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EFFECT OF *ANNONA SQUAMOSA* LEAVES EXTRACT ON SEEDLING AND ROOT LENGTH OF *VIGNA RADIATA* (L)

***Ravindra B. K., N. G. Patil**

Department of P. G. Studies and Research in Botany,
Gulbarga University, Gulbarga-585106, Karnataka, India
*Author for Correspondence: ravindrakeluskar@gmail.com

ABSTRACT

Vigna radiata (L.) is an important pulse crop grown and consumed all over the world. It is good source of protein and carbohydrates. It is commonly known as green gram and is belongs to family Fabaceae. *Vigna radiata* is affected by many diseases, which inhibits growth and productivity of plants, keeping this in view. In the present study we used *Annona squamosa* leaf extract to test the efficacy on seedling and root growth. The green gram seeds collected from local area Kalaburgi, and incubated in moist blotter. After 5 days, per cent germination was calculated and recorded. The result shows *Annona squamosa* was found more supportive in seed germination and seedling growth in green gram.

Key words: Seed born fungi, Allelopathic effect, *Annona squamosa*, *Vigna radiata* (L).

INTRODUCTION

Green gram *Vigna radiata* (L.) is an important pulse crop known as mung. It is grown in Semi irrigated condition as Kharif during the month of June to September. The green gram is grown as sole crop, mixed crop, this crop is grown widely in India, Pakistan, Srilanka, Thailand, Laos, Cambodia, Vietnam, Indonesia, Malaysia, south china, Formosa, Philippines, Taiwan etc,. It is also grown to lesser extent in many parts of Africa, U. S. A., and Australia (Agrawal, 1989). In India, green gram occupies an area of 3.34 million hectares with the total production of 1.06 million tones and productivity of 415 kg per hectare (Anonymous, 2009a). Andhra Pradesh, Madhya Pradesh, Orissa, Maharashtra, Rajasthan, Bihar, Tamil nadu, and Gujarat are the major green gram growing states of India (Anonymous, 2009b), Green gram is nutritious as it contains protein, carbohydrates. It is also contain Calcium, Iron, and potassium (ShakuntalaManay and Shadaksharaswamy, 1987). A disease is one of the major constraints in economic crop production as they inflict heavy losses. Green gram is attacked by many diseases during seed germination to seed production and maturity. More than 35 pathogens such as viral, bacterial fungal and nematodes sps are known to attack green gram resulting into substantial yield losses. (1) Among these, seed born fungal diseases are severing in yield loss and seed quality of green gram. The crop is affected by many diseases such as Anthracnose, leaf spot, Dry rot, and leaf blight. Among these diseases, Cercospora leaf spot, and Mung bean blight are serious diseases inflicting heavy losses (Verma and Sandhu 1992). Seeds chemical treatment is banned or restricted the use of number of highly toxic fungicides, such as organomercurials because of their residual toxicity. Some alternative control methods have been employed. In the present study we used *Annona squamosa* leaf extract to test the effect on seedling and root growth

MATERIAL AND METHODS

Materials:

Green gram seed, leave extract of *Annona squamosa*, Mercuric chloride Etc.

Methodology

Seed Samples Collection:

Vigna radiata (L) (Green gram) seeds (Fig. 1) and Fresh leaves of *Annona squamosa* were collected from general store kalaburgi, and kusnoor respectively. And were transferred in sterilized polythene bag, and then brought to mycology and plant pathology laboratory, for further study.

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(A) *Annona squamosa*

Fig 1: Shows fresh leaves of *Annona squamosa*

Blotter method:

The seeds were sterilized with mercuric chloride and distilled water, placed at equal distance in petriplates contained blotting paper (Fig. 2) to observe seedling, and root growth. The germination percentage of *Vigna radiate* seed were calculated after 5 days of treatment, radical length measured after 24 hrs for 5 days.



Fig 2: Seeds of *Vigna radiata* in blotter

Preparation of leaf extract

Collected sample leaves were surface sterilized, and dried under shade. Dried leaves were cut into small pieces and grinded to powder. 10 gram of each leaf powder boiled in 200 ml of distilled water for 10 minutes then filtered it with whatman No. 1 filter paper. The prepared plant extract solution was cooled at 4° C and stored in laboratory condition (Fig. 3) for further experimental work.



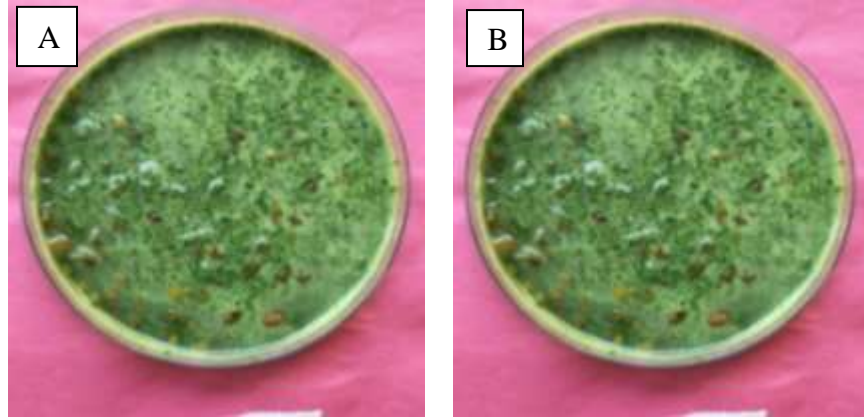
(A) *Annona squamosa* leaf extract

Fig. 3: Shows aqueous leaves extract of *Annona squamosa*

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Plant extracts treatment:

The seeds are soaked in the 5%, 10%. And 15% concentration of *Annona squamosa* leaves extract for four hours in (Fig. 4) Petri plates. And placed in moist blotter and recorded the percentage of seedling and root growth.



(A) 5 % *Annona squamosa* leaf extract (B) 10% *Annona squamosa* leaf extract



(C) 15% *Annona squamosa* leaf extract

Fig. 4: Shows 5%, 10% and 15% aqueous leaves extract of *Annona squamosa*

RESULTS AND DISCUSSION

The results showed that the aqueous leaves extract of *Annona squamosa* was found more supportive in the seedling and root growth in green gram .No fungal growth has been seen on the treated seeds. In all concentrations of *Annona squamosa* leaf extract found positive stimulatory effect on seedling and root growth, in first day no seedling and root germination found in the incubated seeds, in second day it is observed that two seeds were found seedling and root growth. And in third day four seeds were found germinated. Whereas in fourth day it is observed that all incubated seeds were found germinated and their rate of seedling and root growth interpreted in below mentioned table

Germination Test: Number of germinated seeds was noted daily by visual counting.

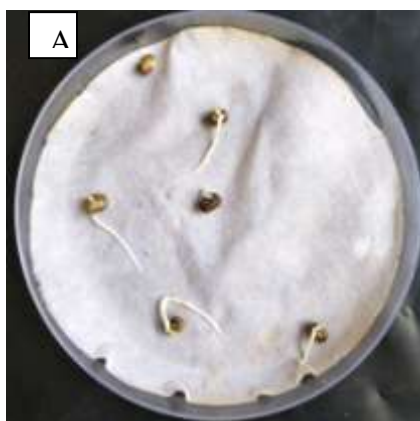
Table no 1: shows Germination of seed and root length of infected seeds in moist blotter.

Days	Room Temperature	Number of seeds germinated	Root length(cm)
1	24 ⁰ c	0	0
2	28 ⁰ c	2	0.2
3	27 ⁰ c	4	0.5
4	28 ⁰ c	6	2
5	27 ⁰ c	6	4

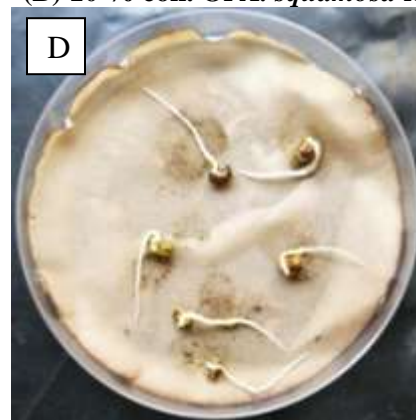
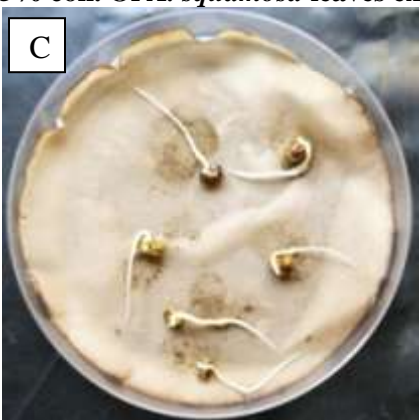
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Table No 2: Shows Number of Seed germination in different concentration of *Annona squamosa* leaves extract.

Days	Seed germination in different concentration of plant extract				
	5%	10%	15%	Plant extract (control)	% of Germination
1	0	0	0	0	0%
2	4 (1 cm)	4 (1 cm)	5 (1 cm)	5 (1.2 cm)	83.3%
3	4 (2.3 cm)	4 (2.8 cm)	5 (3 cm)	6 (3.2 cm)	93.7%
4	4 (3.2 cm)	4 (3.4 cm)	6 (3.4 cm)	6 (3.8 cm)	89.4%
5	4 (4.2 cm)	4 (4.3 cm)	6 (4.8 cm)	6 (5.2 cm)	92.3%



(A) 5% con. Of *A. squamosa* leaves extract (B) 10 % con. Of *A. squamosa* leaves extract



(C) 15% con. Of *A. squamosa* leaves extract (D) *A. squamosa* leaves extract (control)

Fig 5: Shows Seed treatment in 5%, 10 %, and 15% concentration Of *A. squamosa* leaves extract.

Conclusion

Our study concludes that, *Annona squamosa aqueous* leaves extracts have positive response in stimulating seedling and root growth of *Vigna radiate*, and plant extracts also played a vital role in promoting seed germination and root length.

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