

## **Allelopathic effect of leaf extract of different trees on *Vigna radiata* L.**

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**Aim:** To determine stimulatory concentration of leaf extracts of *Artocarpus heterophyllus* Lam. (Jackfruit), *Ficus bengalensis* L. (Banyan), and *Tectona grandis* L. (Teak) for the benefit of germination of *Vigna radiata* L. seeds.

Allelopathy is a natural phenomenon whereby one plant releases a substance which has inhibitory or stimulatory effects on other plants and micro organisms sharing the same habitat (Reigosa *et al.* 2006). In most cases the allelopathic effect is studied with negative angle but at lower concentration of leaf extract stimulative effects are noticed by the earlier workers. Hence we have concentrated our study on searching the exact lower concentrations at which it will be more stimulative so that one can use it as seed pretreatment for increasing the growth rate and hence the yield. We have also tried the different concentrations of soil extracts as well as combinations of (leaf + soil) extract.

### **Procedure:**

- 1) Preparation of extract:
  - a. Leaf extract: Dried leaves of *Artocarpus heterophyllus* Lam., *Ficus bengalensis* L. and *Tectona grandis* L. were collected and fine powder of leaves was made. 10g leaf powder was taken in conical flask containing 100ml water which was kept on shaker for 24hrs. The extract was then filtered and then dilutions of extract were made. The leaf extract was diluted to 8%, 6% and 4% concentration.
  - b. Soil extract: The topsoil under the experimental plants was collected and the extract was made by taking 10g soil in 100 ml water in conical flask followed by 24hrs mechanical shaking. The extract was then filtered. It was diluted to 8%, 6% and 4%.
  - c. Soil and leaf extract: This extract was prepared by adding 5g soil and 5g leaf powder in 100ml water which was placed on mechanical shaker for 24hrs. Then the extract was filtered and diluted to 8%, 6% and 4% concentration.
- 2) Sterilization of petri-plates: The petri plates used for experimental purpose were sterilized by using autoclave.
- 3) Pretreatment of test seeds i.e. Mung (*Vigna radiata* L.): The test seeds were surface sterilized with 0.1% HgCl<sub>2</sub> for 30 seconds followed by washing with distilled water.
- 4) Setting of germination experiment: The sterilized petriplates were lined with filter paper. In each petriplate 25 seeds were placed. In each petri plate 5ml solution of respective concentration i.e. 10%, 8%, 6%, 4% was added. Control was set up using tap water.
- 5) Study of percentage germination and measurement of radicle length: Seed germination % was calculated after 72hrs and radicle length was measured by using scale.

**Inferences:**

**Effect of different concentrations of leaf extract on average radicle length of seedling:**

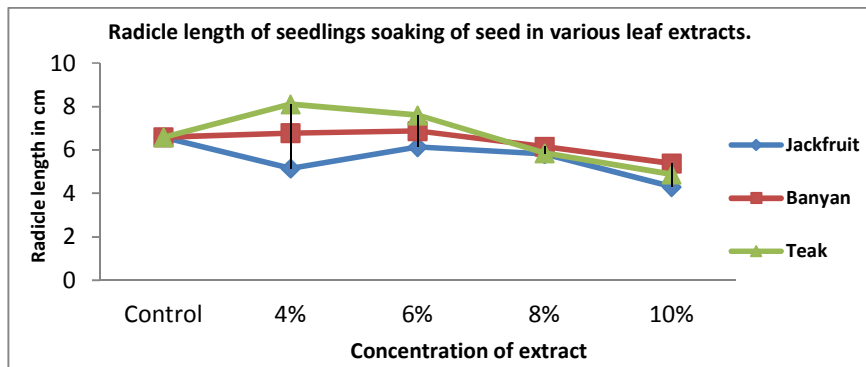
Name	Control	4%	6%	8%	10%
Jackfruit	6.59	5.15	6.14	5.82	4.30
Banyan	6.59	6.78	6.88	6.16	5.38
Teak	6.59	8.11	7.60	5.85	4.88

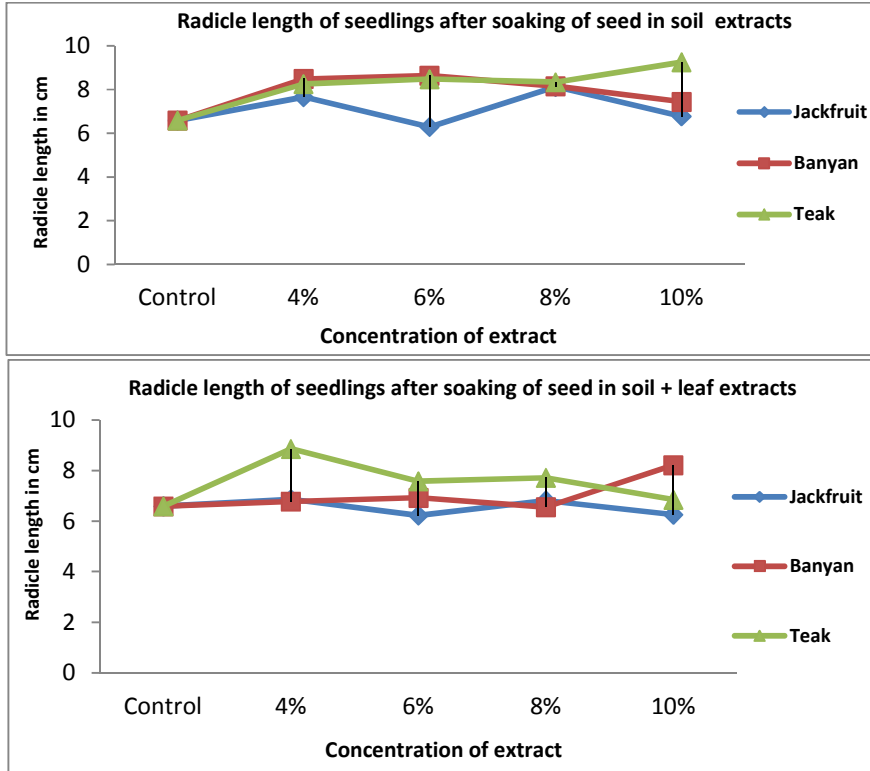
**Effect of different concentrations of soil extract on average radicle length of seedling:**

Name	Control	4%	6%	8%	10%
Jackfruit	6.59	7.66	6.29	8.13	6.78
Banyan	6.59	8.49	8.64	8.16	7.44
Teak	6.59	8.26	8.48	8.34	9.26

**Effect of different concentrations of (soil + leaf) extract on average radicle length of seedling:**

Name	Control	4%	6%	8%	10%
Jackfruit	6.59	6.87	6.23	6.82	6.26
Banyan	6.59	6.78	6.93	6.56	8.22
Teak	6.59	8.86	7.58	7.72	6.85





**Conclusion:**

From the above results we conclude that

- Mung seeds pretreated with Teak extract (leaf, soil and soil+ leaf) showed maximum stimulative effect than that of Banyan and Jackfruit extract.
- Teak leaf (4%) extract, soil (10%) extract and (soil + leaf 4%) extracts are the best concentrations for Mung seed pretreatment.
- Banyan leaf extract (6%), soil extract (6%) and (soil + leaf) extracts (10%) showed stimulatory effect on Mung seed.
- 100% Seed germination was recorded in all treatments.
- For confirmation further field trials are needed.

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