

International Journal of Advanced Research in Science, Communication and Technology

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal

Volume 5, Issue 10, March 2025



# Study of Effect of Some Medicinal Plants on Seeds of *Vigna radiata* With Respect to Biomarker and Biomass Study

Javid V. Khan<sup>\*</sup>, Iqra Kurawle<sup>1</sup>, Rahim A. Bagwan<sup>2</sup>, Firoj Shaikh<sup>2</sup>

\*<sup>1</sup>Department of Zoology, Anjuman Islam Janjira Degree College of Science, Murud Jnajira, Raigad.
<sup>2</sup>Department of Botany, Anjuman Islam Janjira Degree College of Science, Murud Jnajira, Raigad.

Abstract: Some medicinal plants were used by some people those who are suffering from various diseases. Despite their therapeutic advantages, some constituents of herbs are potentially toxic and pose health risks because they can be bought from the market without a prescription. Plants (Chlorophytum borivilianum, Curculigoor chioides and Mucuna prurnies), 2.5%, 1% and 0.5% extracted with water. The allelopathic potentials of the extracts were assessed using seed germination and by measuring plantlets length, chlorophyll content and biomarker were also tested. In present investigation of allelopathic evaluation, the aqueous extracts of tested plants were not cytotoxic. Aqueous extract shows prominent activity, 1% aqueous extract of Chlorophytum borivilianum, were shown to have the most inducing activities on Vigna radiate seeds on comparing with control.

Keywords: Allelopathic, seed germination, chlorophyll, biomarker and Biomass

### I. INTRODUCTION

Agriculture is the science and art of cultivating plants. Traditionally several agricultural as well as medicinal plants were domesticated in India. The secondary metabolites produced by plants showing various effects. There are some plants produce secondary metabolites which provides aphrodisiac effect. The aphrodisiac is defined as an agent (food or drug) that arouses sexual desire crude extract of plants Chauhan (et al. 2014)which have been useful in sexual disorders. It is also helpful in Spermatogenesis and Reproduction. The medicinal effect with Aphrodisiac activity of *Chlorophytum borivilinum* was used for physical illness and to increase general body immunity. Its aphrodisiac properties have proved very much useful for the people suffering from erectile dysfunction and to increase male potency. *Curculigoorchoides* popularly used in treatment of menorrhagia, leucorrhoea, gonorrhea, dysuria and menstrual derangements, jaundice, asthma, piles etc. It is also considered as an effective anti-infective and healing agent. The *Mucuna prurnies* used as Antidepressant drug. It is useful to decrease Prolactin level, also reduce symptoms of Parkinson's Disease and used for treatment of male infertility.

The allelopathic effects of plant on seed germination was studied by Oudhia et al (1998). The aphrodisiac plants have ability to effects on seed germination. The Allelopathic effect of aphrodisiac plants on seed germination as well as changes in seedling plants were studied by *Blumealacera* L.on rice on agricultural crops (Ridenour and callaway 2001 and Cheema: Farooq S: Khaliq, 2012). The effects were assessed using biomarkers. Biomarkers have been defined by Hulka and colleagues as cellular, biochemical or molecular alternations that are measurable in biological media such as human tissues, cell or fluids. Acid phosphatase is example of biomarker. In current investigation we were select *Chlorophytum borivilinumCurculigoorchoides* and *Mucuna prurnies* aphrodisiac plant and to check their allelopathic effect on seed germination of mung bean plant.

Copyright to IJARSCT www.ijarsct.co.in







International Journal of Advanced Research in Science, Communication and Technology

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal

### Volume 5, Issue 10, March 2025



### **II. MATERIALS AND METHODS**

### **Collection of plant material**

The amorphous powder form of root of selected species of medicinal plants *Chlorophytum borivilinum* (*CB*), *Curculigoorchoides*(*CO*) and powder of shoot of *Mucuna prurnies* (*MP*) were collected in the form local herbal medicine market of Jalgaon district, Maharashtra, India.

### **Preparation of plant extract**

Different plants material collected from local market were subjected to prepare aqueous extract. The collected sample of each plant material were mixed with Distilled water in different concentration (0.5, 1.0 & 2.5%). The aqueous suspensions of different concentrations were incubated for 5 hours at  $70^{\circ}$  C. The extracts were filtered through filter paper and take a clear filtrate as aqueous extract.

### Selection of appropriate concentration of plants for seedling growth

The effect of aqueous extract on model plants at different concentration were checked by using common Mug bean (*Vigna radiata*). The seeds of *Vigna radiata* were procured from the local market of Jalgaon district (Maharashtra). Seeds were sterilized in a 0.1% Mercury chloride solution for 10 minutes (USEPA, 1996), rinsed through with deionized water several times. The seeds were sowed in pot tray. Each pot (14 cm diameter and 18cm in height) were filled with fertile loam soil up to <sup>3</sup>/<sub>4</sub> the height of the pot. The different concentration of prepared aqueous extract was supplied to sowed seed of test plantlet for seven days. Control for each were conducted simultaneously using sterile distilled water instead of extract. All the experiment were conducted in triplicate to standardize the result. Seedling and Plant growth being conducted in controlled conditions of temperature ( $25\pm1^{\circ}$ C) illumination (dark/light cycle: 14/10 h.) and 80% humidity into a green-house. Observe the growth at 0, 1, 3, and 5<sup>th</sup> day after 7 day of growth, the shoot and root lengths were long enough to measure using a ruler. Fresh and dry weights were also measured.

### **Estimation of Chlorophyll**

Chlorophyll A, chlorophyll B and total chlorophyll of all aqueous extract treated plants along with the control plant were tested by the method of Stir ban (1985)

### **Protein Estimation at different aqueous concentrations**

Protein content of all aqueous extract treated plants along with the control plant was measured according to Lowery (et al. 1951).

### Acid phosphatase activity

Acid phosphatase activity of aqueous extract of ripe and unripe banana peel treated germinated seeds of *Vigna radiata* was determined according to, (Hussain, 2016), by using the standard para-nitro phenol.

### **III. RESULTS AND DISCUSSION**

### Collection of plant material and extract preparation

The plants part powder collected and its aqueous extract were prepared according to method described in material and methods of different concentrations

## Effect of aqueous extract (0.5, 1.0 & 2.5%) of three medicinal plants on growth of aerial and underground tissues of *Vigna raidata*

The effect of aqueous extract on shoot and root length of mung bean is shown in Fig 1. It was observed that as the concentration of aqueous extract decreases, the shoot and root length was increased. At 2.5% and 1% concentrations the shoot length highest in CB and CO and lowest in MP and root length was found to be highest in CB and MP and lowest in CO. The mung bean shows the best growth response for shoot and root length and it was observed at concentrations of 0.5% of aqueous extract over control. At this lowest concentration, highest growth of shoot length observed in CB and CO, retardation in root and shoot length for mung bean plant treated with MP respectively.







International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal







Fig. 1 (a)

IJARSCT





Fig.1(c) Fig. 1 (a,b,c): Effect of aqueous extract of three aphrodisiac plants atdifferent concentration (a)0.5%,(b) 1%,(c)2.5%



Estimation of Total dry Weight.



**Copyright to IJARSCT** www.ijarsct.co.in







International Journal of Advanced Research in Science, Communication and Technology

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal

### Volume 5, Issue 10, March 2025



Concentrations%	Group	Total chlorophyll (mg/gm)	Chlorophyll A (mg/gm)	ChlorophyllB (mg/gm)
0.5	Control	0.05082	0.0049	0.0031
	СВ	0.01690	0.0071	0.0049
	СО	0.01632	0.0070	0.0091
	MP	0.0160	0.0073	0.0085
1.0	Control	0.05082	0.0049	0.0031
	СВ	0.01193	0.0077	0.0040
	СО	0.0125	0.0076	0.0046
	MP	0.0133	0.0076	0.0056
2.5	Control	0.05082	0.0049	0.0031
	СВ	0.01819	0.0096	0.0083
	СО	0.0152	0.0089	0.0062
	MP	0.01835	0.0095	0.0086

Chlorophyll content measure in mg/gm

Table 1- Chlorophyll content of Vigna radiata treated with aqueous extract of different concentration of some aphrodisiac plants.

### Protein content in leaves of mung bean under different treatment

The protein content of treated plant leaves of mung bean is given in Fig 3. The highest protein content was found in CB and CO and lowest in MP plant.



Fig 3-Total protein content of leaves plantlet of Vigna radiata treated with aqueous extract of Aphrodisiac plants. (Biomarker) Acid phosphatase activity

Comparative account on (Biomarker)Acid phosphatase activity in germinated Vigna radiata seeds on seven day after treatment with three plants aqueous extract

**Copyright to IJARSCT** www.ijarsct.co.in



DOI: 10.48175/IJARSCT-24714



74



International Journal of Advanced Research in Science, Communication and Technology

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal



Volume 5, Issue 10, March 2025

Impact Factor: 7.67

Sr. no	Parameter	total activity	Enzyme	Specific activity
		(µM/ml)	activity(µM/ml/min)	(µM/ml/min/mg)
1	Control	4.72	11.8	36.99
2	СВ	9.85	24.6	65.07
3	СО	4.40	11	29.89
4	MP	4.15	10.3	28.37

Table 2: Acid phosphatase activity in germinated *Vigna radiata* seeds on seven day after treatment with three plants aqueous extract

In table 2, it was observed that specific activity of acid phosphatase was highest in CB as  $65.07\mu$ M/ml/min/mg, moderate specific activity was observed in CO as  $29.89\mu$ M/ml/min/mg, while lowest specific activity was observed in MP as  $28.37\mu$ M/ml/min/mg.

### **IV. DISCUSSION**

In current investigation, on the basis of literature survey, we were selected some aphrodisiac plants to check their stimulation or inhibitory effect on germinating seeds of (Vigna radiata) as a model Srinive (2007). The underground part of chlorophytum borivilinum, Curculigoorchiods (Hypoxidaceae) and seed of Mucuna prurnies (Fabaceae) are taken for present investigation. We found that percentage of germination is highest in tested plant treated with (CB, CO,MP) as 100% followed by CB 90%, MP as 80% respectively while in CO less growth was observed. Dry weights were found to be more with shoot & root lengths for Corresponding different concentrations treatment. As the Concentration of extract increases the biomass in the form of dry weight increases, mung bean showed increase in dry weight of root as well as shoot over. Control study reveals at lower concentration of extract less biomass from (root& shoot) over untreated plant similar observations given by various authors, Ishii; Yoshikawa, Minakata, Komura & Kada (1984) & Bhattacharjee (2008). It is interesting to note that not a single reference occurred in literature indicating Allelopathic effect of aphrodisiac plants in seed germinating and growth however in other plants change in germination however, Allelopathic effect in mung is reported by using BlumealaceraL.on rice on agricultural crops (Ridenour and callaway 2001 and Cheema: Farooq S: Khaliq, 2012). Chlorophyll is one of the major chloroplast components for photosynthesis Rahdari (et al.2012). The decrease in chlorophyll content under drought stress has been considered a typical symptom of pigment photo oxidation and chlorophyll degradation Anjum (et al. 2011). The effect of aqueous extract on chlorophyll content (chlorophyll a, chlorophyll b, total chlorophyll and carotenoids) of mung bean (Vigna radiata) shows that are highest total chlorophyll in 0.5% and 2.5% concentrations of extract evidenced in CB. Also highest protein content was noticeable as increases in CB 18% lowest in MP 13% and moderate protein in CO 16%. But Amira (2001) studied effect of salt stress on plant growth and metabolism of bean plant Vicia faba. Biomarker is used to check out the provided treatment is beneficial or harmful to the plants acid phosphatase biomarker are used in this Vigna radiata. The highest concentration of acid phosphatase observed in CB plants. CO is less than MP plants. We found the aqueous extract of three aphrodisiac plant at 0.5% and 1% concentration by standard deviation showed statistically significant stimulation on shoot and root elongation of the tested plant CB,CO and MP (mung bean).

### **V. CONCLUSION**

On the basis of our results, it was found that all the suitable plants such as CB, CO, MP. The result indicates that positive response in growth of CB. The length of shoot of seedling is more than control evidence chlorophytum is best. Among three more induction of synthesis of acid phosphatase during the treatment of CB, more positive response was obtained concomitantly in addition to morphological study. We observed positive biochemical changes during the treatment of germinated seed. Biochemical parameters like protein & chlorophyll also increased than control seedling. The response is best in CB, moderate in CO & good is MP.

Copyright to IJARSCT www.ijarsct.co.in







International Journal of Advanced Research in Science, Communication and Technology

International Open-Access, Double-Blind, Peer-Reviewed, Refereed, Multidisciplinary Online Journal



#### Volume 5, Issue 10, March 2025

### REFERENCES

- [1]. Amira M.S, Abdul Qadas, Effect of salt salt stress on plant growth and metabolism of bean plant Vicia faba (L.),Vol 10, Issue 1,2011,7-15.
- [2]. Bhattacharjee S (2008). Triadime fon pretreatment protects newly assembled membrane system and causes up - Regulation of stress proteins in salinity stressed Amaranthus lividus L. during early germination.J. Environ.Biol., 29,805 – 810.
- [3]. Cheema ZA,Farooq M,Khaliq A. Application of Allelopathy in crop production: success story from Pakistan .In: Allelopathy: Current tradends and future Applications 2012; 113-143.
- [4]. Cheema ZA, Khaliq A, Mubeen M. Response of wheat and winter weeds to folior applications of different plant water extracts of sorghum (sorghum bicolor) Pakistan Journal of Weed Science Research. 2003;9:89-97.
- [5]. Ishii, R., Yoshikawa, H., Minakata, N.T., Komura, K.& Kada, T.(1984).
- [6]. Khaliq A, Matoob A, Irshad MS, Tanveer A, Zamir MSI.Organic weed management in maize through integration of allelopathic crop residues. Pakistan Journal of Weed Science Research.2010; 16:409-420.
- [7]. Lowery OH, Rosebrough NJ, Farr AL, Randall RJ (1951). Protein measurement with the folin phenol reagent. Jour. Biolog.Chemistry,193:265-275.
- [8]. Muller CH. 1969. Allelopathy as a Ridenour, WM and RM Callway.2001.
- [9]. Oudhia P, Kolhe SSS, TirpathiRS. Allelopathic effect of Blumealacera L(1998), on rice and common Kharif weeds. Oryza, 35: 175-177.
- [10]. Mayank Thakur, Paul connellan, Myrna A. Deseo, Carol Morris and Vinod K. Dixit(2011). Immunomodulatory Polysaccharide from chlorophytum borivilinium Root, 598521.
- [11]. K Janardhan, Vadivel Vellingiri, M. Pugalenthi(2003) International journal of food Science and Nutrition, 51(4):279-87.
- [12]. Elferink JG, Aphrodisiac use in pre-columbian Aztec and Inca cultures, J Hist Sex 2000
- [13]. Ramandeep Singh (2013), Indian medicinal plants with Aphorodisiac potential Vol2, Issue Pages 13-21.
- [14]. Nagendra Chauhan, Vikas Sharma, V.K.Dixit (2014), plants used for improvement of sexual performance and Virility Vol (2014), Id 868062, pages 19.
- [15]. Neelesh Malviya, Anil Kharia, Ankur Joshi, Narendra Vyas (2016) journal of drug delivery and therapeutics;7 168-169
- [16]. Randhir R, lin Y-T, shetty K : Stimulation of phenolics, antioxidant and antimicrobial activities in dark germinated mung bean sprouts in response to pepetide and phytochemical elicitors process Biochem 2004, 39:637-64



