

An experimental study on efficacy of Kalium phosphoricum 6x, 30c and 1m potencies on germination of vigna radiata using quantitative and qualitative assessment of germination parameters

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ABSTRACT

This article presents an experimental study conducted to investigate the efficacy of different potencies of Kalium Phosphoricum on the germination and growth of Vigna Radiata (Green gram) seeds. The study aimed to determine the impact of Kalium Phosphoricum on seed germination, compare the growth differences among different potencies, and identify the most effective potency for plant development. The methodology involved soaking the seeds in various potencies, followed by the cotton pad germination method. The germination parameters were assessed quantitatively by calculating the percentage of germination, and qualitatively by measuring shoot and root lengths. The results demonstrated that Kalium Phosphoricum potencies had a significant effect on seed germination and growth, with the most effective potency observed to be 6X.

Key words: Agrohomeopathy, Kalium phosphoricum, Vigna radiata, Germination percentage, Coefficient of allometry

Dr. Christian Friedrich Samuel Hahnemann opened up a whole new line of treatment, Homoeopathy. 200 years ago, he wrote: “**heal as gently and safely as possible**”. Homoeopathy is a system of treatment widely spread all over the world. Homoeopathic medicines are proved to be effective in both human beings and animals. The homoeopathic practice is based on the seven cardinal principles. Among these the most important is the theory of Drug Dynamization. The homoeopathic potentised medicines consist of highly diluted natural substances.

Recently many studies have claim that homoeopathic medicines are highly effective in the growth of plants and their yield. They are also found to be effective in the treatment and prevention of diseases of plants. This branch of homoeopathy dealing with plants is known as ‘AGRO-HOMOEOPATHY’ [1]. Homoeopathic medicines fill in as an option for fertilizer and treatment of plants due to its none

harmfulness. It fills in as a superior substitute to pesticides and counterfeit fertilizer which produce numerous wellbeing perils in individuals and creatures. A homoeopathic drug enhances the sound development of plants just as they improve the quality and amount of agrarian creation.

Significant advantages of agro-homoeopathy incorporate financial reserve funds and protection of the regular nature. Agro-homoeopathy can lessen costs from agrochemicals and it won’t harm the life form, the ground under the plant or its encompassing zone and the water. Agro homoeopathy in the natural climate is innocuous for the client. It is unfeeling to utilize agrochemical particularly pesticides which as often as possible causes some awful impacts and even passing. Agro-homoeopathy and homoeopathic potencies don’t defile land or individuals and assists with supporting recovery of the environment. The ground on which the potencies are applied is not at risk of

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increasing its salinity; the potencies do not injure micro flora and fauna, or the aquifer mantles. Agro-homoeopathy can also reverse the damage already present in the ground because of the use of excessive fertilizers or pesticides, or excessive salinity [2].

Although human subjects have been utilized to show the legitimacy of homoeopathy, mainstream researchers remain incredulous that homoeopathy does, indeed, work. The use of plant models allows the observations of direct responses, while eliminating the subjectivity and speculation with regard to placebo effects which are the main criticism when human subjects are used [3]. Chemical name of Kalium phosphoricum is phosphate of potassium or potassium phosphate with chemical formula KH_2PO_4 . Potassium is an essential macronutrient required for plant growth and development. Its deficiency affects many essential physiological and metabolic processes [4]. Phosphorus is essential for the general health and vigor of all plants. Some specific growth factors that have been associated with phosphorus are stimulated root development and increased stalk and stem strength [5]. Phosphate is the ‘fuel’ of the plant as it traps the sunlight energy into chemical energy that is then used by the plant for many metabolic processes. Potassium is associated with many processes including nutrient movement and redistribution around the plant and water management. Hence this study was done to demonstrate the move and impact of homoeopathic medication Kalium phosphoricum on germination of seeds and its development in various potencies.

Study Design

Experimental research design

Table 1: Percentage of Germination

Treatment	Number of seeds germinated(n) on first day	Percentage of germination 100(n/N) on first day Where N=10	Number of seeds germinated(n) on third day	Percentage of germination 100(n/N) on third day Where N=10
Distilled water	6	60%	10	100%
Kalium phosphoricum 6X	9	90%	10	100%
Kalium phosphoricum 30C	6	60%	10	100%
Kalium phosphoricum 1M	7	70%	10	100%

Table 2: Percentage of Germination

GROUP		Paired differences		Z	P
		Mean	Std. Deviation		
Distilled water	Percentage of germination100(n/N)	-26.67	5.774	1.633	.102 ns
Kalium phosphoricum	Percentage of germination100(n/N)	-21.83	12.002	6.513	<0.001 vhs

METHODOLOGY

The study utilized Vigna Radiata (green gram) seeds and Kalium Phosphoricum potencies of 6X, 30C, and 1M. Good quality seeds were selected, and equal weights of seeds were randomly chosen for the experiment. The seeds were soaked overnight in the respective potencies and distilled water (control). The cotton pad germination method was employed, and growth indicators such as shoot length, root length, and germination start were measured. The data collection and analysis were conducted using statistical methods, including the calculation of germination percentage and coefficient of allometry that is L_s/L_r where L_s is shoot length and L_r is root length.

Statistical Measures

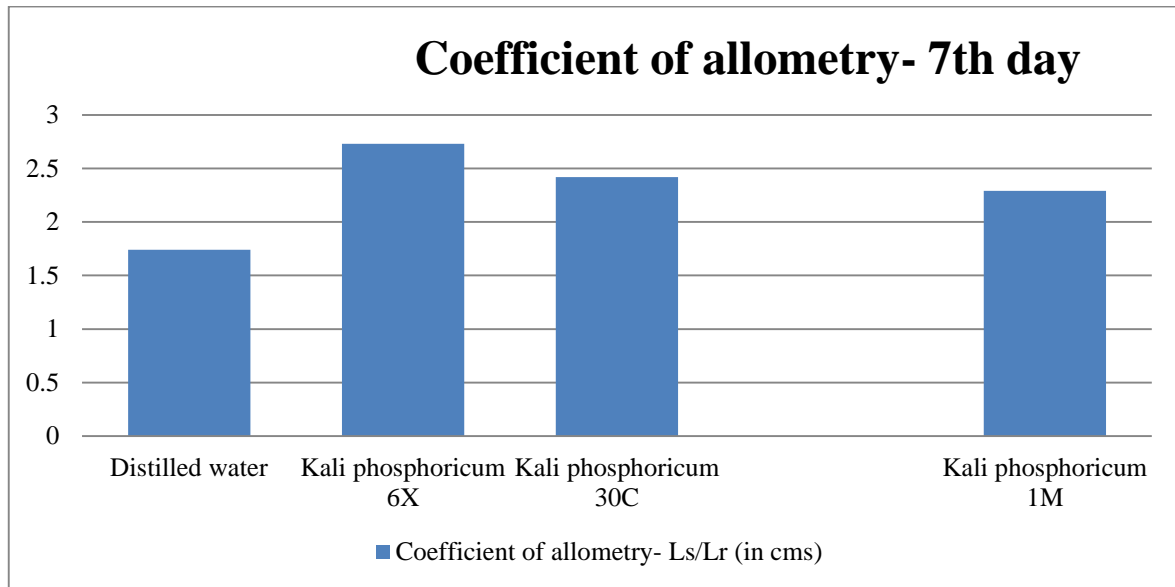
Percentage of germination- Student t test
Coefficient of allometry- One Way ANOVA

RESULTS

The results of the study indicated significant effects of the Kalium Phosphoricum potencies on the germination and growth of Vigna Radiata seeds. The percentage of germination progressively increased over the observation period, with all potencies showing higher germination rates compared to the control (distilled water). Statistical analysis revealed significant differences in the number of seeds germinated between the treated groups and the control group on the third day. Additionally, the coefficient of allometry, which measures the relationship between shoot length and root length, indicated greater growth in the Kalium Phosphoricum-treated groups, particularly the 6X potency.

Table 3: Coefficient of Allometry- 7th Day

Treatment	Shoot length- Ls (in cms)	Root length – Lr (in cms)	Coefficient of allometry- Ls/Lr (in cms)
Distilled water	11	6.3	1.74
Kalium phosphoricum 6X	34.2	12.5	2.73
Kalium phosphoricum 30C	23.3	9.6	2.42
Kalium phosphoricum 1M	25.2	11	2.29



Graph 1: Graph of coefficient of allometry- day 7

Table 4: Coefficient of Allometry

Treatment	N	Mean	Std.Deviation	H	P
Shoot Length Distilled water	3	4.4667	.05774	16.416	.001 vhs
Kalium phosphoricum	60	11.1267	2.35292		
Root Length Distilled water	3	3.57	.115	14.772	.001 vhs
Kalium phosphoricum	60	6.37	.805		
Coefficient of allometry Distilledwater	3	1.2800	.00000	14.703	.001 vhs
Kalium phosphoricum	60	2.0077	2.05699		

DAY 1

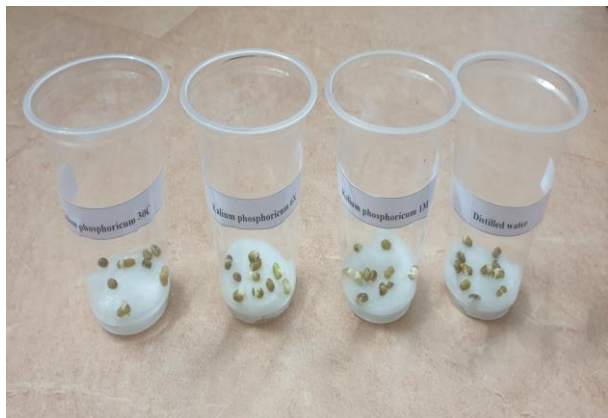


Figure 1: Day 1 of experiment

DAY 7



Figure 2: Day 7 of experiment

DISCUSSION

Germination percentage: The first phase of the present study was to understand the role of potentised kalium phosphoricum on seed germination. Seeds were presoaked with treatment solutions and sown on next day. On first day there was no cent percent germination. (Table no. 1). On second day seeds treated with Kalium phosphoricum 6X, 30C, 1M has cent percent germination while in distilled water germination percent was less. (Table no. 2). On third day there was 100% germination in all treated groups except distilled water. Which has only 90% germination. On statistical analysis, on 1st and 2nd day the number of seeds germinated was not significant while on 3rd day it was highly significant.

Germination start: It is the interval between seed sowing and beginning of germination. In all the treated groups, germination start was one day. There are no significant variations.

Coefficient of allometry: The shoot length and root length was measured on 7th day. Maximum shoot and root length was observed in Kalium phosphoricum 6X whereas minimum in distilled water. On statistical analysis of shoot length of Kalium phosphoricum potencies H- 16.416 and $p < 0.001$, root length of Kalium phosphoricum potencies H- 14.703 and $p < 0.001$ which are highly significant. In groups treated with distilled water there is no significant variations in growth. This statistical analysis clearly shows that homoeopathic potencies of Kalium phosphoricum has action and effect on growth of vigna radiata. Kalium phosphoricum 6X demonstrated more impact on seeds germination and growth than the other potencies probably because other potencies were dynamized with alcohol which might have hindered their action on the plants. Hence distilled water showed more effects than the higher potencies.

CONCLUSION

In conclusion, the experimental study demonstrated the significant action and effect of Kalium Phosphoricum potencies on the germination and growth of Vigna Radiata. The potencies exhibited a stimulating effect on seed germination, resulting in higher germination percentages compared to the control group. Furthermore, the Kalium Phosphoricum 6X potency demonstrated the most pronounced impact on the growth of the seeds. These findings contribute to the growing body of evidence supporting the efficacy of homoeopathic potencies in plant systems and highlight the potential of agro-homoeopathy as a safe and sustainable approach to enhance plant growth and agricultural.

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