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EFFECT OF COPPER SULFATE AND VITAMIN-E ON SEED GERMINATION

Nannapaneni Madhavi*, Indupalli Rajitha

P.G. Department of Chemistry, J.K.C. College, Guntur, A.P., India.

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For Correspondence:

Dr. N. Madhavi

Head of the Department

P.G. Department of Chemistry,

J.K.C. College, Guntur,

A.P., India.

E-mail:

madhavijkcchempg@gmail.com

ABSTRACT

This study is aimed to evaluate the role of copper sulfate and vitamin-E on seed germination. The increase of concentration of copper sulfate solution retards the germination rate in case of Bengal gram and Green gram. When compared to simple copper sulfate solution, with the addition of vitamin-E enhanced seed germination is observed. This study concludes that it is necessary to select pesticides with no copper and presoaking of seeds in vitamin-E solution that increases the seed germination rate.

INTRODUCTION

Chick pea and Mung bean seeds are protein rich food items.They contain B_1,B_2,B_3,B_6,C and E vitamins also.The trace elements like calcium,iron,magnesium,potassium and zinc are present in them. Tocopherols are accumulated by seeds which are lipophilic antioxidants(1-3).The soil may get polluted with many heavy metals and it leads to less crop production(4-6). Hence the soil must be analyzed before sowing of seeds and the seeds are presoaked in certain solutions inorder to get good yields.Toxic metal contamination of soil in fields increases threat to agriculture. So it is necessary to analyze the soil for effective crop production (7-11).

MATERIALS AND METHODS

All the reagents used in this study are of analytical reagent grade. The seeds of Green gram and Bengal gram are obtained from Guntur local market. To study the impact of copper sulfate on germination of seeds of Green gram and Bengal gram,the seeds are sterilized in 5% sodium hypo chlorate solution for 10 minutes in order to avoid contamination by fungi. Then these seeds are washed with deionized water. In a petri plate 20 sterilized uniform seeds were placed on a Whatmann filter paper using forceps. Then these filter papers were moistened by adding 10 ml of the six treatment solutions.The plates were covered with lids and kept at room temperature. The germinated seeds were counted daily.

Germination percentage= (No. of germinated seeds /Total No. of seeds sown) × 100

RESULTS

The results reveals that there is increase of seed germination percentage with time. With increase of copper sulfate concentration there is retardation of percentage of seed germination. With the addition of vitamin-E along with the copper sulfate, marked increase in percentage of seed germination is noticed.

S.NO	Concentration of Copper Sulphate mg/L	Germination Percentage								
		Bengal gram			Green gram			$CuSO_4$ + Vitamin-E (green gram)		
		D1	D2	D3	D1	D2	D3	D1	D2	D3
1	1000	45	80	80	35	35	35	90	95	100
2	1250	35	45	55	40	50	50	80	85	95
3	1500	45	60	65	15	20	20	65	75	95
4	1750	30	60	60	25	25	25	75	75	95
5	2000	40	40	45	25	30	30	40	60	60
6	2250	20	20	20	15	20	20	35	55	55

DISCUSSION

Heavy metals are essential for growth and metabolic activities of plants.But higher metal concentrations show adverse effect on plant growth.Lower concentrations of copper sulfate increases the seed germination percentage.Further increase in copper sulfate concentration may cause to total failure of germination of seeds.Vitamin-E is lipid soluble in nature. Marked change in germination percentage is observed when vitamin-E is added to the copper sulfate solution.

CONCLUSION

This study reports that higher concentrations of copper sulfate retards the seed germination. So care must be taken for good yields of crop production by checking whether the pesticides may contain copper metal. When tocopherols are added to copper sulfate solution the seed germination was stimulated.

Bengal gram Green gram

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