

Micronutrients effect on soil enzyme activity and growth of *Vigna radiata*

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SUMMARY

Effects of metals such as Cu, Zn, Mn and Fe have been studied by growing the seeds of *Vigna radiata* under different concentrations of sulphate salts. These metals play a significant role in the growth of *Vigna radiata* and soil enzyme activity of amylase and cellulase. It was found that higher concentration of these metals significantly altered the growth of *Vigna radiata* and soil enzyme activity.

Key Words : Amylase, Cellulase, Micronutrient, Soil enzyme activity, *Vigna radiata*

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Different studies undertaken on soil plant physiology reveal that micronutrients play an important role on the growth of *Vigna radiata* and soil enzyme activity. It has been observed that soil enzyme activity is directly related to the soil health. Soil enzyme activity is indirectly proportional to the activity of growth of microorganisms in rhizosphere. Soil health refers to the biological, chemical and physical features necessary for long term sustainable agriculture productivity with minimal environment impact.

There are several indicators of soil health that can be measured by different methods. Several enzymes are known to be present in the soil which catalyzes the organic matter. Soil enzymes are mainly of fungal (Ex: *Trichoderma viride*

and *Trichoderma* spp.) and bacterial (Ex: *Azetobacter* spp. and *Rhizobium* spp.) origin. The enzymes most often found in soil are dehydrogenase, catalase, phosphatase, pectinase, protease and urease.

The main focus is on effects of enzyme activity of amylase and cellulase and growth of *Vigna radiata* in presence of different concentrations of Cu, Fe, Zn and Mn in this research study.

The study determines the soil enzyme activity of cellulase and amylase, observing the growth of plant on the basis of their germination rate, development of leaves and the physical appearance of the plant.

MATERIALS AND METHODS

Experimental materials:

Healthy seeds of *Vigna radiata* were obtained from Krishi vigyan Kendra at Ganpat University, Kherva, Dist. Mehsana, Gujarat. The seeds were sown in the bags containing the soil taken from KVK nursery, Ganpat University. The study was conducted at the end of July to the 1st week of August. The salts used were CuSO₄, MnSO₄, ZnSO₄ and FeSO₄. All salt solutions were prepared in distilled water.

Experimental protocol :

Micronutrient effect on growth of Vigna radiata :

Firstly the soil was filled in the plastic bags and then seeds were sown in each bag containing 15 seeds. Each bags

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