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Cuprum Sulphuricum - a homeopathic drug can combating toxic effect of Cu, promote seed germination and peroxidase activity in *Vigna unguiculata*

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Introduction: Cupper (Cu) is an essential trace element for all living organisms including plants. But high concentration of Cu can cause toxic effects due to its redox properties and can catalyze free radicals, such as reactive oxygen species and peroxide compounds. Though, some plants can tolerate heavy metal may be range from exclusion, inclusion and accumulation of heavy metals depending on the plant species. The present study was performed to see the effect of *$CuSO_4$ 200c* on seed germination of *Vigna unguiculata* in different Cu concentration.

Materials and Methods: The 0, 50, 100, 150, 200, 250 and 300 ppm copper sulphate solutions were prepared. *Vigna unguiculata* seeds were grouped in three (hundred seeds in each group) and allowed to germinate in Petri dish having whatman no.1 blotting paper soaked with different concentration of copper sulphate solutions. Before that the seeds were sterilized and tetrazolium test was also performed. In group I and II the seeds were soaked in *$CuSO_4$ 200c* and *Ethanol 200c* respectively for 3 hours before allowed to germinate in different concentration of Cu solutions. The third group treated as control and allowed to soak in sterile water for 3hrs. The Petri dishes were incubated in room temperature

$CuSO_4 .5H_2O$ was dissolved in 1ml sterile water mg/ml. This solution then mixed with 90% ethanol in equal volume and treated as mother potency. From this, by succussion 200 potency was made and in same way by succession of 90% ethanol, *Ethanol 200c* was made. Each potency thus prepared was mixed with sterile water 1:100 before use.

The growth parameters like weighed, length of germinating axis were observed after 24 h, 48 h and 72 h. Water uptake percentage were recorded. Total protein, chlorophyll, soluble and insoluble sugar were measured by following standard laboratory protocol.

The activity of peroxidase was determined using guaiacol as a substrate following to Kochhar *et al.* 1979.

Results and Discussions: In all the parameters observed *$CuSO_4$200c* treated seeds showed significant changes as compared to control and *Ethanol 200c* as the Cu conc. increases. Thus we can assume from the result that higher conc. of Cu causes toxic effect to the tissue which can be checked by pre-treating the seeds in *$CuSO_4$ 200c* drug solution. This is perhaps the first time report towards combating against soil pollution due to heavy metal toxicity.

Keywords: $CuSO_4$, peroxidase activity, *Vigna unguiculata*, seed germination

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