RESEARCH PAPER:

Effect of mercuric chloride on the morphometrical and biochemical changes of *Arachis hypogaea* (L.) varieties VRI-3 and VRI-5

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SUMMARY

The present work deals with the morphometrical and bio-chemical changes on the effect of mercuric chloride on *Arachis hypogaea* varieties VRI-3 and VRI-5.The different concentrations (0,10,25,50,75,and 100 ppm) of mercuric chloride solutions were prepared and used for field studies. Various morphometrical parameters and bio-chemical changes were analysed on the 55th day after sowing. The morphometrical parameters like root length, shoot length, number of leaves, number of root nodules showed a decreasing trend with increase in mercuric chloride concentrations. The minimum value was recorded at 100 ppm in both the varieties (VRI-3 and VRI-5). The maximum values of these parameters were recorded in VRI-3 and minimum values were recorded in VRI-5. The 55th day plants were collected from research field and analysed for the bio-chemical studies at Ecology Research Laboratory, Annamalai University. Reduction in chlorophyll 'a', chlorophyll 'b' and total chlorophyll contents and metabolites like sugars and amino acids were recorded at higher concentrations level. The minimum value of biochemical contents were recorded at 100 ppm in both VRI-3 and VRI-5 varieties. The maximum value of bio-chemical contents recorded at control level both VRI-3 and VRI-5 varieties. The bio-chemical contents for the VRI-3 variety showed maximum values and minimum values were recorded in VRI-5 in all concentrations. From the final conclusion of cultivars, VRI-3 variety was highly tolerant and VRI-5 variety was highly susceptible according to morphometrical and biochemical contents under mercuric chloride treatment.

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Mercury compounds enter natural water during chlor-alakali production, seed dressing exposure to mercury ore (cinnabar) leaching and washing of mercury from soils and rocks and also washing of the atmosphere by rain water. Mostly in the world, mercury is present by the bedrock and deep sea sediment. In Tamil Nadu, many chlor-alkali factory, aluminum factory and mercurial compound factory are situated closed to river Cauvery. The discharge of the effluent of the above factories mixes with river water. The polluted water is used for irrigation for cultivation of land and drinking purposes.

Kurland *et al.* (1960) and Johnels and Westmark (1969) found that chlor-alkali industry is one of the most important sources of mercury pollution to the aquatic environment. High concentration of mercury produces visible injuries in plant like chlorosis, necrosis etc. Mac Lean (1974) reported that the use of mercurial fungicides resulted in the accumulation of mercury on the soil upto 317 mg/g and in plants 36 mg/g.

Stratton *et al.* (1979) studied to effect of mercury on the photosynthesis of *Anabaena inaequalis*. They reported that 2 ppm and 10 ppm mercury concentration required to inhibit photosynthesis. Paivoke (1983) reported that the total nitrogen content decreased with increasing concentrations of lead and arsenate in *Pisum sativum*. All growth inhibitory concentration of copper was found to increase the alkali soluble protein and protease activity in the embryo and endosperm of rice seeds. Zinc was found to alter the chlorophyll contents in groundnut, Paivoke (1983 b), mercury, Rai and Khatonier (1980), mercury and zinc, by Rai *et al.* (1979), mercury by Mhatre and Chaphekar (1984).

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