

Effect of rhizobacteria on seed germination

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The rhizosphere is a zone of increased microbial activity and biomass at the root-soil interface that is under the influence of the plant root. Effects of rhizosphere organisms can be beneficial, harmful and neutral or variable. Effects of rhizobacterial genera on plant seed germination and the effect of soaking time on seed germination were studied with three bacterial species such as *Pseudomonas*, *E. coli* and *Bacillus* sp. and seeds of *Phaseolus vulgaris* L., *Vigna sinensis* L., *Hibiscus esculentus* L. and *Beta vulgaris* L.. Bacterial inocula were prepared; pellets were separated by centrifugation and suspended in sterile phosphate buffer separately. Surface sterilized seeds were soaked in inocula and allowed to bacterize. At time intervals equal number of seeds were transferred into sterile petridishes containing sterile moisten filter papers. Plates were incubated and the number of seeds germinated and lengths of germ tubes were measured. Results were analyzed statistically by significant "t" test at $p = 0.05$ with controls and there was a significant difference in the mean length of germ tubes of bacterized seeds when compared with control at $p = 0.05$. Germination of *Hibiscus esculentus*, *Phaseolus vulgaris* and *Vigna sinensis* seeds were promoted by *E. coli* and *Pseudomonas*. But *Bacillus* sp. had no effect on the germination of these seeds. Germination of *Hibiscus esculentus* and *Phaseolus vulgaris* seeds could be promoted in an optimized manner by bacterization with soaking in *E. coli* for 10 minutes and 20 minutes respectively where as seeds of *Vigna sinensis* could be promoted by bacterization with soaking in *Pseudomonas* for 20 minutes. Promotion of germination by bacterization was not possible in *Beta vulgaris* and this may be due to low colonization rate of rhizobacteria and the internal seed coat property. *Bacillus* sp. had no effect on seed germination. Minimum soaking time was found out to save the time. Rhizobacterial promotion of seed germination is an important role in plant growth. Very large scale multicentre studies should be done to find out the effect of variety of rhizobacteria on the germination of different plant seeds in order to promote germination and to determine the minimum time needed for bacterization to get optimum promotion.

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