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REVIEW

Alleviation of abiotic and biotic stresses in crops through beneficial rhizospheric bacteria

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Plants do not live in isolation but constantly interact with an array of microorganisms in the soil and in the atmosphere. This interaction is again affected by various environmental factors, and when the environmental conditions become unfavourable they impose different stresses on the plant. With increasing urbanization and population leading to adverse conditions such as extremes of temperatures, water deficit, salinity, increase of heavy metal pollutants in the soil ways and means are now being sought to make plants more resilient. Use of beneficial microorganisms with multiple traits not only for plant growth promotion and disease reduction, but also for alleviation of abiotic stresses is now being considered. Plant growth promoting rhizobacteria(PGPR), endophytic bacteria and other beneficial bacteria including those responsible for biocontrol are being evaluated for such multiple uses in sustainable agriculture. Such bacteria mainly act by mechanisms which reduce the effects such as oxidative stress or cellular metabolic disruptions brought about by different stresses. The various beneficial plant microbial interactions which lead to amelioration of abiotic stresses as well as promotion of growth in plants have been discussed here and along with the various mechanisms involved in the observed beneficial effect.

Key words: Abiotic Stress; biotic Stress; rhizophere bacteria; defuce enzymes; oxidative burst