Halotolerant Rhizobacteria Pseudomonas pseudoalcaligenes and Bacillus subtilis Mediate Systemic Tolerance in Hydroponically Grown Soybean (Glycine max L.) Against Salinity Stress.

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Abstract: Salt stress is one of the devastating factors that hampers growth and productivity of soybean. Use of Pseudomonas pseudoalcaligenes to improve salt tolerance in soybean has not been thoroughly explored yet. Therefore, we observed the response of hydroponically grown soybean plants, inoculated with halotolerant P. pseudoalcaligenes (SRM-16) and Bacillus subtilis (SRM-3) under salt stress. In vitro testing of 44 bacterial isolates revealed that four isolates showed high salt tolerance. Among them, B. subtilis and P. pseudoalcaligenes showed ACC deaminase activity, siderophore and indole acetic acid (IAA) production and were selected for the current study. We determined that 10^6 cells/mL of B. subtilis and P. pseudoalcaligenes was sufficient to induce tolerance in soybean against salinity stress (100 mM NaCl) in hydroponics by enhancing plant biomass, relative water content and osmolytes. Upon exposure of salinity stress, P. pseudoalcaligenes inoculated soybean plants showed tolerance by the increased activities of defense related system such as ion transport, antioxidant enzymes, proline and MDA content in shoots and roots. The Na⁺ concentration in the soybean plants was increased in the salt stress; while, bacterial priming significantly reduced the Na⁺ concentration in the salt stressed soybean plants. However, the antagonistic results were observed for K⁺ concentration.

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Publications: α-Alkoxyalkyl Triphenylphosphonium Salts: Synthesis and Reactions
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