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Effect of Silicate Solubilizing Bacteria *Pseudomonas psychrotolerans* CS51 Treatment on Soybean Crops at Paddy Soil

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[Introduction]

The earth crust consist huge amount of silicon that are unavailable for plant uptake. Due to change in diet habits of human, the consumption of rice has been reduced, whereas, demand of soybean has been elevated in South Korea. Therefore, the current study focused to investigate the adaptation of soybean in paddy field soil through eco-friendly approach to make silicon available for plant uptake.

[Materials and Methods]

Firstly silicate solubilizing bacteria was isolated and identified as *Pseudomonas psychrotolerans* CS51 and was inoculated on the soybean seedlings grown in paddy soil. We divided the experiment treatment as Control, Insoluble silicate (Magnesium Trisilicate), Bacteria, and Insoluble silicate + Bacteria.

[Results and Discussion]

Interestingly after 15 days, the bacterial treatment significantly enhanced plant height and plant weight by 10% and 45% respectively. The silicon content in shoot was increased by 10% and the chlorophyll content was increased by 20% in CS51 treated plants. The Ca and P content on soybean plant was significantly increased on bacterial treated plant. However, in soil, the bacteria treatment significantly reduced the Ca content whereas, increased the effective silicon by 30%. Moreover, the CS51 inoculation significantly reduced the stress responsive hormones such as ABA (Abscisic acid) and SA (salicylic acid). These results indicate that CS51 is a potential silicon bio-fertilizer.

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