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Soil Microbial Exploration for the Efficient Exploitation of Unknown Culturable PGPR for Geographically Similar Crop Lands

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Soil Health is the central point, where the whole scientific world is concentrating after a legendary research done in development of hybrids, super hybrids and transgenic plants. Microbial interventions in the plant development have gained importance in the recent times. An attempt to conserve the existing beneficial microbes with the same genetic lineage is being done in the name of organic cultivation.

But, there is a scientific necessity to explore the beneficial microorganisms for the possible exploitation in the agriculture sector. Undisturbed forest soils hosts an uncountable microbes which may be supportive to the plant growth. Metagenomics has laid a new path for the identification of huge number of microorganisms in a particular soil sample; nevertheless the cultivability has been the major constraint. Not all the microbes identified potential for plant growth are culturable, and all the culturable PGPR many not support the plant growth. A recent study by Pindi et al., reported a novel bacterial species *Bacillus* PU6 which has the capacity to improve the plant growth when applied in various lands of same agro-climatic zone.

Liquid microbial consortium, the current day technology of biofertilizers is working efficiently at various field level experiments. However, the degree of adoptability impacts greatly on the viability of the organism. It is not certain that all the microorganisms in the consortium will be acclimatized to the local agro climatic conditions. Moreover the temperature is the major constrain. A regular practice of isolation and cultivation of potential microorganisms from various sources irrespective of agro-climatic importance, and large scale production of species which show a better growth with different plant specification may be the root cause for the low viability and adaptation constrain of the liquid biofertilizers.

Contrastingly identification of potential PGPR by a simple innovative method may be the solution for the acclimatization constraint of the inoculums. Collection of soil samples randomly from the nearby forest devoid of human interventions of an agro climatic zone and planting the seeds of desired crop plants may be a simple experiment. The N, P, K levels of all the soils samples would be more or less same as the soils are taken from the same geographical range. The soil which supports the best growth could be screened for the possible exploration of organisms. All the culturable organisms at species level could be identified and grown in separate media. Observation of the effect of each organism on the plant growth in the sterile soil could definitely yield the potential microbes that are supporting the plant growth.

This innovative method of identification could greatly reduce the time and economics involved in exploration of potential organisms in specific with the crop variety. Employing this simple and efficient method of identification in various agro-climatic zones could tremendously improve the crop yield. As the organisms belong to the same climatic region, there would be a very less constraint of adaptability.

Possible exploration of the potential organism may yield the novel species. This method may stand as new and unique strategy in the identification of potential microbes for the Agriculture industry.

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