Zahra Salman, Metabolomics (Los Angels) 2021, Volume 11

Studies on Sustainable Plant Production System Using Plant Growth Promoting Bacteria (PGPB), Biochar and Co-compost from Palm Plantation

Zahra Salman
Zayed University, Dubai, UAE

In contribution to accomplish a zero-emission palm oil industry; biochar was produced with shredded empty fruit bunch (EFB), and co-compost with a mixture of EFB and anaerobic sludge from palm oil mill effluent (POME), independently. In this study, three isolated PGPB strains from co-compost Citrobacter sedlakii CESi7, Citrobacter sedlakii CE9 and Enterobacter cloacae subsp. dissolvens B3 were investigated for their efficiency as PGPB inoculants in screening and cultivation tests with a type culture strain, Enterobacter cloacae subsp. dissolvens LMG 2683(T). The selected strains were screened for their abilities in nitrogen(N) fixation, solubilization of phosphate(P), potassium(K) and silicate(Si) and the production of indole-3-acetic acid (IAA). The plant growth promotion of the strains as inoculants was evaluated with Brassica rapa in a cultivation test with (positive) or without N, P, and K (negative). As a result, CESi7 and CE9 had remarkably high K solubilizing ability. CESi7 had the highest IAA production among the other strains also, it had noticeably high PGP abilities especially towards the negative control, in comparison with other treatments. In addition, the roots had distinct bacterial communities to the rhizospheric soil with exemption of B3 inoculated plants.

The inoculants of PGPB with positive results led to a shift in the rhizospheric native microbial communities that were distinct in each inoculant. CESi7 and B3 inoculated soil treatments are now tested with the addition of co-compost and biochar as an alternative of chemical fertilizers and soil amendment respectively.

Biography

Zahra Salman has completed her bachelor degree in environmental science and sustainability from Zayed University, Dubai, UAE. She is currently a master student in the laboratory of soil and environmental microbiology in Kyushu University, Fukuoka, Japan.