

Abstract

The objective of this research was to isolate arsenic resistant bacteria from the rhizosphere of which several plant species are grown on, located in different areas of the old mine areas in Ratchaburi, Kanchanaburi and Chonburi provinces, Thailand. All bacterial isolates were then tested on their activities in plant-growth promotion in order to support growth of the plants cultivated on agricultural-problematic soils as well as the plants used for phytoremediation. The results show 76 bacterial strains resistant to arsenite. All strains were evaluated for resistance to both arsenate and arsenite at 2-20 mM. The arsenic resistance patterns divided the strains into 38 bacterial isolates which resist to a high arsenic level. Plant growth activities had been tested under various activity conditions and theirs showed N-fixation, plant hormones production, siderophore and ACC deaminase activity except P-solubilization. The results revealed that 23 isolates could be nitrogen fixation activity, 13 isolates could produce Indole Acetic Acid (IAA) and 2 isolates could able to produce ACC Deaminase activity. Additional, only one isolates (CB1-007), which had ability to produce siderophore. In this case, five bacterial isolates were representing as potential to plant growth promoting bacteria in arsenic contaminated soil include isolates KB3-006 KB1-010 KB3-010 RB1-005 and CB1-007.

Keywords: Arsenic, Arsenic-resistant bacteria, Rhizosphere, Plant growth promoting bacteria