

Abstract

Phosphorus solubilizing microorganisms (PSMs) are useful microbes that can hydrolyze the inorganic and organic form of phosphorus to the soluble form that plants can readily absorb. This study isolated PSMs from the soil and optimized their cultural conditions for biofertilizer production. Seven PSMs were isolated from the soil at different locations of Lahore by pour plate technique using Pikovskaya Agar media (PVK). The isolate with maximum solubility of phosphorus (5.56 ppm) was selected and identified as *Aspergillus Niger*. Wheat Bran was used as a substrate for biofertilizer production by solid state fermentation (SSF) and cultural conditions were optimized by Response Surface Methodology (RSM). Five different parameters: temperature (X1), pH (X2), incubation period (X3), moisture (X4) and nitrogen source (X5) were taken and central composite design (CCD) was used to optimize these factors. Among different nitrogen sources ammonium sulfate with maximum solubility of phosphorus was selected. The optimum conditions for the phosphorous solubilization are temperature (44.09 °C), pH (8.31), incubation period (8.81 days), moisture (60.90%) and nitrogen source (2.40%). It can be concluded that using PSMs as biofertilizers is a potential way to increase the world wide food supply without harming the environment.