

## Characterization and Optimization of Culture Conditions for Sulphur Oxidizing Bacteria after Isolation from Rhizospheric Mustard Soil, Decomposing Sites and Pit House

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**Abstract :** Sulphur oxidizing bacteria (SOB) have marked their significant role in perspectives of maintaining healthy environment as researchers from all over the world tested and apply these in waste water treatment plants, bioleaching of heavy metals, deterioration of bridge structures, concrete and for bioremediation purposes, etc. Also, these SOB are well adapted in all kinds of environment ranging from normal soil, water habitats to extreme natural sources like geothermal areas, volcanic eruptions, black shale and acid rock drainage (ARD). SOB have been isolated from low pH environment of anthropogenic origin like acid mine drainage (AMD) and bioleaching heaps, hence these can work efficiently in different environmental conditions. Besides having many applications in field of environment science, they may be proven to be very beneficial in area of agriculture as sulphur is the fourth major macronutrients required for the growth of plants. More amount of sulphur is needed by pulses and oilseed crops with respect to the cereal grains. Due to continuous use of land for overproduction of more demanding sulphur utilizing crops and without application of sulphur fertilizers, its concentration is decreasing day by day, and thus, sulphur deficiency is becoming a great problem as it affects the crop productivity and quality. Sulphur is generally found in soils in many forms which are unavailable for plants (cannot be use by plants) like elemental sulphur, thiosulphate which can be taken up by bacteria and converted into simpler forms usable by plants by undergoing a series of transformations. So, keeping the importance of sulphur in view for various soil types, oilseed crops and role of microorganisms in making them available to plants, we made an effort to isolate, optimize, and characterize SOB. Three potential strains of bacteria were isolated, namely SSF7, SSA21, and SSS6, showing sulphate production of concentration, i.e. 2.268, 3.102, and 2.785 mM, respectively. Also, these were optimized for various culture conditions like carbon, nitrogen source, pH, temperature, and incubation time, and characterization was also done.

**Keywords :** sulphur oxidizing bacteria, isolation, optimization, characterization, sulphate production

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