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Ajar Nath Yadav *Editor*

# Soil Microbiomes for Sustainable Agriculture

## Functional Annotation

Springer

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# Table of contents (19 chapters)

# Chapter 5
# Potassium Solubilization: Mechanism and Functional Impact on Plant Growth


**Chanda Vikrant Berde, Sonal Suresh Gawde, and Vikrant Balkrishna Berde**

**Abstract** A major constituent as well as an essential nutrient of all living cells is potassium (K). This form of K in the soil, however, is not available for uptake by plants. Chemical fertilizers are added to agricultural fields to provide the required K but with negative impact on the environment. K-bearing minerals are solubilized by potassium solubilizing bacteria (KSB) and the insoluble K is converted to soluble K that is easily assimilated by plants. They solubilize K from insoluble forms like mica, fledspar, and others by mechanisms that involve formation of organic acids, siderophores, and also capsular polysaccharides. The diversity and abundance of KSB is dependent on numerous factors, including soil type, climatic conditions, etc. KSB are mostly found in the rhizosphere of plants. These PGPR can be utilized as biofertilizers for sustainable agriculture and can be an efficient substitute to chemical fertilizers.

**Keywords** Potassium solubilizing bacteria · Potassium · Plant growth · Bio-fertilizer · PGPR

## 5.1 Introduction

Feeding the increasing population will be the challenge in the future. Hence there is a need to increase the fertility of the soil in order to have higher yields. Plant nutrients that include nitrogen (N), phosphorus (P), and potassium (K) are supplied through chemical fertilizers (Glick 2012). This leads to temporary increase in fertility. Plants

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