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Original article

## Impact of rhizobacterium *Bacillus sonorensis* on propagation of *Abelmoschus esculentus* and its antimicrobial activity



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### ABSTRACT

In order to evaluate the impact of *Bacillus sonorensis* on propagation of *Abelmoschus esculentus* and its antimicrobial activity was investigated. In the present study, *A. esculentus* was cultivated in *B. sonorensis* inoculated soil and also assessed the morphological as well as biochemical parameters of crops. The culture inoculum of *B. sonorensis* influenced growth and yield of treated plant. The root (39.5 cm), shoot length (20 cm), chlorophyll (1.06 mg), carotenoid (0.445 mg), protein and total soluble sugar content, NR & starch activity were higher in bioinoculated treated plant than control. The fresh biomass and dry weight were drastically increased in bioinoculated plants when compared to control. Gradual increase in composition of pivotal nutrients (N, P, K) and minor nutrients were observed in the bioinoculated plants. The culture filtrate possessed phytopathogenic activity against different phytopathogens. Among the three different phytopathogens, the maximum zone of inhibition (21 mm) was noticed in *Aspergillus colletotrichum* infected plants. The fermentation study was carried out in pilot scale fermentor and the synthesis of plant growth promoting substance was found to be 30.00 mg/l IAA.

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### 1. Introduction

Rapidly increasing human population and increasingly prevailing drought periods have led to deforestation and degradation of many ecosystems in the tropics, especially in India. The increasing population reflects on the environment, resulting in the destruction of biological productivity and biodiversity. Generally, the agri-

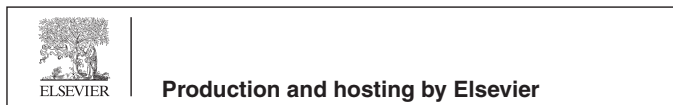
culture serves as a backbone for human population which fulfills the food supply (Pereira et al., 2020). Application of chemical fertilizer leads to soil pollution, contamination of ground water and threats to biodiversity because the gradual establishment of bio-magnifications and eutrophication. The manufacture of quality food is due to maintain the supply of nutrients in sustainable compartment to make sure bio-safety. The innovative view of farm production attracts the growing demand of biological based organic fertilizers exclusive of an alternative to agrochemicals (Bhardwaj et al., 2014). In general, agriculture sector depends upon the fertility of soil, to enrich the supply of nutrients and to restore the nutrients in the field (Araujo et al., 2003).

Organic farming is one of the essential and important strategies to adopt food safety and also to maintain the biodiversity conservation (Megali et al., 2013). Biofertilizers from nature give a better yield, and beneficial to mankind by sustainable economic

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