

Studies on the role of micro-organisms in utilizing phosphate in desert soils

By
Amal El-Sayed Ahmed Abdel-Hamid

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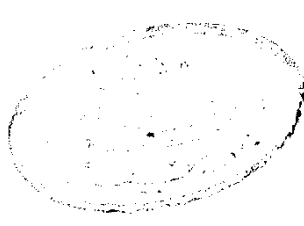
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Faculty of Agriculture
Ain Shams University

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By

Amal El-Sayed Ahmed Abdel-Hamid

B.Sc. (Agric. Microbiology), Fac. Agric.,

Ain Shams University, 1987

This thesis for M.Sc. Degree has been approved by:

Prof. Dr. Abdel-Wahab M. Abdel-Hafez 

President of Ain Shams University and Prof. of Agric. Microbiology

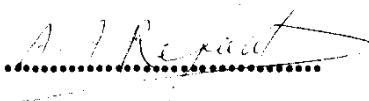
Prof. Dr. N.A. Newegy

..... 

Head of Agric. Botany Dept. and Prof. of Agric. Microbiology,

Fac. of Agric., Moshtohor, Zagazig Univ., Benha Branch

Prof. Dr. A.A.A. Refaat

..... 

Prof. of Agric. Microbiology,

Fac. of Agric., Ain Shams Univ. (Supervisor)

Date of Examination : 22 / 12 / 1994



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By

Amal El-Sayed Ahmed Abdel-Hamid

B.Sc. (Agric. Microbiol.), 1987

Ain Shams University

Under the supervision of:

- **Prof. Dr. A.A.A. Refaat**
Prof. of Agric. Microbiol., Fac. Agric., Ain Shams Univ.
- **Prof. Dr. M.A. El-Borollosy**
Prof. of Agric. Microbiol., Fac. Agric., Ain Shams Univ.
- **Prof. Dr. M.A. El-Sibaie**
Head of Soil Fertility and Microbiology Dept.,
Desert Res. Cen., Min. of Agric.

ABSTRACT

The prevalence of P-dissolvers in Egyptian soils was studied in 36 different localities with different crops. The most active P-dissolving organism was selected and completely identified for using as an inoculant for wheat plants.

Two pot experiments were carried out for cultivating wheat plants in two different desert soils (sandy and calcareous soils). The effect of biofertilization with the locally isolated P-dissolver (which proved to be the most active one in solubilization of phosphate) on the growth and yield of wheat plants, as well as microbial content and activity in their rhizospheres

were also investigated. The effect of application of organic manure (sheep manure, 1%) and supplementation of different forms of P-fertilizers were studied. Densities of total microbes, azotobacters, azospirilla, P-dissolvers and cellulose decomposers were periodically determined in soil and rhizosphere of wheat plants. CO₂ evolution was also estimated as an indication of microbial activity in soil and rhizosphere of the growing plants. At the end of the experiments, straw and grain yields as well as grain content of phosphorus and nitrogen were also evaluated.

The obtained results clearly show that biofertilization using the most active local strain of P-dissolving bacteria, *B. megatherium* IBP-5, in the presence of rock phosphate as a P-fertilizer and garbage compost as an organic manure resulted in improving the growth and increasing yield of wheat plants. In such treatment, microbial growth and activity in the rhizosphere of the growing plants reached their maximal levels.

Key words:

Phosphate dissolvers, *Bacillus megatherium*, Organic manure, Rock phosphate, Calcareous soil, Sandy soil.

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