

This article was downloaded by:

On: 29 January 2011

Access details: Access Details: Free Access

Publisher Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



Phosphorus, Sulfur, and Silicon and the Related Elements

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713618290>

Posters: *Mini Symposium II*—Recent Advances in Microbiological Solubilization of Phosphate Materials

To cite this Article (1993) 'Posters: *Mini Symposium II*—Recent Advances in Microbiological Solubilization of Phosphate Materials', *Phosphorus, Sulfur, and Silicon and the Related Elements*, 77: 1, 329

To link to this Article: DOI: 10.1080/10426509308045641

URL: <http://dx.doi.org/10.1080/10426509308045641>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

Microbiological solubilization of inorganic P-fractions normally encountered in soils

R. Chabot, M.P. Cescas and H. Antoun
Département des Sols, FSAA, Université Laval, Québec
Canada, G1K 7P4

Abstract

Phosphorus solubilizing microorganisms were isolated from four different soils collected from two regions of the province of Quebec. All soils contained P-solubilizing microorganisms, but 10 bacteria and 3 fungi were selected because of their high solubilizing activity. These selected organisms were able to grow on solid culture media containing FePO_4 , AlPO_4 , CaHPO_4 or $\text{Ca}_3(\text{PO}_4)_2$ as sole source of phosphorus. In liquid cultures, fungal isolates were better P-solubilizers than bacterial isolates. In fact, SEM microscopy showed that the hyphae of fungi are attached to the P particles while bacteria are not.

A greenhouse trial was conducted to study the effect of inoculation with P-solubilizing microorganisms on maize (cultivar Funk's 4066) yield and phosphorus uptake. The soil used (one of the four used for the isolation of the microorganisms) was a loam with a pH of 6.22, 4.83% organic matter content, and it contained 175 kg ha⁻¹ P and 730 kg ha⁻¹ K. An equivalent of 180 Kg ha⁻¹ N as ammonium nitrate, and 60 Kg ha⁻¹ K as KCl was applied to all pots. Phosphorus was added at a rate of 70 Kg ha⁻¹ P₂O₅ as superphosphate or rock phosphate. The experimental design was a split plot with 14 treatments (10 bacteria, 3 fungi and a check) and 3 phosphorus treatment (check, rock phosphate and superphosphate) with 5 replications. After 3 weeks of growth, all treatments had no effect on maize dry matter yield. However, the bacterial isolate # 3 did increase the P-uptake of maize plants receiving rock phosphate by 17% as compared to uninoculated control ($P > 0.132$). In general, in the greenhouse trial, the bacterial isolates performed better than the 3 fungi tested. The effects of 3 bacteria and one fungal isolate on maize and lettuce yield and P uptake are under investigation in the field.

Supported in part by William Houde, Ltd.