University of Novi Sad
Faculty of Agriculture

ORGANIC AGRICULTURE FOR AGROBIODIVERSITY PRESERVATION

3rd International Conference Agrobiodiversity

Novi Sad, Serbia, 1st – 3rd June 2017

BOOK OF ABSTRACTS

NITROGEN FIXATION CAPACITY OF INDIGENOUS *AZOTOBACTER CHROOCOCCUM* STRAINS ISOLATED FROM ANATOLIAN SOILS AND THEIR USAGE POTENTIAL IN ORGANIC FARMING

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Azotobacter species are found in agricultural soils playing different beneficial roles: atmospheric nitrogen fixation, production of phytohormones, degradation of toxic compounds and driving the ecological balance in agro-ecosystems. With the purpose of isolating, characterizing and nitrogen fixing capacity of free nitrogen fixing bacteria (FNFB) of the genus A. chroococcum, soil samples were collected randomly from different agricultural fields in different zones of Northern Anatolia. Isolations were done in selective free nitrogen Ashby agar obtaining a recovery of 40%. Fifty soil samples were collected and fifty five isolates were evaluated for colony and cellular morphology, pigment production and metabolic activities. Molecular characterization was carried out using amplified ribosomal DNA restriction analysis. The isolate strains identified based on 16S rRNA gene sequencing. Phylogenetic dendograms of 16S rRNA sequence analysis were made using the least sequares, maximum parsinomy and neighbour-joinning algorithms. Nitrogen fixing capacity determined by indigenous A. chroococcum strains in pure culture and different soils. In this study, comparison of the almost complete 16S rRNA nucleotide gene sequences obtained for strains with corresponding sequences of N fixing bacteria, Azotobacter and Pseudomonas species showed that 8 isolates assigned for morphological properties of the A. chroococcum, formed a closely related, but also distinct group with the species A. chrococcum DSM 2286T. The N fixation capacities of native 3 day old A. chroococcum strains added to Ashby Media varied from 3.50 to 29.35 μg N ml^{-1} on average 10.24. In addition, N fixation capacities of indigenous A. chroococcum strains inoculated with clayey soil, loam soil, and sandy clay loam soil during eight week incubation period were 4.78-15.91 μg N g^{-1}, 9.03- 13.47 μg N g^{-1} and 6.51-16.60 μg N g^{-1}, respectively. It was concluded that the most N fixation by indigenous A. chroococcum strains was in sandy clay loam soils. Based on the results of this study, indigenous A. chroococcum strains may well be suited to achieve sustainable and ecologic agricultural production as indigenous strains, which are adapted in the ecological conditions. However, further research should be conducted for determination of their effect on plant growing by implementation of these strains to soils in arable field and greenhouse conditions, and study of their potential ecology-friendly implementation are necessary.

Key words: *Organic farming, Azotobacter chroococcum, Nitrogen fixation capacity*

Acknowledgment: We would like to express our warm gratitude to TUBITAK for their supporting (KARIYER: 104O556).

CIP - Каталогизација у публикацији
Библиотека Матице српске, Нови Сад

631.147:574(048.3)

INTERNATIONAL Conference Agrobiodiversity "Organic Agriculture for Agrobiodiversity Preservation" (3 ; 2017 ; Novi Sad)
Book of abstracts / 3rd International Conference Agrobiodiversity "Organic Agriculture for Agrobiodiversity Preservation", 1st-3rd June 2017 Novi Sad, Serbia. - Novi Sad : Faculty of Agriculture, 2017 (Novi Sad : Alfagraf). - 140 str. ; 30 cm

Tiraž 100. - Registar.

ISBN 978-86-7520-398-8

a) Пољопривреда - Органска производња - Биодиверзитет - Апстракти

COBISS.SR-ID 314689799

Organic Agriculture for Agrobiodiversity Preservation. 3rd International Conference Agrobiodiversity (2017; Novi Sad)

BOOK OF ABSTRACTS

Editor: Maja Manojlović

Publisher

Web: http://polj.uns.ac.rs/
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