



## Potentialities of bacterial consortium of efficient Plant Growth Promoting Rhizobacteria in enhancing yield and grain quality of durum wheat in arid and semi arid regions with reducing 50% of nitrogen fertilization

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### Abstract:

The excessive use of chemical fertilizers, principally N-fertilizers, causes unanticipated environmental impacts, adversely affecting the environment and the human health. Finding environmentally sustainable methods of improving productivity of plants with reducing the use of chemical fertilizers is a current challenge in the field of agricultural research globally. Against this background, this work aimed at studying the effects of a mixture of three PGPR- bacteria namely *Agrobacterium* sp. previously selected for their multi-PGPR-traits, on yield components and nutrient content in grains of durum wheat under natural conditions. The inoculation with bacterial mixture increased the yield components as well as the nutrient contents in wheat grains compared to uninoculated plants. However, the efficiency of this mixture depends strongly on the applied dose of N-fertilization. At 50%N, the application of the mixture resulted in significant increases in number of spike (26-75%), grain yield (34- 70%), biomass yield (22-71%), nitrogen content (10-16%) and phosphorous content (29-47%) in grains. Interestingly, these increases resulted in attaining values statistically higher than those observed in control plants receiving 100%N in all the environments.

### Biography:

Soumaya Tounsi-Hammami is currently a PhD student at National Agronomic Institute of Tunisia (INAT). She obtained her Master degrees in plant biotechnology from INAT (2014). Her research interests are focused on the interactions between plants and associated benefic microorganisms: Rhizobia and PGPR strains. Particularly, she is interested in isolation of endophytic bacteria from nodules of different legumes, screening plant growth-promoting rhizobacteria for improving growth and yield of legumes as well as cereals, formulation of bacterial



biofertilizers, and molecular characterization of rhizobial and PGPR bacteria.

### Recent Publications:

1. Soumaya Tounsi-Hammami, et al; The ACC-Deaminase Producing Bacterium *Variovorax* sp. CT7.15 as a Tool for Improving *Calicotome villosa* Nodulation and Growth in Arid Regions of Tunisia; 2020
2. Soumaya Tounsi-Hammami, et al; Maize growth and yield promoting endophytes isolated into a legume root nodule by a cross-over approach; 2020
3. Soumaya Tounsi-Hammami, et al; *Sinorhizobium meliloti*: chromosomal types and genomic islands; 2019
4. Soumaya Tounsi-Hammami, et al; High-efficiency transformation of the diploid strawberry (*Fragaria vesca*) for functional genomics; 2006
5. Soumaya Tounsi-Hammami, et al; Transformation of *Ipecac* (*Cephaelis ipecacuanha*) with *Agrobacterium* rhizogenes; 2003

World Microbiology Summit; April 24, 2020; London, UK

**Citation:** Soumaya Tounsi-Hammami; Potentialities of bacterial consortium of efficient Plant Growth Promoting Rhizobacteria in enhancing yield and grain quality of durum wheat in arid and semi arid regions with reducing 50% of nitrogen fertilization; Microbiology 2020; April 24, 2020; London, UK