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Review article

Effect of salty stress on some physiological and symbiotic activities of green bean (*Phaseolus vulgaris L*), variety, Coco Rose

Mourad Bourouhou [a], Boha Eddine Badouna [b]

[a] Laboratory of Plant Biology and Environment, Badji Mokhtar University, P.O. Box 12, Faculty of Sciences Biology Department, Annaba, Algeria
[b] Laboratory of Life Sciences and Techniques, Med Cherif Messaadia University, Institute of Agronomic and Veterinary Sciences, 41000 Souk Ahras, Algeria

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Abstract

In Algeria, the factors which contribute to the extension of the phenomenon of land salinization are linked to aridity and the climate which affects >95% of the territory, and the poor quality of irrigation water, to the system of drainage often non-existent. or non-functional, our work in this context and shed light on the effects of salt stress on a sensitive legume.

Our study aims to evaluate the effect of salt stress on physiological parameters, and the mycorrhizal activity of *Phaseolus vulgaris* L, Coco Rose variety and soil analyzes were also carried out. The latter are grown in pots subjected to salt stress with increasing concentrations of Nacl solution of 6%, 9% and 12%.

Our results confirm that saline stress induces an effect on the parameters studied to varying degrees compared to the control. However, a low content of Chlorophyll A, protein and sugars was recorded and an increase in the proline content as well as a negative influence on the physicochemical parameters of the soil each time the concentration increased. However, on mycorrhizal activity, the results showed a decrease in the colonization rate each time the "Nacl" concentration increased between 80, 60 and 30% respectively for decreasing Nacl concentrations.

Introduction

Nacl causes multiple disturbances on plant metabolism at the molecular, biochemical and physiological level, and negatively affects germination, it is the most sensitive stage by osmotic effect and/or ionic toxicity [1].

However, this natural process is affected by several abiotic constraints which reduce its effectiveness such as temperature variations, soil deficiency in mineral elements, soil acidity, water stress and salinity [2].

Plant salt tolerance is a complex phenomenon that involves morphological and developmental particularities with varied physiological and biochemical mechanisms. These characteristics of adaptation to environmental constraints have attracted the attention of numerous researchers [3].

Much recent research has shown that the development and productivity as well as the quality of bean pods are strongly linked to the symbiosis that the plant establishes with beneficial soil microorganisms, including nitrogen-fixing bacteria and endomycorrhizal fungi. Vesicles and arbuscules [4], In this perspective, the action of introducing legumes into agricultural rotation systems for the development of soils and the minimization of the use of chemical fertilizers and abundant irrigation to relieve the environment of their pollution [5]. The precipitation in our region of El Tarf, in the northeast of Algeria about 80km from the Algerian-Tunisian borders, for the 3 three months of May, June and July does not exceed 31.1mm and an average annual precipitation 450mm for the year 2022, humidity is 78% for an average of the 3months of the trial period April May June.

This research contribution aims to clarify certain notions about salt stress in a legume and to evaluate the effect of salt stress induced by sodium chloride "Nacl" at different doses on green beans (*Phaseolus vulgaris L*). Grown from seed in pots under semi-controlled conditions. The plants are subjected to the study of certain physiological parameters (content of chlorophyll pigments, soluble sugars, total proteins and proline) and physicochemical parameters of the soil, as well as to see the mycorrhizal symbiotic activity in comparison with control plants.

Conclusion

(Phaseolus vulgaris L) is a profitable legume due to its remarkable atmospheric nitrogen fixation property. This is due to their symbiotic relationship with the mycorrhizae. and given the sensitivity of this variety to abiotic stress, our work is carried out in this sense, in this context.

We can affirm that the action of salt stress is all the more marked as the salt concentration is high and that the recorded values of all the parameters studied present significant regressions each time the …

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