

RESEARCH REGARDING THE INFLUENCE OF SALINITY ON GROWTH AND DEVELOPMENT OF POTATO PLANTLETS

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Introduction

Accumulation of salts, in particular those of sodium, is one of the main physiological threats for ecosystems. Salt disturbs plant growth by limiting nutrient assimilation and diminishing quality of water available for plants. The excess of sodium causes destruction of soil structure, that lack of oxygen, cannot support plant growth. For selecting plants with resistance to salinity, can be used *in vitro* culture techniques (thereby, the genotypes can be evaluated in a limited space).

Khenifi and colab. (2011) [2] emitted the idea that the length and weight of microplants root have been influenced by different NaCl (0-120 mM) concentrations used for certain varieties of potato. Farhatullah and colab. (2002) [1] studying the cultivar Cardinal showed that different concentrations of NaCl influenced microplants root length growth *in vitro* and did not respond significantly to the number of roots.

Material and methods

The research refers to the salinity influence of different NaCl concentrations (0, 25, 50, 75 and 100 mM) over plantlets height, number and length of internodes and number of leaves. The studied genotypes were: Christian, Roclas, Marfona, Riviera, Tresor.

Results

Concentrations of 100 and 75 mM NaCl had a negative effect less stressed for Riviera and Roclas varieties regarding the average length of internodes. Concentrations experimented did not influence the formation number of leaf for Riviera variety. The lower influence of salinity over plantlets height was observed for varieties Riviera and Roclas that at concentration of 100 mM, reach 7.80 cm and 6.15 cm.

Internodes number decrease with increasing NaCl concentration in the culture medium. Riviera variety presented the best resistance to concentrations of 25 and 100 mM (forming between 10.44 and 7.33 internodes / plantlets), was exceeded by the Christian variety at concentrations of 50 and 75 mM NaCl.

The average length of internodes was less influenced by NaCl for Riviera and Roclas varieties showing even at concentrations of 100 and 75 mM NaCl quite close values (0.80, 0.82 - 0.65, respectively Roclas variety; 0.82 cm Riviera).

The leaves formation highlights Riviera variety, showing at all four concentrations of NaCl highest number of leaves (even at the maximum concentration of 100 mM presents 10.67 leaves).

Varieties tested behaved like this: Roclas, Riviera and Tresor not differ significantly in the length of plantlets; Riviera and Christian differ significantly in internodes formation from the other varieties; Roclas is distinguished by the higher internodes length (not significantly different from the variety Riviera); Riviera differ significantly from the other varieties by the number of leaves formed.

Conclusions

Graduation of NaCl concentration affects differently the growth and development of plantlets. Concentration of 100 mM NaCl did not affects microplant height for Riviera and Roclas varieties, these recorded the highest values of microplants height. All these considerations lead to the identification of new genotypes with resistance to environmental stress conditions (thermal, hydric and salt conditions).

References

- [1] Farhatullah , Rashid Mahmood and Raziuddin , 2002. *In vitro* Effect of Salt on the Vigour of Potato (*Solanum tuberosum* L.) Plantlets. Biotechnology: 73-77
- [2] Khenifi, M. L., Boudjeniba, M. and Kameli, A., 2011: Effects of salt stress on micropropagation of potato (*Solanum tuberosum* L.), African Journal of Biotechnology Vol. 10(40), 7840-7845.