

Intoxication of wheat seedlings with 50 mM NaCl and follow-up attempt to “cure” by extremely diluted NaCl (30c)

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Background

“High level of salinity deteriorates seed germination, growth and yield of crops in cultivated lands all over the world. There is no effective remedy to mitigate this global problem”, Mondal, Sukul et al.¹ summed up the background of their study that led to the conclusion that homeopathically prepared, extremely diluted NaCl 200c promotes seed germination in seedlings of cowpea under salt stress.¹

Aim

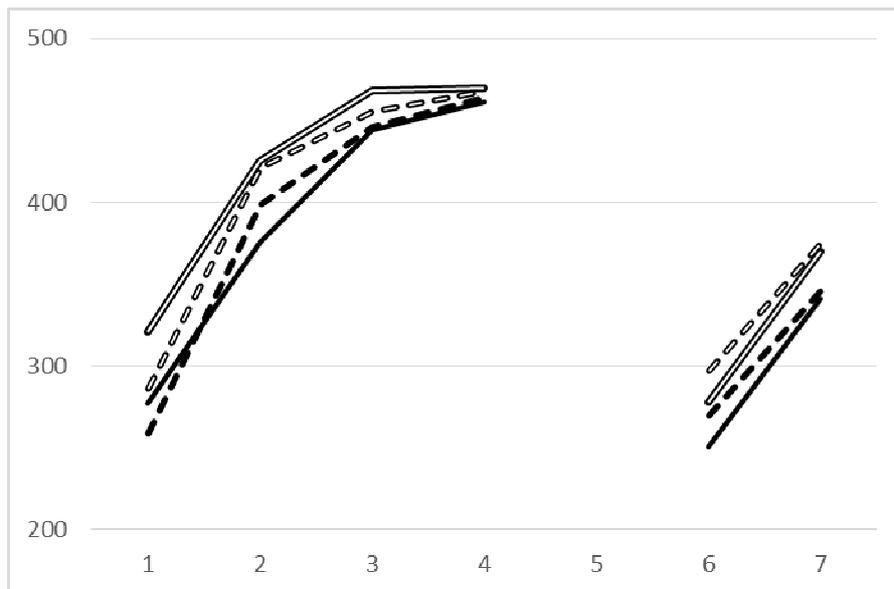
To investigate if the wheat germination model standardized at the Interuniversity College^{2,3} can be useful in investigating the NaCl issue; i.e. the study was not designed as a replication of the study by Mondal, Sukul et al.¹

Methods

Grains of winter wheat (*Triticum aestivum*) were observed under the influence of extremely diluted NaCl (10^{-60}) prepared by stepwise dilution and agitation according to a protocol derived from homeopathy (“N30c”). Analogously prepared water was used for control (“W30c”). Grains (500 per group) were pretreated (intoxicated) with (non-agitated) NaCl 50mM (“N”) or with water (“W”) prior to treatment with N30c or W30c. Seedlings were allowed to develop under standardized conditions for 32 h; germination of stalks and of roots were monitored at intervals of 4 h.

Results

With regard to intoxication, the figure below shows that the groups treated with N (black lines) exhibited less growth than the W control groups (white lines). With regard to the attempt to “cure”, the N+N30c group (black dashed line) was not statistically different from the N+W30c group (black solid line), and the W+N30c group (white dashed line) was not statistically different from the W+W30c group (white solid line).



Germination. Ordinate: number of germinated stalks (left) and of roots (right). Abscissa: time at intervals of 4h, 1 = 20h after start of the experiment. For explanation see text.

Conclusion

The hypothesis that treatment of wheat seedlings with the extreme dilution NaCl 30c will “cure” the effect of previous intoxication with NaCl 50 mM on seed germination could not be accepted. If further experiments are to be performed on the wheat model, these should include different intoxication solutions (e.g. 100mM¹), different treatment dilutions (e.g. 200c¹) or different durations of the experiment³. The use of cowpea¹ instead of wheat should also be considered.

Keywords

homeopathy, wheat stalk growth, NaCl, salt, high dilution

Statement of conflict of interest

There is no conflict of interest.

Statement of financial support

There was no financial support.

References

- 1 Mondal S, Sukul NC, Sukul C, Natrum mur 200c promotes seed germination and increases total protein, chlorophyll, rubisco and sugar in early seedlings of cowpea under salt stress. *Int J High Dilution Res* 2012, 11(40): 128.
- 2 Kiefer P., Matzer W., Schiestl S., Hartung H., Schwärzler I., Seunig R., Hofäcker J., Endler P.C. Wheat germination and extremely diluted agitated gibberellic acid (10e-30) – a multi researcher study. *Int J High Dilution Research* 2012; 11(39): 45-59
- 3 Endler P.C., Matzer W., Reich C., Reischl T., Hartmann A.M., Thieves K., Pflieger A., Hofäcker J., Lothaller H., Scherer-Pongratz W.: Seasonal variation of the effect of extremely diluted agitated gibberellic acid (10e-30) on wheat stalk growth – a multi researcher study. *The Scientific World Journal* 2011; 11: 1667-1678.