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BRIEF COMMUNICATION

Salinity Tolerance through Seed Treatment with Proline

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Abstract. The treatment of rice seeds with 0.02% proline increased the germination under saline conditions.

From a comparative study of free amino acids of wild and cultivated rice cultivars BAL (1975) reported very high proline and alanine content of wild rice — *Oryza coarcata*, which grows profusely in saline marshy areas (electrical conductivity above $25.10^{-3}\Omega^{-1}cm^{-1}$). An investigation was therefore undertaken to study the effect of proline and alanine on germination of paddy seeds.

Paddy seeds (*Oryza sativa* L. cv. 'I.R.8') were treated with proline and alanine each at 0.01, 0.02, 0.05 percentage concentration. Untreated seeds were taken as control. Paddy seeds were kept in the respective solutions for 24 h and then they were dried with the help of filter paper and then air dried. Next day the seeds were kept in Petri dishes with 0, 10, 20, 30 and 40 . $10^{-3}\Omega^{-1}cm^{-1}$ salt (sodium chloride) solution for germination. Each set was repeated three times. Germination percentages were noted for six days.

Germination percentage of both treated an untreated seeds (Table 1) decreased with an increase in electrical conductivity of the salt solution, but the rate of decrease in germination is much less in the case of proline at 0.02% concentration. At $40.10^{-3}\Omega^{-1}cm^{-1}$ salt solution where no seeds germinated in the case of untreated and alanine treated seeds, the seeds treated with proline at 0.02% germinated, although the germination percentage is less. Increased concentration of proline could not increase the germination percentage above 0.02% concentration.

The result of the experiment showed that treatment of seeds with proline at 0.02% can increase the germination percentage under saline condition possibly by supply energy for growth and survival as suggested by STEWART *et al.* (1966) under stress conditions.

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TABLE 1
Effect of proline and alanine on germination percentage of paddy seeds

Electrical conductivity the medium of germination	Untreated seeds	Proline Treated 0.01%	0.02%	0.05%	Mean	Alanine Treated 0.01%	0.02%	0.05%	Mean
0 . 10^{-3} Ω^{-1} cm^{-1} (Distilled water)	93.3	93.6	96.0	96.0	95.2	86.3	96.0	90.0	90.7
10 . 10^{-3} Ω^{-1} cm^{-1}	83.3	93.6	96.0	99.0	96.2	86.3	93.6	90.0	89.9
20 . 10^{-3} Ω^{-1} cm^{-1}	69.0	73.0	96.0	66.0	78.3	53.6	63.0	83.3	66.6
30 . 10^{-3} Ω^{-1} cm^{-1}	53.6	36.3	66.6	40.0	47.6	36.0	16.0	33.0	28.3
40 . 10^{-3} Ω^{-1} cm^{-1}	0.0	0.0	36.0	0.0	12.0	0.0	0.0	0.0	0.0
Mean	59.8	59.3	78.1	60.2	—	52.4	53.7	59.2	—

References

BAL, A. R.: A note on the comparative study of free amino-acids content between wild salt tolerant rice and cultivated rice varieties. — Curr. Sci. **44** : 194—195, 1975.

STEWART, C. R., MORRIS, C. J., THOMPSON, J. F.: Changes in amino acid content of excised leaves during incubation. II. Role of sugar in the accumulation of proline in wilted leaves. — Plant Physiol. **41** : 1585—1590, 1966.

BOOK REVIEWS

BOWLER, K., HEATH, J. E. (ed.): **Journal of Thermal Biology.** — Vol. 1, No. 1. Pergamon Press Oxford, New York, Braunschweig 1975. 60 S.

Im Oktober 1975 ist das erste Heft einer neuen Zeitschrift, des Journal of Thermal Biology, erschienen. Diese Zeitschrift wird Arbeiten über den Mechanismus der Temperatureinwirkung auf lebende Organismen veröffentlichen, und zwar auf biochemischer und physiologischer Ebene sowie auf der Ebene des ganzen Organismus. Sie soll zur Konzentration der Literatur auf dem Gebiet der Thermalbiologie dienen. Jeder Band wird in 4 Hefte gegliedert, mit Artikeln in englischer, event. französischer und deutscher Sprache erscheinen. Die Zeitschrift wird von Dr. K. BOWLER, University of Durham, Durham, England und Prof. J. E. HEATH, University of Illinois, Urbana, Illinois, USA herausgegeben. Mitglieder des Redaktionsrates sind J. BLIGH, Babraham, C. GALE, Washington, J. N. R. GRAINGER, Dublin, D. JANKOWSKY, Kiel, K. Y. H. LAGERSPETZ, Turku, A. MALAN, Strasbourg, C. L. PROSSER, Urbana, J. K. RAISON, Macquarie, A. H. ROSE, Bath, J. STOLWIJK, Yale, B. P. USHAKOV, Leningrad. Das Jahresabonnement beträgt 35.00 US $, für Privatpersonen 25.00 US $. Pergamon Press stellt auf Anfrage kostenlos Rezensionsexemplare zur Verfügung.

INGRID TICHÁ (*Praha*)

THOMAS, E., DAVEY, M. R.: **From Single Cells to Plants.** — Wykeham Publications (London) Ltd., London—Winchester 1975. 171 pp., 2.50 Lstg paper, 3.25 Lstg cloth.

The ambition of the Wykeham Science Series is to acquaint students and young research workers with results in various fields of science. With respect to this purpose the manual about tissue cultures is more or less a textbook which is not an exhausting review of results achieved in this field. Regardless of a limited space the authors succeeded in giving anearly complete and up-to-date picture of "classic" (basic materials and methods, the culture of plant organs, tissues and cells, morphogenesis in cell cultures) and especially of "modern" (the culture of haploid reproductive cells, isolation and behaviour of higher plant protoplasts) aspects of this so rapidly progressing problematics. Intelligible interpretation reflects authors' deep experimental experience and their consultation with well-known scientists (Prof. Cocking, Melchers, Street). The final critical chapter "Present and future" emphasizes without exorbitant optimism the exciting chances of plant tissue cultures not only in fundamental research but also in plant breeding.

The text is supplemented with nearly one hundred objective high-quality photographs and drawings. The appendix contains recipees of basic cultivation media and description of fundamental methods. This publication is not only a good textbook but it may be recommended to all scientists interested in modern methods of experimental botany.

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