White clover cell culture tolerance to copper ions

Article *in* Journal of Biotechnology · August 2015

DOI: 10.1016/j.jbiotec.2015.06.362

3 authors, including:

Irina Kiseleva
Ural Federal University
12 PUBLICATIONS **24** CITATIONS

SEE PROFILE

Distribution of *Alternaria* sp. on *Brassica napus* seeds from growing fields affected by alternaria black spot in Calarasi County

Lavinia Mariana Berca [1,*], Gheorghe Danut Cimponeriu [2], Stelica Cristea [1]

[1] *University of Agronomic Sciences and Veterinary Medicine of Bucharest, Bucharest, Romania*
[2] *Department of Genetics, University of Bucharest, Bucharest, Romania*

E-mail address: laviniamariana.berca@gmail.com (L.M. Berca).

Alternaria sp. are found often in conjunction in soil and different parts of the plants. These fungus determines complex and confusing phenotypes on foliar parts of the plant, including reduction of quantity and quality of plants and seeds production. The aim of this study was to estimate the distribution of *Alternaria* fungus on seeds taken directly from growing fields from Calarasi County. The samples of seeds were taken directly from 12 growing fields affected by alternaria black spot, just prior to harvest. Five seeds from the same cultivars were incubated for 10 days on sterilized potato-dextrose-agar culture environment, at 22 °C. The colonies were examined under a microscope (40×), until 50 *Alternaria* species have been identified. The remaining colonies were used to extract DNA. The samples of genomic DNA were used for RAPD or HRM and melting analysis, in the presence of fluorescent dyes. The most common fungus identified per plates were *A. brassicicola* (24–82%), *A. brassicae* (2–22%) and *A. radicinum* (0–34%). The RAPD, HRM and melting analysis support the variable rapport between the fungus from these samples. *A. brassicicola*, *A. brassicae* and *A. radicinum* are the most common fungus identified on seeds taken from growing fields affected by alternaria black spot from Calarasi.

Acknowledgements: This paper was published under the frame of European Social Fund, Human Resources Development Operational Programme 2007–2013, project no. POSDRU/159/1.5/S/132765.

http://dx.doi.org/10.1016/j.jbiotec.2015.06.361

White clover cell culture tolerance to copper ions

Alexander Ermoshin, Svetlana Shatunova, Irina Kiseleva*

Ural Federal University, Ekaterinburg, Russia

E-mail address: irina.kiselyova@usu.ru (I. Kiseleva).

Human activities lead to environmental pollution by heavy metals. The Urals is the region characterized by soil contamination by heavy metals, mainly, copper. Green biotechnologies are the best way to return contaminated lands to economic use. In that case, the study of hyperaccumulators and excluders among plants could be of great interest. White clover (*Trifolium repens* L.) is a valuable fodder, melliferous and ornamental plant and is widely spread in polluted sites. The question is – could this species be improved by cell selection for remediation or agricultural use on territories with high level of copper? Several passages of clover callus on the medium with (75 μmol and 125 μmol) or without copper ions, were made. It was found, that these concentrations were not lethal to plants, but showed toxic effect. Callus cultures quickly lost vitality: in a month, 69% or 31% of explants were survived in the cases of 75 μmol or 125 μmol, respectively. These calli were transfered on a medium containing 200 μmol and 300 μmol copper ions. Growing calli on these media has been obtained. Plant regeneration was shown in 3% of calli. Therefore, white clover (*Trifolium repens* L.) could be interesting for agricultural and environmental biotechnologies.

http://dx.doi.org/10.1016/j.jbiotec.2015.06.362

The effects of salicylic acid pretreatment on the antioxidant enzymatic system of chickpea seedlings under salt stress

Marin Soare [1,*], Rodica Soare [1], Cristina Babeanu [2], Dorina Bonea [1]

[1] *Faculty of Agriculture and Horticulture, University of Craiova, Romania*
[2] *Department of Chemistry, University of Craiova, Romania*

E-mail address: soare_marin@yahoo.com (M. Soare).

High salinity in soils affects plant metabolism in many ways: ion toxicity, osmotic stress, and nutritional imbalance, production of reactive oxygen species which are responsible for the damage to membranes, proteins, DNA, and lipids. The generation of reactive oxygen species is scavenged by an antioxidant system including antioxidant compounds and antioxidant enzymes. Salicylic acid has been used to counteract the adverse effects of salt stress in many crop plants. The objective of this study is to investigate the effects of salicylic acid pretreatment on the antioxidant enzymatic system (catalase, peroxidase and superoxide dismutase) of chickpea seedlings under salt stress. A two-factor experiment was conducted in a completely randomized design. The first factor included four levels of salicylic acid and the second factor included three levels of NaCl. The increase in NaCl concentration leads to an increase in the activity of the investigated antioxidant enzymes indicating oxydative stress conditions in plants. Antioxidant enzyme activity varies with the concentration of salicylic acid applied to chickpea seedlings subjected to salt stress. The obtained results led to the conclusion that chickpea seedlings can tolerate salt stress in the tested doses, through the metabolic changes that were depicted by the investigated biochemical indices, and recommended the application of salicylic acid concentrations of 0.75 mM alleviating the impact of the stressor.

http://dx.doi.org/10.1016/j.jbiotec.2015.06.363

Renewable energy – As future alternative for the Romanian rural communities

Ada Flavia Cristina*, Camelia Manescu, Carmen Dumitrescu, Nicoleta Mateoc Sirb

Department of Management and Rural Development, Faculty of Agricultural Management, University of Agriculture and Veterinary Medicine 'King Michael I of Romania from 'Timisoara, Romania

E-mail address: adaflaviacristina@gmail.com (A.F. Cristina).

Sun, water, wind, biomass are inexhaustible energy resources that can fulfill the current needs for electricity and heating in a friendly environmental way. One of the main priorities of the European Commission is to promote the renewable energy and contribute to their exploitation, in the aim to ensure a better environmental protection and a sustainable development. Currently, in Romania these desiderata are far from the country's potential, major measures being required. For example, the last statistics are showing that, 3% of the villages are still without electricity. Furthermore, about 98,871 households, placed in 2237 localities are yet without electricity. Among these, 61,187 households are located in