Gliding arc plasma modified number of capsules in poppy seed

Perla Kuchtová 1, Bozena Šerá 2, Bogdan Gavril 3, Michal Šery 4, Eugen Hnautic 3

1 Department of Crop Production, Faculty of Agrobiology, Food and Natural Resources, Czech University of Life Sciences Prague, Czech Republic
2 Institute of Nanobiology and Structural Biology GCRC AS CR, České Budějovice, Czech Republic
3 Apollonia University of IASI, 11 Pacurari Streer, Iasi, Romania
4 Department of Physics, Pedagogical Faculty, University of South Bohemia, Jeronymova 10, České Budějovice, Czech Republic
E-mail address: kuchtova@af.czu.cz (P. Kuchtova).

Plasma has been studied in chemo-physical technological application on solid materials and non-thermal plasma in application for biomedicine and biology. It is known, that non-thermal plasma effect seed germination and early growth of plants. The gliding arc plasma (non-thermal, high pressure) has been well used for pre-sowing of various agricultural plants, such as wheat, oat, barley, corn, and hemp. Our research was focused on gliding arc plasma pre-treatment of two cultivars of poppy seed (Papaver somniferum L. cv. Major and cv. Orpheus). Parameters of plasma pre-sowing: time exposition 180 s, working gas air, temperature small than 8800 ha. The plasma pre-treatment negatively affected cv. Orpheus compared to control plants. This effect may be used in the cultivation of ornamental poppies in horticulture. This research was supported with the project QH92106 and the Infrastructure for Systems Biology in Europe.

http://dx.doi.org/10.1016/j.copbio.2013.05.425

The analysis of correlation between varieties and hybrids used and financial politics on farm's results

Virgil Marcu, Carmen Dumitrescu, Iasmina Iosim

Faculty of Agricultural Management, Banat's University of Agricultural Science and Veterinary Medicine from Timisoara, Romania
E-mail address: marcu.virgil@gmail.com (V. Marcu).

Many of the farmers that activate in Western part of Romania appeal to loans in introducing the new technologies from cereals and oilseeds plants cultivation field due to the seasonal character of the production. In the present paper we studied the link between the crops, the cultivated surfaces and areas, the average production per hectare and total production and the total income in one of the most representative farm from the agricultural sector. The farm has three large areas for cereals and oilseeds plants cultivation located in two neighboring counties. Overall the farm has more than 8800 ha, that is why we consider it an important player in the agricultural sector and also because it is always oriented to use the latest results of the researches regarding the cultivation technologies, the latest varieties, hybrids and products for plant protection. All these actions correlated with a proper financial politics can lead to special results as underlined in the paper.

http://dx.doi.org/10.1016/j.copbio.2013.05.426

Gliding arc plasma modified number of capsules in poppy seed

Protein maps of buckwheat and amaranth

Andrei Trebichalsky, Zdenka Galova, Eva Palencarova, Milan Chnapek, Zelmira Balazova

Department of Biochemistry and Biotechnology, Slovak University of Agriculture in Nitra, Nitra, Slovak Republic
E-mail address: zelmira.balazova@unig.sk (A. Trebichalsky).

The gluten fraction of cereal proteins causes the most frequent food intolerance named coeliac disease (CD). This disease of the upper small intestine in genetically susceptible individuals triggered by ingestion of wheat, barley, rye, triticale and possibly oats products. At the present time, buckwheat and amaranth, so called pseudo-cereals can be consumed as part of a gluten-free diet for CD. The aim of this study was to analyse genotypes of amaranth (cv. Plaisman) and buckwheat (cv. Pyra). Proteins were extracted from the milled flour and separated by 2D gel electrophoresis. Allergic properties of pseudocereal proteins were investigated by in vitro gastro-duodenal digestion. Upon initial observation, amaranth and buckwheat have many proteins focussed in the acidic region. Fewer proteins were detected in the pH 6–11 gel, especially in the HMW weight region of the gel where storage proteins were observed for the cereals. Image analysis showed a higher number of spots on 2-DE map of buckwheat compared to amaranth. In vitro gastro-duodenal digestion profile from the amaranth extract was different compared to cereals but there were found out some similarities in buckwheat. Lots of resistant proteins were found on the whole sample digestion gel after 2 hours of gastric digestion. In the samples of buckwheat cv. Pyra we found more resistant proteins in comparison with analysed cereals.

http://dx.doi.org/10.1016/j.copbio.2013.05.427

Detection of leptine glycoalkaloids by using FTIR and RAPD markers in Solanum somatic hybrids

Imola Molnár, Abdelmoumen Taoutaou, Elena Rakosy Tican

Plant Genetic Engineering Group, University of Babes-Bolyai, Cluj Napoca, Romania
E-mail address: molnar.imola5@gmail.com (I. Molnár).

Potato (Solanum tuberosum L.), an especially valuable legume is sensitive to many diseases and pests. Colorado potato beetle (CPB) is the most significant pest, which greatly reduces the annual potato production. The only way of combating CPB is the use of resistant potato varieties. One of the most effective sources of host-resistance mechanisms to CPB is the natural resistance of the wild species S. chacoense caused by the expression of rare glycoalkaloids, leptines only in aerial tissues. Somatic hybrid plants were obtained between cultivated potato and S. chacoense. Moreover, transgenic lines of S. chacoense deficient in DNA mismatch repair (MMR) were also used to produce SH clones in order to increase homeologous recombination and hence the introgression of wild species DNA into potato crop. The aim of this study was to assay the ability of somatic hybrid clones to synthesize leptine glycoalkaloids by the application of linked RAPD markers. Using Fourier transform infrared spectroscopy (FTIR) the total chemical composition of SHs was compared with both S. tuberosum and S. chacoense. The SHs with or without MMR deficiency were also compared with each other for the presence of RAPD markers and in the total biochemical composition. The above mentioned techniques could be used complementary for selecting potato genotypes which synthesise similarly high leptine as S. chacoense. Acknowledgements Funding provided by the project CNCS PNII-ID-PCE-2011-3-0586 is