

Responses of rice plants to cadmium stress



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Cadmium contamination of soils is a big problem everywhere due to the widespread use of phosphate fertilizers. Cadmium disturb physiological and biochemical processes, thereby inhibits the growth and development of plants. Cadmium accumulation in plants depends on the content of other minerals. In this regard, the aim of the work was to identify tolerant to Cd rice varieties and study the effect of Cd on the content of mineral elements in rice grain.

Rice varieties were grown 7 days in solutions, containing 0, 50, 100, 200, 400 μM CdSO_4 . For study the mineral composition in rice grain plants were grown to full maturity on soil, containing 2 m Mol/kg of CdSO_4 . Determination of mineral elements performed by ICP-MS – Agilent 7500.

It was identified relatively tolerant and sensitive to Cd rice varieties. On the accumulation of biomass by shoots rice varieties can be positioned in the next row (% of control): – Bakanas (59%) > Madina (57%) > Barakat (15%) > Violetta (13%) > Chapsari (4%) = Fisht (4%) > Anayt (3%) > Marzhan (2%).

Cadmium decreased the content of Mg, Mn, Fe, Zn, Cu in rice grain. It is interesting that in tolerant Madina cv the content of mineral elements reduced in the least degree and in sensitive Barakat and Chapsari cvs – in the greatest degree.

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Differential expression of curcumin synthase at nine agroclimatic zones as influenced by environment and nutritional variation



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Curcuma longa L. a spice and medicinal plant, accumulates substantial amount of bioactive phytochemicals like curcumin, leaf and rhizome essential oil. Environmental factors like temperature, rainfall, humidity and soil nutrients play a crucial role in plant growth. However climatic conditions and soil quality at different growing areas are the most important reason for the variation in plant secondary metabolites production. In the present study, turmeric plant was cultivated at nine agroclimatic regions for three consecutive generations. Soil samples from each zone were analyzed for nutrients like nitrogen (N), phosphorous (P) and potassium (K). Analysis of essential oil and curcumin content showed wide range of variation at different experimental zones. Percentage of curcumin varies from 1.5 to 5% and essential oil from 0.4 to 0.7% across all the zones. Gene expression analysis for curcumin content was analyzed and validated through quantitative polymerase chain reaction (q-PCR) analysis. The result revealed that curcumin

content was highly influenced by environmental factors and nutritional variations. Thus yield of curcumin and essential oil can be improved through proper nutritional management and selection of growing locations.

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Potassium hyaluronate influence on the lipid composition and activity of phospholipase A2 in the injured sciatic nerve



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It is supposed that using hyaluronic acid is perspective factor for enhancement post-traumatic nerve regeneration. This is also evidenced the data of some authors about the role of hyaluronic acid in services of proliferation and self-maintenance of neural stem cells, also in reduction of phospholipid hydrolysis at the expense of phospholipase activity A2 under the inflammation of the lungs and osteoarthritis.

We researched the activity of the phospholipase A2 and the rat's lipid composition of the sciatic nerve after experimental damage after 12 h, 1, 3, 7 and 30 days of posttraumatic period together with applying the potassium hyaluronate on a coup injury in posttraumatic period in doses 2, 17 and 30 mpg.

By the methods of dimensional chromatography and densitometry it has been reached that the nerve injury is accompanying with increasing of lysophospholipids content and free fatty acids in the lipid fraction of the rat sciatic nerve maximally on 7 days after injury. It has been researched that activity of Ca^{2+} -dependent, Ca^{2+} -independent phospholipase A2 increases at the same time.

Administration of hyaluronate acid is resulted to dose-dependent decreasing of the lysophospholipid content and activity decreasing of Ca^{2+} dependent phospholipase A2, in proportion of 30 mpg on all terms of recovery period. Using potassium hyaluronate didn't change the activity of Ca^{2+} -independent phospholipase A2.

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Effect of antioxidant xymedon on the lipid phase of the erythrocytes' membrane under oxidative stress



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Peroxidation of membrane phospholipids is one of the most common mechanisms for degradation of membrane structures and a cell as a whole. Therefore, to correct pathological conditions associated with oxidative stress, the use of exogenous antioxidants, one