

Faculty of Science

Department: Botany

Name: Mohamed El Anwar Hosain Osman

Title: Effect of sewage wastewater treated by nostoc muscorum and anabanena subcylindrica on the growth of zea mays and phaseolus vulgaris

Authors: Mohamed El Anwar Hosain Osman; Wagih Abdel Fattah El-Shouny; Mostafa Mohamed El Sheekh & Eman Wahba El Sayed El Gammal

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Abstract:

Zea mays (Sakha 321) and Phaseolus vulagris (Giza 6) were irrigated with sewage wastewater treated with Nostoc muscorum and anabaena subcylindrica. The results showed that irrigation of plants by untreated or treated wastewater caused stimulation in the measured growth parameters of both plants. In addition pigmentation as well as protein and carbohydrate contents were stimulated. This stimulation was attributed to the presence of high levels of essential nutrients such as nitrogen, phsplhorus, and organic matters in wastewater . On the other side, there was a slight inhibitory effect of wastewater on some measured growth parameters of the plants. This effect may be due to the presence of some heavy metals in wastewater.

Key words:

Carbohydrate, cyanobacteria, irrigation, pigmentation, protein, sewage

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Department: Botany

Name: Mohamed E.H. Osman

Title: Response of catharanthus roseus shoots to salinity and drought in relation to vincristine alkaloid content

Authors: Mohamed E.H. Osman, Soad S. Elfeky, Kamelia Abo El Soud & Amira M. Hasan

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Abstract:

The present study aims at investigation of the response of *Catharanthus roseus* shoots to salinity (control, 100 and 150 mM) and drought (control, two-weeks-regime) for a period of 4 months. Total proteins, amino acids, praline and vincristine alkaloid contents were estimated before and after stress. Both salinity and drought reduced the amount of shoot total proteins while increased the amount of total amino acids which has been attributed to enhanced protein degradation and/or de novo synthesis of amino acids. Accumulation of praline after both stresses supported the previously recorded correlation between cellular praline levels and the capacity to survive environmental stresses. Salinity and drought results in increased amounts of the amino acids serine, methionine and arginine, which are considered precursors for the synthesis of glycinebetaine, nicotinamide and putrescine that are commonly encountered osmolytes that accumulates in plants under salinity and drought stresses. Vincristine alkaloid content increased with two peaks at 150 mM salinity at the 2nd month of treatment and at the 4th month of the highest drought level. The increase in vincristine content was attributed to the raised levels of arginine subsequent to stress that could derive the biosynthesis of putrescine. This polyamine was found to induce nitric oxide biosynthesis which acts as chemical elicitor for indole alkaloid production of *C. roseus* shoots.

Key words:

Catharanthus, salinity, drought, vincristine, amino acids, praline, medicinal plants