Environmental Engineering and Management Journal June 2013, Vol.12, No. 6, 1287-1294
http://omicron.ch.tuiasi.ro/EEMJ/

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ASSESSMENT OF SYNERGIC REGULATORY ACTIONS OF SPRUCE BARK EXTRACT AND DEUTERIUM DEPLETED WATER ON MAIZE (*Zea mays* L.) CROPS

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Abstract

The aim of this study was to evaluate the effect of polyphenolic extract and deuterium depleted water (DDW) as bioregulators in maize (*Zea mays* L.) plant cultivation. The aqueous extract obtained from spruce bark (two levels of concentration), pure DDW and DDW in combination with spruce extract were used. The test solutions were applied by spraying and the maize plant growth and alelopatic effect on the development were studied. The following specific plants parameters were monitored: growth and development of vegetative organs of the plant, photosynthesis rate, transpiration rate, sub-stomatal cavity CO_2 concentration. Photosynthetically active radiation (P.A.R.) incident on leaf surface, pigments photoassimilating content, total polyphenolic content and individual polyphenolic compounds content in maize leaves were determined. It was observed that the solutions applied triggers an intensification of metabolic processes in plants (photosynthesis, transpiration, pigments synthesis, sub-stomatal cavity CO_2 concentration) with an increase in crop production. Highest percentage of stimulation was recorded in the plant groups treated with only polyphenolic extract (130 mg/L) or in combination with DDW (96 mg/L). The supplementation of the growth medium with polyphenolic extract cause an increase in the amount of catechine and synapic acid in leaves, increasing defense capability and therefore improving plant growth and development.

Key words: bioregulators, deuterium depleted water (DDW), maize, spruce bark extract, polyphenols

Received: March 2012; Revised final: May, 2013; Accepted: May 2013

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