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CALLUS INDUCTION AND GROWTH IN DIFFERENT EXPLANTS OBTAINED FROM HAPLOPHYLLUM ROBUSTUM SEEDLINGS

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The genus *Haplophyllum* (Rutaceae) contains 70 species distributed from the Mediterranean to East Siberia which are perennial herbs with a pervasive smell. The plants are widespread in Central Asia and so have been commonly used for a long time in folk medicine by the local population. In the earliest scientific literatures such as the Canon Medicine by Avicenna, it is indicated that "sadb-ruta" (the name given to different *Haplophyllum* species) could be applied for treating different diseases [1]. Iran with 26 species of *Haplophyllum* 14 of them are endemic is a major center of endemism of this genus [2]. The presence of alkaloids with different chemical structures, including quinolones, furoquinolines, dihydrofuroquinolines, tetrahydrofuroquinolines and pyranoquinolones were indicated in Uzbek *Haplophyllum* species [3]. Here, the effects of two hormonal treatments on percentage of callus induction and the growth speed of induced calli which produced from different types of explants (leaf, stem and root) is studied. The seeds of *Haplophyllum robustum* were collected from Semnan province, surface sterilized and cultured on B5 medium for explants preparation. Produced explants were cultured in B5 medium supplemented with (1) Kin, IAA and NAA in total concentrations of 0.2, 0.5 and 0.5 mg/L respectively and (2) 2,4-D, Kin, IAA and NAA in total concentrations of 2, 0.2, 0.5 and 0.5 mg/L respectively. Callus induction in all types of explants was observed in both treatments, but the first treatment was more effective in callus induction and growth.

References

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EFFECT OF WATER DEFICIENCY AND NITROGEN APPLICATION ON *WITHANIA SOMNIFERA* MORPHOLOGICAL TRAITS AND ROOT YIELD IN TABRIZ REGION

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In order to study the effects of water deficiency stress on *Withania somnifera* morphological traits and root yield an experiment was performed in 2010. Field experiment was carried out by a split plot design with 3 replications. Main plot were in 2 levels (complete irrigation and water deficiency when 50% flowering until seed hulking stage and after that irrigation every 3 weeks), and sub plots were 2 levels (nitrogen fertilizer application up to 150 kg/ha, in two stages; 50% flowering and seed bulking and control without application). The results that obtained from data analysis of variance showed that irrigation significantly effect on plant height, root length, root diameter, root fresh and dry weight, percentage of dry matter and percentage of Withaferin A and so nitrogen application effect on plant height, root length, root diameter, root fresh and dry weight, percentage of dry matter and percentage of Withaferin A was significant. Interaction of irrigation and nitrogen on plant traits such as plant height, root dry weight, Teytophane, Nicotine, Tropine was significant. Results showed that in Tabriz region with drought and poor soil, every water and fertilizer deficiency led to decrease in yield and quality of *Withania somnifera*.

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