

## ALLELOPATHIC EFFECTS OF *PINUS NIGRA* ON GROWTH PARAMETERS OF *CARTHAMUS LANATUS*

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### ABSTRACT

Allelopathy is defined as the direct or indirect harmful or beneficial effects of one plant on another through the release of chemical compounds the environment. These chemicals (also called allelo chemicals) often have inhibitory or contributory effects on seed germination and plant growth (Bulut *et al.*, 2007). Previous researches showed that plant extracts from shrubs and tree can cause increase or reduced germination or growth of neighboring plants (Vandermast *et al.*, 2002). The objective of the present study was to evaluate the allelopathic potential of decaying pine needles on *C. Lanatus* growth parameters (chlorophyll content, leaf area and seedling dry weight), the experiments were performed in completely randomized design with three replication at Shiraz University Agricultural Research greenhouse. In this study use of the small plastic pots filled with decaying pine needle soil incorporation during autumn 2013. The experimental treatments were 0, 5, 9 and 12 g decaying pine needle per pots. The incorporation of *P. nigra* decaying tissue reduced growth and development of *C. lanatus* thus suggesting that toxic compounds were released from the pine tissue. Growth inhibition was dependent on proportional to the incorporation rate. The results of investigation showed a significant difference between control and other treatments. The chlorophyll content in *C. Lanatus* was significantly restricted in 5, 9 and 12 g/pot decaying pine needles and 29.96, 32 and 49.47% reduction compared to the control, respectively ( $P < 0.001$ ). Also, *C. Lanatus* leaf area showed a significant difference among 5, 9 and 12 g/pot compared to the control and were evaluated 5.17, 32.42 and 45.47% reduction, respectively ( $P < 0.0361$ ). Moreover, seedling dry weight of *C. lanatus* showed 11.97, 49.2 and 67.54% significantly reduction in 5, 9 and 12 g/pot compared to the control, respectively ( $P < 0.0882$ ). However, tall fescue (*festuca arundinacea*) root dry weight was significantly reduced 52.9% by the incorporation of decaying pine needle (*P. halepensis*) (Panayiotis *et al.*, 2005). Therefore, the greatest reduction in chlorophyll content, leaf area and seedling dry weight was observed at the high incorporation rate (12 g/pot) of the decaying pine needle tissue. The results of this study showed that the highest weed control efficacy can be achieved by application of high incorporation rate (12 g/pot) and no significant difference found between 5 and 9 g/pot decaying pine needle in growth parameters of *C. Lanatus*. Finally, the study clearly demonstrated that water soluble inhibitory substances were present within the pine needle tissues. The inhibitory substances had the potential to significantly affect *C. lanatus* growth parameters. Further research is needed to categorize other growth parameters *C. lanatus* in response to pine tissue inhibitory compounds in order to provide a useful to wild safflower management.

**Keywords:** Allelopathy , decaying pine, wild safflower, chlorophyll content, weed control

### REFERENCES

- Nektarios, P.A. Economou, G., and Avgoulas, C. 2005. Allelopathic effects of *Pinus halepensis* needles on turfgrasses and biosensor plants. Horticulture Science. 40. 246-250.
- Bulut, Y., and Demir, M. 2007. The allelopathic effects of Scots pine (*Pinus sylvestris* L.) leaf



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extracts on turf grass seed germination and seedling growth. *Asian Journal Of Chemistry*, 19.3169-3177.

Vandermaast, D. B., Van Lear, D. H., and Clinton, B. D. 2002. American chestnut as an allelopath in the southern Appalachians. *Forest Ecology and Management*, 165. 173-181.



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