



MAY ALLELOPATHIC COVER CROPS INHIBIT WEEDS SEEDLING ROOT DEVELOPMENT BY SUPPRESSING MYCORRHIZATION?

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Barley (*Hordeum vulgare* L.) and rye (*Secale cereal* L.) are commonly-used cover crops, whose allelopathic potential effect is well recognized. The scope of this research was to assess the allelopathic properties of their extracts on weed seed germination and root development. Moreover, on the basis of previous observation which revealed the presence of mycorrhizae in some weed species, we also wanted to verify if allelochemicals contained in barley and rye extracts (ACE) could affect mycorrhization of weed roots in the early stage of germination. Curly dock (*Rumex crispus* L.), one of the most widespread weed in temperate agro-ecosystems, was used as model plant. Under controlled conditions, the effect of ACE (25g_{fresh plant}/80ml_{H₂O}) at increasing dilutions was assessed on curly dock, by determining the percentage of seed germination, seedling root length and germinated seed weight, compared to control (water). Curly dock roots were also stained/destained and observed by optical microscope, in order to evaluate the effect of ACE on potential mycorrhization. Results indicated that ACE did not significantly affect curly dock seed germination and germinated seed weight. However, the application of ACE determined no weed root elongation, or its significant decrease respect to the untreated control in the less and more diluted treatments, respectively. Moreover, microscopic analysis evidenced a significant reduction of the early-stage endomycorrhization of curly dock roots after ACE treatments. These findings suggest that a plant, able to naturally synthesise allelochemical compounds, can influence weed presence and growth by entailing a wide suite of physiological mechanisms, which involve also mycorrhization and regulate the crop-weed interference.