



# **BOOK** of **ABSTRACTS**

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## Toward alternative herbicides: ethanol and indole-3-acetic acid in the suppression of plant growth

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Modern agriculture relies heavily on the use of synthetic herbicides: however, although efficient, these chemicals are also harmful to the environment. Therefore, there is an ever-increasing need for alternative herbicides: ethanol and indole-3-acetic acid (IAA) are among the candidates. Ethanol can be cheaply produced from a vast variety of substrates in large-scale fermentation processes. Moreover, in the last 2 decades, its applicability as an alternative, biosustainable herbicide is also being recognized. Ethanol has a well-known phytotoxic effect, although its mechanisms of actions are still poorly understood. IAA, a plant phytohormone, exerts its negative effect when applied in higher doses. Each plant has different sensitivity to ethanol and IAA. This property can be used to suppress the growth of harmful species (e.g. weeds) while stimulating the growth of desired cultures. In this study, we tested the effects of IAA and ethanol on duckweeds (*Lemna minor* L.). We measured non-enzymatic parameters of oxidative stress and multiplication rates of duckweeds exposed to IAA and to ethanol, respectively. Our results showed that higher concentrations of IAA ( $>1 \text{ mg l}^{-1}$ ) suppress the growth of duckweeds while even small amounts of ethanol (0.5% and 1% v/v) were sufficient to reduce the growth and biomass production of duckweeds. In conclusion, ethanol and IAA can exert significant negative effects on plant growth, at least in part by increasing oxidative stress in plants, and can therefore be potentially used as low-cost, eco-friendly herbicides.

**Keywords:** herbicides, IAA, ethanol, duckweed

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