



# Effect of the Aqueous Extract of Mastic Tree (*Pistacia lentiscus* L.) on the Germination and Early Growth of Beggarticks (*Bidens subalternans* DC.)

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## INTRODUCTION

Invasive plant species represent a major ecological and economic challenge in agriculture and biodiversity conservation due to their rapid spread and suppression of native vegetation. One such species is *Bidens subalternans* DC., an invasive weed originating from South America that has spread across many parts of Europe and competes aggressively with cultivated and native plants. In contrast, *Pistacia lentiscus* L., a Mediterranean evergreen shrub, is rich in bioactive compounds with documented antioxidant, antibacterial, phytotoxic, and potentially allelopathic properties. Allelopathy, based on the action of plant secondary metabolites on neighboring species, is increasingly being investigated as an environmentally friendly approach for sustainable weed management and invasive species control. The aim of this study was to evaluate the allelopathic potential of aqueous extract of *Pistacia lentiscus* as a natural product for the biological control of weeds. The effect of aqueous extracts at concentrations of 20%, and 30% on germination and early growth and development of *B. subalternans* was evaluated through two experimental phases. The purpose of the study was to demonstrate the potential use of *P. lentiscus* extract as a bioherbicide and to promote the application of environmentally sustainable plant protection products.



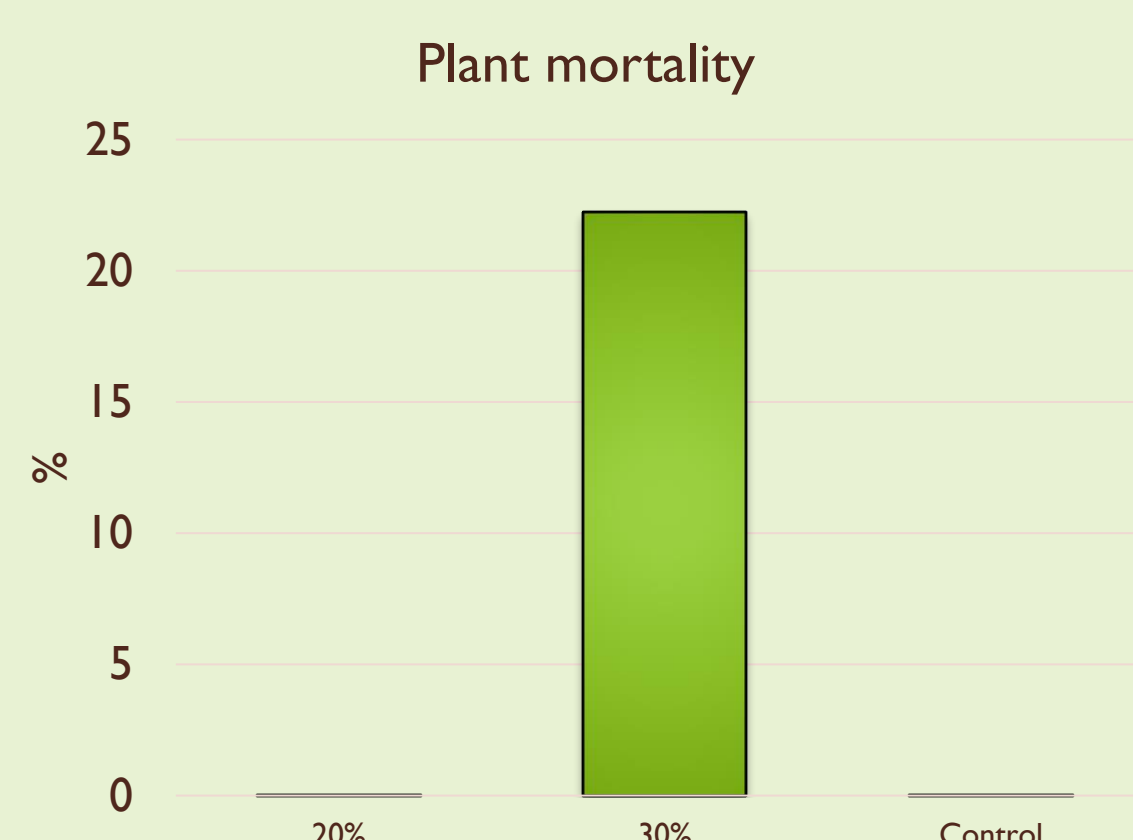
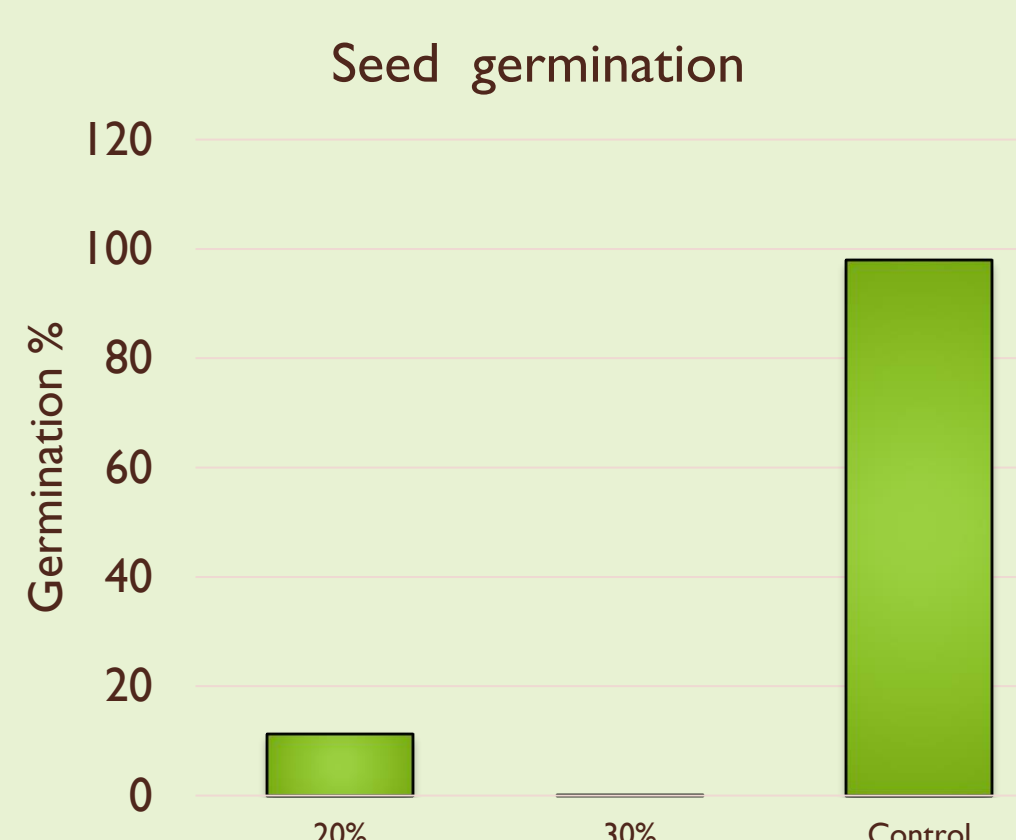
## MATERIALS AND METHODS

Plant material was collected in the coastal area of Zadar County, Croatia. *Pistacia lentiscus* leaves were air-dried for 10 days in a dry and ventilated place and subsequently ground using an electric grinder. A total of 100 g of dry plant material was added to 1000 mL of distilled water and left for 24 h with occasional stirring. After filtration, the obtained aqueous extract was diluted with distilled water to concentrations of 20% and 30%.

## RESULTS

The results of this study indicate a pronounced inhibitory effect of aqueous *Pistacia lentiscus* extract on the germination and early development of the invasive weed species *Bidens subalternans*. Seed germination inhibition was observed and increased with higher extract concentrations. At the 20% concentration, germination was reduced to 11.1%, while the 30% concentration completely inhibited germination (0%). In addition to the significant effect on germination, a delay in the initial germination phase was also observed in the treated groups.

A negative effect of the extract on emerged seedlings was also recorded. Stress symptoms in plants treated with the 20% extract were mild; however, plants treated with the 30% extract showed loss of turgor, severe wilting, and necrosis of aboveground plant parts, with a plant mortality of 22.2%.



## CONCLUSION

These findings confirm the possible negative allelopathic effect of *P. lentiscus* extract on the germination and early growth of *B. subalternans*. The results suggest the potential application of *P. lentiscus* extract in biological weed control. However, before wider practical application, further studies under field conditions are needed, including selectivity testing on other plant species and non-target organisms, as well as evaluation of long-term environmental effects.

## ACKNOWLEDGMENT

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