Allelopathic Potential of *Jasminum Officinale* on Weed Species

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Abstract

Allelopathy is generally defined as any direct or indirect harmful or beneficial effect of one plant on another mediated by the production allelochemicals. The scope of this study was the evaluation of the potential allelopathic effect of *Jasminum officinale* against some weed species. The effects of extracts obtained from root, stem and leaves of *J. officinale*, were evaluated against ragweed (*Ambrosia artemisiifolia*), ryegrass (*Lolium perenne*), and Johnsonn grass (*Sorghum halepense*). The aqueous leachates of jasmine demonstrated promising allelopathic potential by inhibiting seed germination and radicle elongation of all tested species. The best results were observed against Johnsonn grass, with the leaves extract strongly inhibiting the germination rate, while the roots extract inhibited the radicle elongation. The more profound research in the field of allelopathy will eventually lead to the development of bioproducts designed for pest or weed control using allelochemicals.

Keywords: *allelopathy, plant-plant interaction, inhibiting effect*

INTRODUCTION

Allelopathy is defined as harmful or beneficial effect of one plant on another mediated by the production of chemical compounds, called allelochemicals, which are released into the environment [Lehoczky *et al.*, 2011; Latif *et al.*, 2017]. Release of these allelochemicals, was already demonstrated as a major factor in regulating the plant communities structure in both natural and agroecosystem. Over the time, research on allelopathy principles demonstrated its potential for weeds biological control [Cheng and Cheng, 2015' Worthington and Reberg-Horton, 2013].

This paper reports studies performed for the evaluation of potential allelopathic effects of *J. officinale* on common weed species.

MATERIALS AND METHODS

The effects of different plant parts of *J. officinale*, namely root, stem and leaf, were assessed

against the seed germination, emergence and radicle elongation, and coleoptile length of common weed species growing on agricultural lands: ragweed (*Ambrosia artemisiifolia*), ryegrass (*Lolium perenne*), and Johnsonn grass (*Sorghum halepense*).

The aqueous extracts were prepared with distilled water, by maceration for 24 hours at room temperature. The weeds seeds were placed in 90 mm Petri dishes lined with filter paper. The filter paper was moistened with jasminum extract or distilled water as control. To avoid evaporation, the Petri dishes were covered with parafilm before pressing the top cover. The dishes were maintained at 23°C with fluorescent light for 24 hours.

RESULTS AND DISCUSSIONS

The aqueous extracts of different plant parts of jasmine demonstrated promising allelopathic potential by inhibiting seed germination and radicle elongation of all tested species (Figure

Figure 1. Effect of *Jasminum* extracts on weeds germination

Figure 2. Effect of *Jasminum* extracts on weeds radicle elongation

Figure 3. Effect of *Jasminum* extracts on weeds coleoptile length

1-3). However, the weed species showed different responses to the treatment with exudates of *J. officinale*. The highest inhibition was observed against Johnsonn grass, with the leaves extract strongly influencing the germination rate, while the roots extract inhibited the radicle elongation.

CONCLUSIONS

The essential role that allelochemicals play in complex interactions in the environment is being currently elucidated in the scientific progress of humanity. The more profound research in this field will eventually lead to the development of bioproducts designed for pest or weed control using allelochemicals.

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