

Allelopathic activity of *Hosta alismifolia* against *Lactuca sativa* L.

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Summary Allelopathy of common plants is being investigated by researchers around the world over the years. However, there is little research done on allelopathy of *Hosta* spp. In this study, the inhibitory properties of *Hosta alismifolia* were investigated. Aerial parts of the plants were collected from Kochi prefecture, Japan, and air dried. Water extractions of the dried materials were performed to produce four (0.5%, 1%, 2% and 4%) concentrations. A laboratory bioassay was performed where *Lactuca sativa* L. was used as the receiving plant. The results show that, water extract had significant inhibition against lettuce germination and growth. The water extracts induced physiological changes on lettuce seedlings, reducing amounts of chlorophylls, and carotenoids. Shoot length inhibition was 13.85% and 93.24% over control at 2% and 4% concentrations, respectively. In case of root length all concentrations had significant

inhibition over control (51.33%, 69.42%, 89.46% and 99.28% inhibition over control at the 0.5, 1, 2 and 4% concentrations, respectively). High-performance liquid chromatography analysis revealed presence five major phenolic acids namely protocatechuic acid, *p*-hydroxybenzoic acid, ferulic acid, *p*-coumaric acid, benzoic acid and ellagic acid. Among the five detected phenolic acids, ferulic acid content was the highest (2.07 mg g⁻¹ dry weight) in amount followed by benzoic acid (0.88 mg g⁻¹ dry weight). Further bioassays using the detected phenolics to reveal their allelopathic effects against lettuce are to be performed. The results indicate *Hosta alismifolia* plant contains plant growth inhibitors and can be potentially used for biological weed control.

Keywords Allelopathy, phenolics, *Hosta alismifolia*.