Does Allelopathy escalate invasiveness of Prosopis juliflora (Sw.) DC in arid land environment?

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Abstract

Prosopis juliflora is highly recognized for its invasive character and its detrimental effects on plant species due to the release of allelochemicals. From a preliminary investigation, we found that the number of seedlings of *P. juliflora* is 10-20 folds greater than other shrubby trees encountered in the area. In this research we aimed to assess the allelopathic effects of crude water extracts of *P. juliflora* on selected Qatari flora. Effects on germination of lettuce seeds indicated strong-dose-dependent allelopathic effects. The results on native Qatari flora showed that seed germination and/or radicle length of: *Acacia tortilis, P. cineraria, Sueda aegyptica, Halopeplis perfoliata, and P. juliflora* were affected differently due to different treatment levels. While 10% of significant reduction exerted on seed germination of *P. cineraria* only at higher concentrations (6 - 8 mgml-1), the seed radical length was significantly reduced starting at the lowest concentration (2 mgml-1) and with significant greater reduction at higher concentrations. The seed germination and seed radical length of *Sueda aegyptica* were significantly decreased (_˜ 50%) at 4 mgml-1 crude water extract of *P. juliflora.* Autotoxic effects of *P. juliflora* were also observed at higher concentrations of 6mgml-1and 8mgml-1. Seed germination of *C. imbricatum* was significantly reduced after treatment with the leaf-soil leachate of *P. juliflora.* The aqueous leaf extract of *P. juliflora* was also tested on seedlings of native Qatari plants. The seedlings growth of *Aeluropus lagopoides, C. imbricatum* and *Tetraena qatarensis* were all impacted upon treatment. The seedling growth and dry biomass of *C. imbricatum* were significantly declined at higher concentration of 8mgml-1. However, the seedling growth and dry biomass of *Tetraena qatarensis* were significantly reduced at all treatment concentration levels. *P. juliflora* is an invasive and has detrimental effects on associated native plants and establishing a proper management plan of this plant is imperative.

Keywords: Prosopis juliflora, Invasive species, arid land, Qatari flora, seed germination, seedlings.

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