

Does allelopathy increase 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 different plant species across the world due to possessing allelochemicals. Our field observations indicated high prevalence of new recruitments of *P. juliflora* than other native associated plants in the study site. The purpose of this study is to assess the allelopathic effects of aqueous extracts of *P. juliflora* on selected Qatari flora. 100 g L⁻¹ of powdered of plant leaves was used to prepare the stock extract and then diluted to reach the following concentration: 2 mg ml⁻¹, 4 mg ml⁻¹, 6 mg ml⁻¹ and 8 mg ml⁻¹ from stock were prepared. *Acacia tortilis*, *Prosopis cineraria*, *Sueda aegyptica*, and *Halopeplis perfoliata*, were negatively impacted by aqueous extract at different treatment levels. The results showed that although seed germinations of *Acacia tortilis* was not significantly affected by the extract, however a significant reduction was observed in radical lengths starting from a concentration as low as 2 mg ml⁻¹. While low significant reduction (10%) was exerted on seed germination of *Prosopis cineraria* at higher concentrations of 6 mg ml⁻¹ and 8 mg ml⁻¹, the seed radical length was significantly reduced starting at the lowest concentration (2 mg ml⁻¹). The seed germination and seed radical length of *Sueda aegyptica* were reduced by almost 2-folds at the lowest concentration treatment (2 mg ml⁻¹). Seed germination of *Halopeplis perfoliata* was also reduced significantly at concentration of 4 mg ml⁻¹. Seedlings growth of *Aeluropus lagopoides*, *Caroxylon imbricatum* and *Tetraena qatarensis* were also evaluated after being subjected to *P. juliflora* extract. Although no significant differences in plant height of *Aeluropus lagopoides* occurred due to treatments, significant reduction in dry matter biomass were found at concentrations of 6 mg ml⁻¹ and 8 mg ml⁻¹ of extract compared to control plants. The seedling growth and dry biomass of *Caroxylon imbricatum* were significantly declined at higher concentration of 8 mg ml⁻¹. However, the seedling growth and dry biomass of *Tetraena qatarensis* were significantly reduced at all treatment levels. Autotoxic effects of *P. juliflora* were also observed at concentrations of 6 mg ml⁻¹ and 8 mg ml⁻¹. Based on the research carried out, *P. juliflora* is invasive and utilize allelopathy as one major tool of its invasiveness. The species has detrimental effects on the Qatari native flora, and it is important to protect them from the growing spread of this invasive species.

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