

**Abstract No: BO-12**

**Investigating the competitive ability of endemic *Osbeckia octandra* with its co-occurrence with invasive *Sphagneticola trilobata* and native weed, *Urena lobata***

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In Sri Lanka, *Osbeckia octandra* (L) DC. is a widely used valuable endemic herb in Ayurvedic medicine, popular natural remedy among Sri Lankans and an important pollinator plant. Their local populations are disappearing rapidly due to various anthropogenic activities. Further, local roadside habitats of some *O. octandra* populations are under the threat of invasion by several exotic and native weedy species. When the competition exerted by those competitively superior invasive and weedy species become severe, *O. octandra* populations can be threatened for extinction. Thus, the present study was carried out to investigate the competitive ability of *O. octandra* with its co-occurring exotic invasive *Sphagneticola trilobata* (L.) and native weedy *Urena lobata* (L.) species under soil water and nutrient gradients. Pot experiments were conducted with *O. octandra* monocultures as controls and *O. octandra* mixed-cultures with either *S. trilobata* or *U. lobata* as experimental pots to study the inter-specific competition for soil nutrients under three different nutrient levels (low, moderate and high) and for soil water, under two different water availabilities (well-watered and water-stressed). One set of 12 pots (4 pots of *O. octandra*/*S. trilobata*; 1:1 pots+ 4 pots of *O. octandra*/*U. lobata* 1:1 pots+ 4 pots of control pots) was prepared for every assigned nutrient and watering condition. After a five-month experimental period, the mean values of final plant heights, fresh weights, above and below ground dry biomasses of *O. octandra* plants were recorded and obtained data were analyzed by Analysis of Variance (Two-way ANOVA,  $P < 0.05$ ) and Tukey's pairwise comparison using the MINITAB 17 statistical software. According to the results, *O. octandra* plants in monocultures have performed better than the *O. octandra* from mixed cultures under all the tested different nutrient and water availability conditions, indicating that invasive *S. trilobata* and weedy *U. lobata* have significantly higher competitive abilities over endemic *O. octandra* along with the soil nutrient and water continua ( $P < 0.05$ ). Having significantly lower root biomass of *O. octandra* in mixed cultures compared to the monoculture under low nutrient condition ( $P < 0.05$ ), revealed that *O. octandra* has a low phenotypic plasticity. Also, our results revealed that non-invasive *U. lobata* was equally competitive as invasive *S. trilobata* against *O. octandra* under different soil nutrient conditions. Moreover, *S. trilobata* exerted a significantly higher competition than by *U. lobata* on *O. octandra* under well-watered condition ( $P < 0.05$ ), while under water stressed condition *U. lobata* exerted a significantly higher competition than by *S. trilobata* ( $P < 0.05$ ). Our results clearly shown, that the native weedy *U. lobata* has a potential to become invasive locally as *S. trilobata* in future, and suppress the growth of native, less competitive flora. Thus, further studies on invasiveness of native weedy species on endemic species will be needed to investigate.

**Keywords:** Competitive ability, Endemic, Invasive species, Weedy