

## COMPETITIVE RESPONSE AND PLASTICITY OF *CLIDEMIA HIRTA* GROWN WITH *ELEUTHERANTHERA RUDERALIS*

I. P. K. PIYASINGHE AND H. M. S. P. M. WEERASINGHE

*Department of Botany, Faculty of Science, University of Peradeniya*

In Sri Lanka, both natural and semi-natural ecosystems are threatened by the invasion of alien plant species. Invasion of non-native plant species is a widespread management concern because of their detrimental effects on the biodiversity and the economic consequences of invasions. Invasive plants seem to possess higher competitive ability than native plants. Also, when plants are in competition, they tend to adjust their plastic responses through morphological, physiological and architectural adaptations. Understanding the ecophysiology of invasive plants is an important step towards the introduction of management strategies.

The competitive response and morphological and architectural plasticity of the invasive *Clidemia hirta* grown with the non-invasive weed, *Eleutheranthera ruderalis* was investigated using a pot experiment. Three treatments were used in the experiment; monocultures of *C. hirta* and *E. ruderalis* and a mixed culture of both plant species. Seedlings of similar age of each plant species were collected from roadsides at Hantana. In each pot 6 seedlings (in the mixed culture treatment 3 seedlings of each species) were grown equidistant to each other in a hexagonal design. Each treatment comprised ten pots. Half of the pots (filled with soil and sand in a ratio of 1:4) in each treatment was enriched with nutrients and the other half was kept un-enriched. Plants were harvested after 2 months. The fresh and dry weights of root and shoot were recorded and the growth rate, root weight ratio and root to shoot ratio were calculated. Scanned roots were analyzed using WinRhizo software programme for specific root length.

*Clidemia hirta* showed a higher morphological and architectural plasticity in the root system when exposed to inter-specific competition with *E. ruderalis* in the low fertile soil environment. In contrast, the plastic responses shifted to the shoot system of *E. ruderalis* when the plants were exposed to fertile conditions. Results indicated that the plastic responses observed were triggered when the plants competed with a different plant species. *Eleutheranthera ruderalis* showed a significantly higher growth when exposed to inter-specific competition with *C. hirta* than to intra-specific competition. Similarly *C. hirta* showed a higher performance under mixed culture compared to mono culture, though the difference was not significant. Neither species out competed the other when grown together. Even though *E. ruderalis* is considered as non invasive, it seems to have a higher competitive response than *C. hirta* under enriched conditions.