



209/B

Influence of *Clidemia hirta* and *Chromolaena odorata* leaf extracts on seed germination, seedling growth and growth performance of *Raphanus sativus* L. (Radish)

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Clidemia hirta (Katakaluwa) and *Chromolaena odorata* (Podisinnomaran) were introduced into Sri Lanka as ornamental plants but now they have become invasive species. The present study was aimed at finding the influence of *C. odorata* and *C. hirta* extract on seed germination, seedling growth and their potential uses as a liquid fertilizer to enhance the growth and yield performance of local Radish (*Raphanus sativus*) cultivar "Beeralu". In the laboratory different concentrations (25, 50, 75, 100 g L⁻¹) of aqueous leaf extracts which was prepared separately by pooled samples of randomly selected plants of *C. odorata* and *C. hirta* were tested for seed germination and seedling growth of Radish using petri dishes (four replicates for each treatment containing 20 seeds in each petri dish) and seed trays (eight replicates for each treatment and sand as the growth medium) by adding 10 mL of the test extract. Distilled water was used as the control. Different concentrations (25, 50, 75, 100 g L⁻¹) of leaf extracts were tested with five replicates for each concentration, for growth and yield performance of *R. sativus* seedlings using pots containing 3 kg of solarized soil mixture in the pot experiment. The pots were treated with 300 mL of the extract every other day. The pots were arranged according to the randomized block design in an open environment in the Warakapola area and root and shoot fresh weights, leaf area, girth of the roots, length of the leaves and roots, number of leaves were recorded 45 days after seed sowing. Data were analyzed with MINITAB 16 statistical software (ANOVA ($p < 0.05$) and Tukey's pair wise comparison tests). The laboratory experiment results showed that seed germination, root and shoot lengths of Radish were significantly reduced by both leaf extracts compared to the control. Higher degree of seed germination inhibition and the shortest mean shoot and root lengths were recorded with increasing concentrations of extracts and therefore inhibition was dose dependent and it could be due to the presence of allelochemicals in the leaf extracts. In the field experiment addition of leaf extracts on germinated seedlings indicated significantly higher mean shoot and root biomasses in the presence of 75 g L⁻¹ *C. odorata* and 25 g L⁻¹ *C. hirta* treatments than their control (One way ANOVA, $p < 0.05$). Higher concentrations of *C. hirta* extracts (>50 g L⁻¹) have shown reduction in the yield performance of *R. sativus*. In *R. sativus* higher growth and yield performance was recorded in *C. odorata* 75 g L⁻¹ treatment.

Keywords: Allelochemicals, *Clidemia hirta*, *Chromolaena odorata* germination and growth performance, *Raphanus sativus*