

Abstract

Coccinia grandis is a plant species commonly found in tropical areas, such as Indonesia. While *C. grandis*, also known as ivy or scarlet gourd, is recognized as a medicinal plant, the species is invasive due to its rapid growth, preventing nutrient absorption by the nearby plant community. To solve this invasiveness, *C. grandis* can be employed as a source of phytochemicals for herbicide development, such as flavonoids, glycosides, terpenoids, phenolic compounds, and saponins. The bioherbicidal leaf extract of *C. grandis*, obtained through Soxhlet extraction, was tested against soil-grown dicot and monocot model plants, *Nicotiana tabacum* and *Brachiaria humidicola*, using the foliar spray method. The results from 14-days cultivation showed that the application of leaf extract during pre-emergence state yielded the highest percentage inhibition, with the two plants inhibited by 62.41% and 89.86%, respectively, at a 30% (w/v) extract concentration. These are significantly different from those obtained from post-emergence treatment, which were 65.57% and 55.56%, respectively. The results further indicated a more significant impact of *C. grandis* leaf extract on monocotyledonous plants, resembling grass-type weeds, than dicotyledonous plants. The application of leaf extracts also affected the overall biomass weight, with a significant decrease observed in the pre-emergence treatment compared to the post-emergence treatment, yielding p-values of <0.0001 for both model plants. The results of this study propose the potential of *C. grandis* as a bioherbicide, an alternative for sustainable weed management in the fight against the rise of herbicide resistance.

Keywords: *Coccinia grandis*, bioherbicide, *Nicotiana tabacum*, *Brachiaria humidicola*, allelopathic compounds