

HERBICIDAL PROPERTIES OF INVASIVE ALIEN PLANTS *Ageratina riparia* AND *Austroeupatorium inulifolium* AGAINST *Brassica juncea*

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Synthetic herbicides cause harmful effects on human health and the environment, and therefore, the importation of agrochemicals has been banned recently in Sri Lanka. Invasive alien plants (IAPs) spread aggressively, threatening ecosystems, biodiversity and crops. A strategy to resolve the problems of synthetic herbicides and the uncontrolled spread of IAPs is to develop eco-friendly plant-based herbicides from IAPs. Accordingly, two IAPs, *Ageratina riparia* (Regel) R.M. King & H. Rob. and *Austroeupatorium inulifolium* (Kunth) R.M. King & H. Rob. were evaluated for their herbicidal properties against *Brassica juncea* (L.) Czern. The dry leaf powders, prepared from the two IAPs, were separately extracted into dichloromethane-methanol (1:1) using a bottle extractor. The leaf powders and the concentrated leaf extracts were tested for their inhibitory effects on seed germination and early seedling growth (shoot length, root length and biomass) of *B. juncea* in a Petri dish assay using 2-methyl-4-chlorophenoxyacetic acid (MCPA) and glufosinate ammonium as positive controls and distilled water and aqueous dimethyl sulfoxide as negative controls. Each treatment was carried out on 25 seeds in four replicates in three trials. The IC₅₀ values of *A. riparia* and *A. inulifolium* leaf powders were 0.81 ± 0.07 mg cm⁻² and 0.60 ± 0.13 mg cm⁻², respectively; the corresponding values for *A. riparia* and *A. inulifolium* leaf extracts, in equivalent leaf powder, were 0.48 ± 0.04 mg cm⁻² and 0.52 ± 0.04 mg cm⁻², respectively. Leaf powders (at 1.76 mg cm⁻²) and extracts of *A. riparia* (at 0.95 mg cm⁻² equivalent leaf powder) and *A. inulifolium* (at 0.74 mg cm⁻² equivalent leaf powder) were more potent than the commercial herbicides glufosinate and MCPA (at concentrations recommended for field use). Growth parameters of *B. juncea* seedlings decreased with increasing amounts of leaf powders and extracts of both IAPs. The two IAPs *A. riparia* and *A. inulifolium* are potential sources for developing plant-based herbicides.

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