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Comparison of the effects of a broad-spectrum herbicide and a bio-herbicide on insect flower visitation in the Serengeti ecosystem, Tanzania

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Abstract

The functional role of insect visitors on flowering plants is crucial to both natural and agricultural ecosystems. While, few studies have addressed the impact of invasive plant species on insect visitors, even less is known about how management practices against invasive plants may affect plant-pollinator interactions. We assessed how natural versus chemical-based management against the invasive plant *Gutenbergia cordifolia* affected insect visitors in Mwiba area, Tanzania. We compared the number of insect visitors, diversity and richness, the number of inflorescences visited, inflorescences abundance and flower diversity across treatments of *Desmodium uncinatum* crude leaves extract (DUL), the chemical glyphosate (GLY), and none /control (CON). We found that more than half (55%) of the insect visitors observed were found visiting flowering plants in DUL plots, followed by CON with 26% and GLY plots with 19%. Further, DUL plots had almost twice as many inflorescences visited compared to CON and GLY plots. Inflorescence's abundance and flower diversity were significantly higher in DUL plots compared to CON and GLY plots. Our study revealed that DUL treatment did not disrupt insect flower visitation but rather attracted more insects. We conclude that using the natural plant extract treatment is highly preferable to the chemical management of invasive plants such as *G. cordifolia*, as the DUL treatment maintained and even enhanced flower diversity while suppressing *G. cordifolia* and fostering insect visitors.

Keywords

Desmodium uncinatum plant extract; Glyphosate; Savanna; Weed; Pollinators