

Chromolaena odorata Extracts as a Bio-Organic Treatment for Downy Mildew (Peronospora belbahrii) in Basil (Ocimum basilicum)

ABSTRACT

Downy mildew, caused by *Peronospora belbahrii*, poses a significant threat to basil (*Ocimum basilicum*) crops. This study investigates the potential of *Chromolaena odorata* extract as a bioorganic therapy for Downy Mildew. The goal of this research-based innovation is to determine the long-term and environmentally friendly potential of *C. odorata* extract as an alternative to synthetic fungicides for controlling Downy Mildew in basil, thereby contributing to SDGs 2 (Zero Hunger), 3 (Good Health and Well-being), and 15 (Life on Land). The leaves of *C. odorata* were collected and extracted, and the bioorganic solution produced was tested for antifungal efficacy against *P. belbahrii*. Next, *C. odorata* extracts at their respective concentrations (0.0001 g/mL, 0.0002 g/mL and 0.0003 g/mL) were applied to the assigned plants within each block using the Randomized Complete Block Design (RCBD) with three replicates per treatments. During field investigations, *C. odorata* extract demonstrated significant antifungal activity against *P. belbahrii*. The findings suggest that *C. odorata* extract has potential as a bio-organic treatment for Downy Mildew, which is consistent with SDG 12 (Responsible Consumption and Production) by supporting sustainable farming practices that reduce reliance on chemical inputs. This innovation is vital to modern farmers, particularly social enterprise entrepreneurs, as it facilitates healthy basil cultivation. In a nutshell, the *C. odorata* extract has been evaluated for its efficacy in controlling mildew disease and has the potential to be commercialized and marketed.