



INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS



Name of the Student : HEENA KAUSER
Roll Number : 176154002
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Name of Thesis Supervisor(s) : Dr. Meena Khwairakpam
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SHORT ABSTRACT

Mikania micrantha Kunth is an abhorrent weed that destroys agricultural output. *Mikania micrantha* removal by biological, chemical, or mechanical means is still unsuccessful. Studies were carried out on the possible use of terrestrial weed *Mikania micrantha* biomass using three different composting technologies. Four phases were carried out to accomplish the objectives. In the first phase Rotary drum (RD2) showed the highest Total Kjeldahl Nitrogen at the end of the 20th day. In the second phase of the study earthworm species, *Eisenia fetida*, *Eudrilus eugeniae*, and *Perionyx ceylanesis*, were used to create a 60-day cycle of vermicomposting process. Among all, *E. fetida* showed a successful growth rate with less mortality rate. However, vermicomposting takes longer time although the quality is better than that of rotary drum composting. In order to shorten the time period of vermicomposting process, two-stage composting technologies was formulated which proven to be best in time reduction and produce mature, stable, and nutrient-rich compost that is more superior quality than conventional rotary drum compost. Toxicity testing has shown the compost quality and its safe usage in soil for plant growth. The application of compost/vermicompost in various ratios to soil has a significant influence on okra plant development, suggesting that *Mikania* compost may be utilized in the field. A microbiological investigation revealed the usage of bacterial inoculum for allelochemical breakdown throughout the composting process. The primary problems of utilizing weed are handling in bulk amount and storage issues. The allelochemical impact is also important since this is the major toxic molecule present in the plant that must be destroyed throughout the procedure. *Mikania* compost can be made onsite by farmers rather than dumping in an open area, and the utilization of this specific biomass will assist them in making their own compost/vermicompost to be used as an organic fertilizer, as well as finding a sustainable livelihood by selling the product.