INDIAN INSTITUTE OF TECHNOLOGY GUWAHATI
SHORT ABSTRACT OF THESIS

Name of the Student	:	Mayur Shirish Jain
Roll Number	:	156104004
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Name of Thesis Supervisor(s)	:	Dr. Ajay S Kalamdhad
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SHORT ABSTRACT

Hydrilla verticillata (L.f. Royle) is a troublesome aquatic weed and is found globally. It is also called as noxious aquatic weed due to its rapid growth rate and significant uptake of nutrients. The complete removal of *Hydrilla verticillata* from the aquatic bodies by biological, chemical or mechanical means are still unsuccessful. Composting is the best alternative method to manage this weed but its high moisture levels and lower carbon: nitrogen ratio is the limiting factors that may affect the composting process and thus the quality of the final product. The presence of high moisture content during the process negatively impacts microbial activity as well as hinders aeration, and in the compost, it affects the porosity of the soil after agricultural land application. Similarly, lower carbon: nitrogen ratios in the wastes are susceptible to higher nitrogen loss due to the ammonia volatilization. Thus the moisture content and carbon: nitrogen ratios of wastes play an essential role in the composting process as well as the quality of the end product. Therefore, studies were carried out on the utilization of *Hydrilla verticillata* as a substrate in a rotary drum composter mixed with fresh cow dung and sawdust. Five different proportions (Trials 1 (5:4:1), 2 (6:3:1), 3 (7:2:1), 4 (8:1:1) and 5 (10:0:0)) of *Hydrilla verticillata*, cow dung and sawdust were prepared for the composting process. The study results concluded that the appropriate proportion of *Hydrilla verticillata*, cow dung and sawdust (Trial 4) could produce quality compost in the rotary drum composter. But the moisture content has the substantial impact on the physical properties along with the biological and chemical properties and should not be neglected during compost application. An appropriate proportion of biochar (5%) addition during the composting process enhanced the organic matter degradation, reduced the moisture content and improved overall physical quality of the compost. The compost prepared from *Hydrilla verticillata* + biochar is useful to improve the overall soil health. This study further recommends compost application at the rate of 20 and 30% to the alluvial and laterite soil, respectively.