عنوان مقاله:

Study of physico-chemical and biochemical parameters during rotary drum composting of water hyacinth

محل انتشار:

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نویسندگان:

D Sarika - *Department of Civil Engineering, Indian Institute of Technology Guwahati (IITG), Guwahati 781039, Assam, India*

Jiwan Singh - *Department of Civil Engineering, Indian Institute of Technology Guwahati (IITG), Guwahati 781039, Assam, India*

Ravi Prasad - *Department of Civil Engineering, Indian Institute of Technology Guwahati (IITG), Guwahati 781039, Assam, India*

Isha Vishan - *Department of Civil Engineering, Indian Institute of Technology Guwahati (IITG), Guwahati 781039, Assam, India*

خلاصه مقاله:

Background Water hyacinth (Eichhorniacrassipes) is oneof the most uncompromising weeds in the whole world. Itsadverse effects due to fast growth rate are main physicalinterference with fishing and navigation. Water hyacinthalso causes eutrophication due to the large release oforganic nutrients after its degradation, consequentiallydeterioration of water quality and also adversely affectingaquatic flora and fauna. Therefore, composting is one of thebest methods for control and utilization of water hyacinth.Water hyacinth being the plant material is rich in cellulose,hemicellulose, and lignin content which hinders the rate ofdegradation during composting. The raw materialsincluding water hyacinth along with sawdust and cattlemanure in five different proportions trial 1 (10:0:0), trial 2(8:1:1), trial 3 (7:2:1), trial 4 (6:3:1), and trial 5 (5:4:1)were composted using rotary drum composter.Results Final product of water hyacinth composting wasflourishing of nutrients such as nitrogen, phosphorus,sodium, potassium, calcium, and magnesium. The ligninreduction in all the five trials was obtained between 10 and40 %. The reduction in cellulose was observed rangingfrom 4 to 55 % in different trials. Similar as cellulose andlignin, hemicellulose was also reduced about 11–46 % inall five trials during the process.Conclusion The maximum reduction inorganic matter,lignin, cellulose and hemicellulose was observed in trial 4;whereas, the nutrient contents (nitrogen, phosphorus, Na,K, Ca, and Mg) were increased significantly during theprocess. On analyzing the FTIR results, trial 4 showed thataliphatic and polysaccharides have easily degraded andaromatic compounds have increased with composting timein trial 4.

کلمات کلیدی:

Water hyacinth Rotary drum composter Lignin Cellulose Hemicellulose Reducing sugars