International Journal of Advance and Applied Research
www.ijaar.co.in
ISSN – 2347-7075 Impact Factor – 7.328
Peer Reviewed Bi-Monthly
Vol.10 No.4 Mar – Apr 2023

Biodegradation of Obnoxious Vegetation through Vermicomposting

Dr. Jyoti Uikey
Sarojini Naidu Girls Government Autonomous P.G. College Bhopal, Madhya Pradesh
***Corresponding Author* - Dr. Jyoti Uikey**
Email: jyotiuikey91609@gmail.com
DOI- 10.5281/zenodo.7791019

Abstract
To evaluate the effectiveness of various obnoxious vegetation's biodegradation. Huge amounts of biomass in our ecosystem come from these plants. Experiments were conducted on the partial breakdown of four toxic plants: water hyacinth, lantana, and Parthenium (Parthenium hysteropherus L.) (Eichhornea crasspes L.). Conversion of this enormous biomass into organic manures using various vermicomposting techniques. These tests were conducted in tarasevaniya dairy farms, Bhopal, from January to April of 2023. 4 additives, including fresh cow dung (a), were added to an equal amount (4 kg on a dry weight basis) of fresh biomass from each of these 4 vegetations and subjected to partial aerobic decomposition for 5 weeks each. Before earthworm incubation, use Trichoderma (b), (a+b) and no other additions. The results showed that the aerobic breakdown of Eichhornea and the other 3 substrata took 3 and 4 weeks, respectively, before the incubation of earth worms was adequate. Cow dung or Trichoderma supplements, either separately or in combination, helped shorten the earthworm incubation period by one week compared to when no supplements were added.

Key Words : Biodegradation, obnoxious, vegetation,

Introduction

In our ecosystems, there are many unpleasant plants that thrive even in unfavorable agro-ecological settings. Parthenium (Parthenium hysteropherus L.), water hyacinth (Eichhornea crassipes L.), ipomea (Ipomea cornea L.), and lantame (Lantana camera L.) are four such nuiscence plants that are growing alarmingly and spreading quickly over our surroundings. These plants are dangerous to our way of life, and controlling them is incredibly expensive, labor-intensive, and time-consuming. In the world of agriculture, there is a great deal of concern regarding the conversion of the enormously available biomass of these poisonous plants into beneficial organic manures by composting. Nevertheless, our conventional techniques of composting are time-consuming and unclean. It is commonly known that various macro and microorganisms help composting to proceed more quickly (Bhawalkar, 1991). Earthworms, Trichoderma, and the excrement of live animals are all helpful in this regard. Vermicomposting is the term for the artificial process of turning any bio-wastes into manure. However because of the elevated temperature and acidic pH levels of the substrate, earthworm incubation during the initial stages of decomposition is harmful to their survival. When they are frequently incubated in partial aerobic breakdown of substrate, earthworms thrive. In order to determine the ideal time for earthworm inoculation for vermicomposting of various noxious vegetations, the present study was created.

Methods And Materials

From January to April 2023, pot culture experiments were carried out on a dairy farm in Tarasevaniya, Bhopal (MP). Equivalent amounts (4 kg on a dry weight basis) of fresh biomass from four different plants—Parthenium, Water Hyacinth, Lantana, and Ipomea—were each subjected to partial aerobic decomposition for five weeks while being supplemented with four different additives (a). Before earthworm incubation, add 50 g (b), a+b, and no additives. There were four copies of these study. From the day the study began to the end of the fifth week, observations were made on a regular basis every seven days about potential changes in pH and temperature during partial decomposition. To calculate the dry matter content of all four types of plants, one

kilogram of their fresh biomass was baked at 60 °C until it reached a consistent weight.

Result And Discussion

Lantana has the highest dry matter content (26.8%), followed by Ipomea (24.4%), Parthenium (21.7%), and Water-hyacinth (20.1%). Based on these fresh biomass values, Table 1 shows that the entire vegetation is equivalent to 4 kg of the dry weight of the relevant substrata was given permission to decompose. With pH ranges between 7.58 in lantana and 8.06 in Parthenium, almost all substrata were of an alkaline character. Throughout the partial breakdown of all 4 substrata, the pH indicated a falling trend at every stage. For Eichhornea, Ipomoea, Lantana, and Parthenium, respectively, partial decomposition took 14, 21, and 28 days until the pH was neutral (less than 7.5). The temperature of the substrate climbed quickly as the aerobic decomposition period progressed up to 14 days, after which it tended to fall until it returned to normal (approximately 28°C) at 21 and 28 days. Likewise, the other three substrates. Hence, after 3 and 4 weeks of aerobic breakdown of Eichhornea and the other 3 substrata, respectively, the incubation of earthworms was adequate. Cow dung or Trichoderma supplements, either separately or in combination, helped shorten the earthworm incubation period by one week compared to when no supplements were added. These findings closely match those of several other researchers (Singh and Sharma, 2002; and Sharma et al., 2004).

Table 1

Partial Aerobic Decompoition Of Vegetations

VEGETATION	DRY MATTER (%)	FRESH QUANTITY(KG)
Parthenium	21.7	18.4
Ipomoea	24.4	16.4
Lantana	26.8	14.9
Water hyacinth	20.1	19.9

Reference

1) Bhawalkar, U.S. (1991). Vermiculture technology for LEISA. Seminar and low External input Sustainable Agriculture. Amesterdam, Netherland.
2) Sharma, V., Karwar, K. and Dev, S.P. (2004). Efficient recycling of obnoxious weed plants lantana and congress grass as organic manures through vermicomposting. Journal of the Indian Society of Soil Science, 52(1): 112-114.
3) Singh, A. and Sharma, S. (2002). Composting of a crop residue through treatment with micro-organisms and subsequent vermicomposting. Biosource Technology, 10(4): 987-990.Gangadhar, N.S.and Anandanigowda (1995). Vermicomposting of weeds (i) Role of earthworms in soil fertility and vermicomposting technology. Bangalore, Bulletin 1956 pp 61-72 University of Agricultural Sciences, Bangalore, Bulletin 1956 pp 61-72.