

**FINAL REPORT OF THE WORK DONE ON THE MAJOR RESEARCH PROJECT**

**(From 01-04-2013 to 31-03-2017)**

**Reference No. & Date. F. 42-963/2013 (SR) Dated: 14-03-2013**

**“STUDIES ON THE UTILIZATION OF PRESSMUD THROUGH VERMICOMPOSTING”**

**Submitted to**



ज्ञान - विज्ञानं विमुक्तये

**UNIVERSITY GRANTS COMMISSION  
BHADURSHAH ZAFAR MARG  
NEW DELHI- 110 002**

**Submitted by**

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Assistant Professor  
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UGC-Major Research Project**

**DEPARTMENT OF BOTANY  
[UGC-SAP & DST-FIST SPONSORED DEPARTMENT]**



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**UNIVERSITY GRANTS COMMISSION  
BAHADUR SHAH ZAFAR MARG  
NEW DELHI – 110 002**

**PERFORMA FOR FINAL REPORT OF THE WORK DONE ON THE PROJECT**

**1. TITLE OF THE PROJECT:** STUDIES ON THE UTILIZATION OF PRESSMUD THROUGH VERMICOMPOSTING

**2. NAME AND ADDRESS OF THE PRINCIPAL INVESTIGATOR:**

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**3. NAME AND ADDRESS OF THE INSTITUTION:**

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**4. UGC APPROVAL LETTER NO. AND DATE:**

F.No. 42-963/2013 (SR) Dated: 14.03.2013

**UGC EXTENSION LETTER NO. AND DATE:**

F.No. 42-963/2013 (SR) Dated: 22.06.2016

**5. DATE OF IMPLEMENTATION:** 14.03.2013

**6. TENURE OF THE PROJECT:** 01.04.2013 to 31.03.2017

**7. TOTAL GRANT ALLOTTED** : Rs. 8,51,074.00/-

**8. TOTAL GRANT RECEIVED**

**1st Instalment** : Rs.4,75,800.00/-

**2nd Instalment** : Rs.2,97,847.00/-

**9. FINAL EXPENDITURE** : Rs. 7,72,938.00/-

**10. TITLE OF THE PROJECT** : STUDIES ON THE UTILIZATION OF PRESSMUD THROUGH VERMICOMPOSTING

**11. OBJECTIVES OF THE PROJECTS**

The present study is to rehabilitate the sugar industry waste pollutant by using *Vigna mungo* plants under vermiremediation process for reduce, reuse and recycle waste the different concentration of

pressmud in the cattle dung to combined with the help of *Eisenia foetida* earthworm within a reasonable time frame of vermicomposting. The objective of the present investigation are as follows.

- To achieve the goal of value-added biofertilizer with maximum nutrient recovery and worm mortality.
- To explore the potentials of vermicomposting to manage press mud generated from sugar industry in a sustainable fashion.
- To satisfy the farmers, by producing nutrient rich vermifertilizer for raising plants better than normal fertilizer.

## **AIM**

The aim of the present study was to recycle the sugar industry waste, pollution control by using earthworm under vermicomposting process for reducing the concentration of press mud in the vermicomposting level within a reasonable time frame of short duration.

## **OBJECTIVES**

- ❖ To collect the *Vigna mungo* L. plant seeds
- ❖ To collect the press mud from EID parry sugar mill
- ❖ To analysis the physio-chemical of press mud and cattle dung
- ❖ To prepared the vermicompost in different ratio of press mud and cow dung
- ❖ To analysis the initial and final physio-chemical in different concentration of feed mixture and vermicomposting
- ❖ To grow he *Vigna mungo* L. plants at different ratio in pot and plot study on botanical garden
- ❖ To analyse the different treatment of (Control, T<sub>1</sub>, T<sub>2</sub>, T<sub>3</sub>, T<sub>4</sub>, T<sub>5</sub>, T<sub>6</sub>, T<sub>7</sub>, T<sub>8</sub>, T<sub>9</sub>) vermicompost role and relation to morphological and biochemical variation of the *V. mungo* L. on press mud vermicompost of botanical gardent.
- ❖ To investigate the statistical analyse of morphology and biochemical parameters of different ratio vermicompost and earthworm growth and reproduction in different days and treatment of recommended amount of press mud treatments.
- ❖ To find out different ratio of press mud and cow dung effects of *V. mungo* L. on germination, growth, morphological and yield parameters of field condition

- ❖ To apply the collected data from the statistical tool (SPSS 21) methods and interpretation of experimental results.

## **12. WHETHER OBJECTIVES WERE ACHIEVED (GIVE DETAILS)**

The major objective of the project is to get to know the influence of pressmud in vermicomposting. The project also help to know the level of recycling the sugar industry waste within a reasonable time in pot and plot study. Also, the germination, growth, morphological and yield parameters of *Vigna mungo* in using pressmud based vermicomposts were carried out successfully.

## **13. ACHIEVEMENTS FROM THE PROJECT**

The results of the present project proved that bio-stabilization of sugar industry solid waste with cow dung using earthworm could be a potential technology. These plans play an integral role in the comprehensive waste management planning process and are used to spell out how farmers intend to maximize the benefit of nutrient available from sugar industry waste products to benefit crop production and minimize environment impact.

## **14. SUMMARY OF THE FINDINGS**

The present study shows that vermicomposting can be used as a potential tool to bio-convert sugar industry pressmud into vermicompost. Among all the treatments, treatment no.3, CD 70% + 30% PM (T3) Showed better quality vermicompost with higher nutritional status when compared to the other treatments. The morphological parameters and biological parameters(Germination, root and shoot length, Number of leaves, total leaf area, fresh and dry weight chlorophyll a, b , carotenoid, etc., of the plant leaves) of the black gram *Vigna mungo* in all the treatment. In all the treatments showed a decreasing, pH, Ec, TOC, C:N ratio and increasing TN, TP, and TK. Finally, the present study concluded that biostabilization of sugar industry soild waste with cow dung using earthworm could be a potential technology.

## **15. CONTRIBUTION TO THE SOCIETY**

Most waste management approaches are methods of concentration of waste, such as source separation, biological waste treatment, incineration, or land disposal. Recycling, reprocessing, and utilization of the wastes in a positive manner offers the possibility of returning the excess to beneficial use as opposed to the traditional methods of waste disposal and relocation. The keys to successful process of this nature are a beneficial use, an adequate market, and an economical, although not necessarily profit-making process. Many such processes would be satisfactory if they caused the overall costs of waste management to be less than other alternatives. The utilization of waste materials from agricultural production operations can assist in reducing some waste management problems. In some areas drastic measures, such as burning, are used to dispose of troublesome residues and to control plant

disease and weeds. Burning as a disposal method is being reduced and more of the material is being utilized by returning it to the soil as a mulch which is later plowed under. Efforts are needed to develop methods to utilize additional excesses from agricultural production. All activities in this direction must be directed toward effective and economically feasible solutions and towards development of adequate markets for the usable by-products. The fundamentals of the processes and their real or potential application with sugar industry wastes are indicated. The processes are composting, drying and dehydration, by-product development, and water reclamation. When the waste is broken down by bacteria (and fungi) ammonium is created, which is then converted into nitrates by other bacteria. Plants absorb ammonium and nitrate ions through their roots, ensuring their survival and growth. Interestingly, all of the nitrogen present in animal wastes comes from plants the animal has eaten. The proper management of waste from agriculture operations can contribute in a significant way to farm operations. Waste management helps to maintain a healthy environment for farm animals and can reduce the need for commercial fertilizer while providing other nutrients needed for crop production. Best management practices (BMPs) such as rotational grazing and pasture renovation to maintain adequate vegetative cover, riparian buffers, and structures built to trap or retain waste should be utilized in order to prevent contamination of both surface waters and groundwater. If not managed properly, sugar industry waste from farm operations can pollute the environment resulting in impacts to water quality and a general loss of aesthetics. The degradation of water quality can impact adjacent waterways and groundwater both onsite and offsite. This degradation reduces the ability of this resource to support aquatic life and water for human and animal consumption. However, the primary reasons behind managing sugar industry waste make good sense both environmentally and economically. Where feasible, the reuse of animal waste in farming operations can reduce the quality and hauling costs of commercial fertilizer. Waste management is commonly part of an overall nutrient management plan developed for a farmer. These plans play an integral role in the comprehensive waste management planning process and are used to spell out how farmers intend to maximize the benefit of nutrient available from sugar industry waste products to benefit crop production and minimize environmental impact. If waste is not handled properly or is not applied at the right time, valuable nutrients are lost and environmental and human and animal health problems are created. Keeping up-to-date on technologies designed to improve waste management such as composters for disposing of livestock mortalities and integrating them in your waste management strategy is also good practice. Complete legal framework for managing sugar industry wastes, approach 3R should be considered as a priority orientation. Research and Development of biogas/compost fertilizer production is encouraged for reducing

environmental pollution and effective exploitation of clean energy. Improve knowledge and awareness of community. Enhance financial for manage mental activities and science research.

#### **16. WHETHER ANY Ph.D. ENROLLED/PRODUCED OUT OF THE PROJECT**

**Yes. Ph. D Enrolled**

**Roll No : 1419030001**

**Candidate Name : Mr. M. BOOPATHIAYANAR, project fellow on 31.03.2017**

#### **17. NO. OF PUBLICATIONS OUT OF THE PROJECT**

**(1) Muthukrishnan Boopathiyyanar, Swaminathan Prabakaran** "Impact of pressmud on the growth and reproduction of the *Eisenia foetida* (savigny)" Internation Journal for Science and Advance Research in Technology, 3(4)

**(2) Muthukrishnan Boopathiyyanar, Swaminathan Prabakaran .** "Production of vermifertilizer from sugar industry wastes by using vermicompost epigenic Earthworm" Interntional journal of Plant Sciences" vol. 12 no. 2, july 2017 .

**(3) Muthukrishnan Boopathiyyanar, Swaminathan Prabakaran.** "Sugar Industry waste recycling through vermicompost by *Eisenia foetida* (Savigny)", IJSRST, 3(8): 1191-1198.

**(4) Muthukrishnan Boopathiyyanar, Swaminathan Prabakaran.** "Solid waste Management of Sugar Industry Waste through vermicomposting and its Impact on Growth of Black gram" Annals of Plant Science (Under communication)