iJRASET
International Journal For Research in Applied Science and Engineering Technology

# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

**Volume:** 10 **Issue:** IV **Month of publication:** April 2022

**DOI:** https://doi.org/10.22214/ijraset.2022.41726

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
*ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538*
*Volume 10 Issue IV Apr 2022- Available at www.ijraset.com*

# A Study of Garbage Enzyme Solution

Shailesh B Jabhade[1], Ajinkya C Bhosale[2], Prasad B Maske[3], Shashikant B Pavane[4], Swati Mane[5]
[1, 2, 3, 4]*U.G Student Civil Department, JSPM's Imperial College Of Engineering & Research, Pune, India.*
[5]*Professor Civil Department, JSPM's Imperial College Of Engineering & Research, Pune, India.*

***Abstract:*** ***Garbage enzyme is obtained by fermenting fruit and vegetable wastes. This alternative method of biological recovery of organic waste may provide a solution to waste minimization and reduction since a large proportion of municipal solid waste consists of food waste. A study was conducted to assess the implementation of garbage enzyme making and usage as an initiative to reduce the amount of municipal solid waste generated by a hawker community. It was found that practical values, communal spirit and awareness of environmental consequences were among the factors that encourage the practice of garbage enzyme making, while ignorance, time and convenience factors hinder garbage enzyme making and usage. Taking these factors into consideration, municipalities could promote garbage enzyme as a viable method in reducing the amount of MSW generated.***
***Keywords: garbage enzyme, anti-microbial.***

## I. INTRODUCTION

Due to the increase in the worldwide population, the problem of urban waste disposal and industrial waste management has become increasingly critical, so as the garbage enzyme can be the universal solution for it. Garbage enzyme solution was developed by Dr. Rosukon from Thailand. She has been actively involved in enzyme research for more than 30 years and encourages people to make garbage enzyme at home to ease global warming.

## II. AIM & OBJECTIVES

The main aim of this research is to explore the possibility to implement garbage enzyme system on the organic waste in order to manage the landfills and achieve go green vision for waste disposal in order to provide a quality environment from pollution since green state and tourism spot.

Objectives are as follows

1) To prepare the stain remover solution at domestic level.
2) To prepare enzyme solution by using different fruit and vegetable waste.
3) To check suitability of enzyme solution containing fruit and vegetable waste on different surfaces.
4) To check economy of enzyme solution containing fruit and vegetable waste as compare to enzyme solution without fruit and vegetables

## III. METHODOLOGY

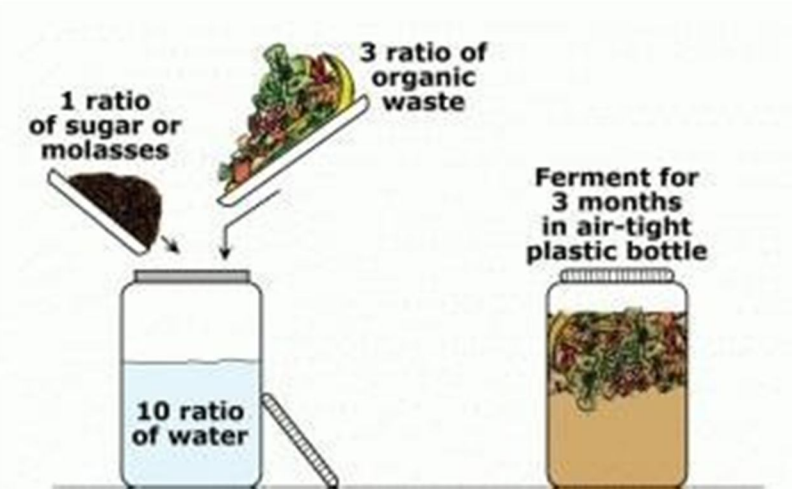



Fig No.1.Garbage Enzyme Production

Table No.1 Proportion of Water, Jaggary, Garbage

| Ratio of Making Garbage Enzyme | Kg | Kg | Kg | Kg |
|---|---|---|---|---|
| brown sugar, molasses sugar or jaggery | 1 | 1 Kg | 300g | 10 Kg |
| fruits and vegetable | 3 | 3 Kg | 900g | 30 kg |
| Water | 10 | 10 Kg | 3 Kg | 100 Liter |

A large batch of garbage enzyme had been produced for this study, from the methodology and recipes published in the media, using clean water without chlorine content. To produce about 10L of garbage enzyme, 3kg of vegetable and fruit biomass was fermented together with 1kg brown sugar and 10L water for three months. The fermentation yielded a brownish liquid, which was separated from the solids. To study the effects of the garbage enzyme on wastewater, varying mixtures of garbage enzyme with wastewater is allowed to digest for a period of 5 days, to allow the enzyme to affect the wastewater. Water quality tests are carried out during and after the digestion period to determine its effects. The test is divided into three phases. To further study the effects of degradation of the wastewater constituents, monitoring of the water quality parameters is carried out daily, over the 5-day digestion period (phases 2 and 3).

Mixtures of the wastewater sample are tested for six water quality parameters, namely pH, ammonia nitrogen (NH3-N), phosphorus (P), and chlorine, nitrate (NO3-N). All of these testing parameters were carried out with the Hatch self – contained Surface Water Test Kit. The 5-day Biochemical Oxygen Demand (BOD5) test is conducted according to Standard Method for the Examination of Water and Wastewater 5210: Biochemical Oxygen Demand, published by American Public Health Association (APHA), American Water Works Association, Water Environment Federation (1999). Due to space constraints, the standard methodologies for these tests are not presented here.

## IV. LITERATURE REVIEW

### A. *Fu E. Tang and Chung W. Tong*

DUE to the increase of the worldwide population, the problem of sewage disposal and industrial waste management has become increasingly critical. Nearly 70-80% of rivers and streams carry polluted water. Therefore, to preserve water quality for future generations, an effective means of solving this problem must be developed. Wastewater treatment technology has been improving, and currently it is possible to treat wastewater to a highly usable level efficiently and cheaply. Although treatment of wastewater and its legislation is well instituted in urban and rural areas in developed countries; proper sanitation, with efficient treatment, has not been practiced in many other places, especially in suburban areas in developing countries like Malaysia. For domestic wastewater treatment, the removal of biological organic pollutants and nutrients is the main priority. Municipal wastewater typically consists of domestic wastewater (50 - 90%) originating from residential sources, commercial wastewater (5 - 30%) and industrial wastewater (5 - 20%). Thus, wastewater should be treated properly before being discharged to receiving water bodies.

### B. *Fauna Nazim and V. Meera*

The problem of sewage disposal and industrial waste management has become increasingly critical due to the increase of worldwide population. Catastrophic impacts on human health and on the environment could result if pollution of receiving waters is allowed to continue. Therefore, to preserve water quality for future generations, an effective means of solving this problem must be developed. Wastewater treatment technology has been improving, and currently it is possible to treat wastewater to a highly usable level efficiently and cheaply. Greywater is the used water resulting from washing

Clothes and kitchen utensils, shower or bath and other domestic water not containing excreta. Greywater is also one of the major point pollution sources, which is discharged from residential and commercial areas into the rivers without any treatment. It is the wastewater from kitchen sinks and hand basins in household or cafeteria premises. The quantity of greywater varies with the quantity of water supplied and certain local practices, such as whether personal and clothes washing is done at the home or at the water source. There are many ways to treat greywater so that it can be reused. The treatment and reuse of wastewater is rapidly becoming a subject of great interest to researchers.

The Fazna Nazim, P.G.Student, Civil-Environmental Engineering, Government Engineering College, Thrissur, Kerala, India, E-mail:faznanazim@gmail.com D.E.A. Assistant Professor, Civil Engineering Department, Government Engineering College, Thrissur, Kerala, India, and E-mail: meerav17@hotmaill.com various methods must be safe from a health point of view and not harmful to the environment. Decentralized wastewater management offers most opportunities for maximizing recycling opportunities.

## V. SCOPE OF PROJECT

The production of garbage enzyme releases O3 molecules, which is what the ozone layer is made of. Therefore, by making garbage enzyme, we are saving earth's ozone layer by saving the ozone layer, we can reduce the many harmful effects of the suns ultra-violet rays, such as the occurrence of skin cancer. because many waste products, such as peels of fruits and old vegetables can be used to make the enzyme. Garbage enzyme can be used as a cleaning agent. It can be used to wash dishes, clean toilets, as well as to wash hair. Therefore, a lot of money can be saved from buying washing liquid and shampoo. Natural household cleaner, air purifier, detergent, car wash, organic fertilizer etc. Methane gas released from garbage can trap 21 times more heat than co2 worsen than global warming condition.

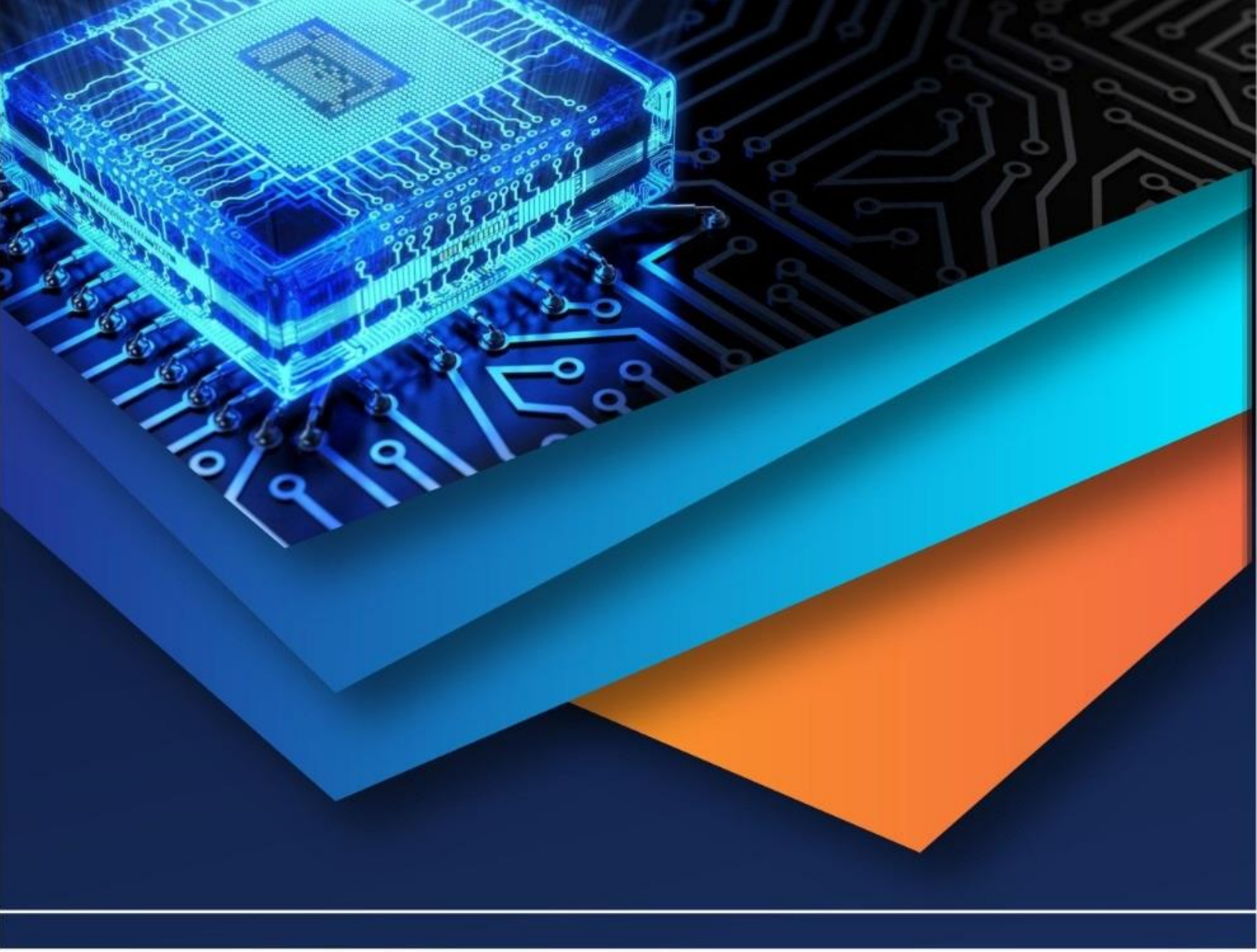
## VI. RESULT & CONLUSION

*1)* By usage of garbage enzyme instead of chemical agents mixing with water we can save money.
*2)* Reduce the clutter in your kitchen cabinet.
*3)* Save waste by reducing and recycling the waste.
*4)* Garbage Enzyme creates a gas that lowers the green house effect.

Several kinds of fruits and vegetable wastes can be used to perform enzyme and antimicrobial activities. These produced enzymes from garbage shows the antimicrobial activity with Gram-positive and Gram-negative bacteria so the garbage enzyme can be utilised to kill/inhibit the pathogens in house. By using garbage enzyme solution we can turn trash into treasure as it has many advantages, likes it helps to reduce the number of landfills, garbage enzyme creates a gas that increase oxygen level in the air. It can be used as multi-cleaning purpose and also it provides a tremendous effect in plant growth. If every household recycles their garbage into garbage enzymes it will be helpful for the environment.

## REFERENCES

[1] Husain, M., and Husain, Q. “Applications of Redox Mediators in the Treatment of Organic Pollutants by Using Oxidoreductive Enzymes: A Review”. Critical Reviews in Environmental Science and Technology; vol. 38, No. 1.
[2] 2008
[3] Tan, A. H. 2006. A study into a viable wastewater treatment system for a commercial site in Sarawak. BEng, Curtin University Sarawak Campus
[4] Lu, J., Huang, Q., and Mao, L. “Removal of Acetaminophen Using Enzyme-Mediated Oxidative Coupling Processes: I. Reaction Rates and Pathways”. Environ. Sci. Technol. 2009, vol. 43, pp.7062-7067. 2009.
[5] AI-Jasser, A.O. “Enhancement of Sludge setting with Chemical Additives”. Water Environment Research, Sep/Oct 2009; Vol. 81, No.9. 2009.
[6] Anonymous. 2002. at work on additives: Bio-additive aids nitrification, treatment plant study... Water Engineering & Management; Oct 2002; vol. 149, no. 10; ABI/INFORM Global pg. 41.
[7] Lee, S., Hong, S., Sung, M. “Removal and bioconversion of phenol in wastewater by a thermos table β-tyrosinase”. Enzyme and MicrobialTechnology, Vol., 19, pp 374 – 377, 1996
[8] Cammarota, M.C., and Freire, D.M.G. “A review on hydrolytic enzymes in the treatment of wastewater with high oil and greasecontent”. Bioresource Technology, Vol. 97, pp 2195 – 2210, 2006
[9] Masse, L., Kennedy, K.J., and Chou, S.P. “The effect of an enzymatic pretreatment on the hydrolysis and size reduction of fat particles in slaughterhouse wastewater”. Journal of Chemical Technology and Biotechnology, Vol. 76, pp 629 – 635, 2001
[10] Mendes, A.A., Ernandes, and B.P., Heizer, F. De Castro. “Effect of the enzymatic hydrolysis pretreatment of lipidsrich wastewater on the anaerobic bio digestion”.
[11] Biochemical Engineering Journal, Vol. 32, pp185 – 190, 2006
[12] Duran, N., and Esposito, E. “Potential applications of oxidative enzymes and phenol oxidase-like compounds in wastewater and soil treatment: A review”. Applied Catalysis B: Environmental, Vol. 28, pp 83 – 99, 2000.



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

# INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY