



# Analysis of Enzyme from Vegetable Waste

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**Abstract:** Enzyme are some organic compounds including enzymes produced by the simple fermentation of fresh vegetable wastes, fruit wastes with addition of jiggery and water by using the selective microorganisms like Yeast and Bacteria. This fermentation creates natural chains of proteins, mineral salts, organic acids, and enzymes which has the capacity to breakdown, change, create and catalyse - functions that make it a wonderful cleaning aid in household as well as in industrial and medical applications. The study for the production and analysis of enzyme by using yeast and bacterial cultures in different fruit and vegetable wastes. These wastes are taken for fermentation. During fermentation, the enzyme production like cellulase, amylase and protease were tested for its activity in fermented broth at different period of fermentation and found with moderate level of activity. The pH values and the microbial population including bacteria and yeast and mold also were also analyzed in the fermented broth at different intervals period.

**Keywords:** Enzymes; fermentation, microorganism, analysis.

## I. INTRODUCTION

The waste from fruit and vegetable market in actual sense is not a waste as everything can be profitably recycled, transformed and utilized in one or the other form as biofuels. But the majority of the technologies for the waste utilization are developed at the laboratory scale. So, these technologies are required to be standardized for commercial operation by the industry. Therefore, proper waste usage can avoid environmental pollution and add wealth to the nation. Fruits and vegetables are more prone to spoil than cereals due to their nature and composition. Fermentation is a method of generating enzymes for industrial purposes. Fermentation involves the use of microorganisms, like bacteria and yeast to produce the enzymes. Enzymes are formed during growth of microorganisms as a result of oxidative metabolism and aerobic fermentative.

### A. Objectives

1. To study the performance of the Enzymes, organic acids during fermentation
2. The main aim of the present study is Production of Enzyme by green method.
3. Environmental hazardous to minimize the environmental pollution by the usage of waste raw materials like vegetables and kitchen waste optimize the production of Enzyme provided with simple and natural media.
4. Analysis of Physio-chemical parameters fermentation in different incubation period like pH, alkalinity, color of the solution and viscosity of the solution.

## II. LITERATURE REVIEW

Deusanilde J. Silva et al., (2011) Deusanilde J. Silva and his coworkers explained an enzymatic treatment is proposed as a preparative, cleaning protocol to remove cellulose films from resonators and sensors

Quartz crystal and surface Plasmon gold sensors, coated with ultrathin films of cellulose are used in studies of molecular (for example, polymer and surfactant) adsorption. The sensors are usually recycled after removal of the film, with limited success, after one of two treatments, either hot acid or ammoniac solutions. In the proposed, improved protocol a mixture of cellulases from *Aspergillus* species, are used as a pre-treatment to facilitate the release of the Cellulose film from the surfaces of the sensors. It is concluded that the use of the recycled ammoniac cleaning solution after the enzymatic treatment is a very convenient, safe and less

Kanagaraj et al., (2009) Leather industry is facing tremendous pressure from the various pollution control bodies because of the huge amount of pollution associated with processing explained by Kanagaraj. Advancements in processing techniques and adoption of cleaner technologies have enabled the tanners to get rid of pollution from the leather processing. Though there are various cleaner technologies based on chemical methods are available but cleaner technologies based on enzymatic methods are viable, eco-friendly and form alternative to the existing technologies. Enzymes in leather industry became a part and parcel of the system to mitigate pollution problem in the leather processing operation. The enzymes find application in soaking, unhairing, degreasing and bating of leather processing operations for obtaining better leather qualities. Applications of enzymes in various stages of leather processing are discussed in this paper.



Toca-Herrera et al., (2007) Toca- Herrera explained Solid-state fermentation (SSF) processes involve the growth of microorganisms (typically fungi) on a solid material in the absence or near absence of free-flowing water. Utilisation of agro-industrial residues as support-substrates in SSF processes provides an alternative avenue and value- addition to these otherwise under- or non-utilised residues. SSF processes have shown to be particularly suitable for the production of enzymes by filamentous fungi, since they reproduce the natural living conditions of such fungi. In the present chapter the production of laccase enzyme by white-rot fungi under SSF is described.

### III PROPOSED METHODOLOGY AND COLLECTION

1. Collection of vegetable waste from market
2. Avoiding or segregated onion, garlic, Ginger, potato waste
3. Take 3 liter glass or plastic air tight bottle
4. Add 1 kg of vegetable waste, 3 liter of water, and 333 gm of jaggery
5. keep it in air tight bottle for 3 months
6. Open lid of bottle for one month everyday
7. After 3 months filter and separate enzyme and waste remaining.
8. Various parameters like cellulose, pH, BOD, EC, DO will be tested in laboratory
9. The data is analyzed for further use of this enzymes.

### IV EXPECTED OUTCOMES

Enzyme Bio-cleaners are an organic solution produced by the simple fermentation of fresh vegetable wastes with addition of jaggery and water by using the selective microorganisms like Yeast and Bacteria.

This fermentation creates natural chains of proteins, mineral salts, organic acids and enzymes. This has been developed for people to make simple cleaning solution at home or in small scale business to ease global warming because minimizing the environmental pollution by utilizing the cabbages like kitchen waste, vegetable and fruit wastes from stalls and markets. This product is natural, safe, and good for the environment and use the magic of nature to produce extraordinary removal of dirt, oil, stain etc. resulted to customer satisfaction. The advantage of using enzyme bio-cleaning solution are It is safer for the environment and safer for human health than traditional chemical cleaners and odor control products. Based on the above scientific and technical information, the present work is proposed to carry out the production and analysis of the fermentation parameters of Enzyme Bio- cleaning solution by using the residues and waste of agricultural produces like fruit and kitchen waste including vegetable wastes with help of Yeast and Bacteria with addition of cheaper carbohydrate sources like brown sugar and water medium.

#### Zero-waste Economy:

In view of the inevitable applications of enzymes and organic acids in different industries and human life, there is always a concern about the economic production methodology and cheaper raw materials. Vegetable wastes possess the potential to be processed through the use of selected microorganisms into a wide range of value added products. Greenhouse gas emission and waste disposal problems further encourages the bioprocessing of wastes to achieve zero-waste economy. Advances in microbial biotechnology in the last few decades have built an avenue towards the successful application of these wastes into high ended products like enzymes and organic acids

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