

# Morphological and physiological effect of Bio-enzyme Activity on *Manilkara zapota* plant

Sunil Kumar Bourasi<sup>1</sup>, Narendra Khore<sup>2</sup>, Anand Verma<sup>3</sup>

<sup>1</sup>Department of Botany, BSB Govt. College Timarni Dist. Harda, (India)

<sup>2</sup> Department of Chemistry, Harda Degree College, Dist. Harda, (India)

<sup>3</sup> Department of Microbiology, Harda Degree College, Harda Dist. Harda, (India)

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**Abstract:** Bio-enzyme is a fermented sap of fruits. Locally available fruits was collected from the market and removing the upper layer seeds of their and using pulp of the fruit for the further fermentation. Using pulp of fruits and adding water in the container and adding Jaggery and stay for three month. Than after 3 month fermentation enzyme sap would be prepare for the plants use. One liter bio-enzyme should be dissolve in 15 liter water and its pore in the plant root of *Manilkara zapota* with the verbal of 3 to 5 days of two year old plant and observed the after one month. After one month treated plants were reported to have denser chlorophyll as compared to control, bio-enzyme contains gibberellic acid, a plant growth regulator that has been shown to help increase stem elongation and, thus, internode length. Bio-enzyme, increase in fruit numbers. The fruit weight sapota was observed to increase.

**Keywords:** Bio-enzyme, Pulp, Fermentation, Chlorophyll, Gibberellic acid.

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## 1. INTRODUCTION

Awareness of human health has increased in recent decades. The world's population is growing rapidly, and millions of people are joining the workforce every year. Countries has big problem for the feed to every person, and second issue is the providing quality food of these. Chemical fertilizers increase crop yields, but they have many harmful effects on human health and soil. Chemical fertilizers can also lead to soil degradation. The organic farming is the beyond farming technique which solve the problem of that. Organic farming offers various techniques beyond farming such as Amrit Jal, Amrit Mitti, bio-enzyme production etc. Bio-enzymes are found in fruits which are capable of decomposing heavy organic matter of the soil<sup>1</sup>. It converts heavy carbon chains into simple carbon chains. Harvesting fruits contain growth regulators such as auxins, gibberellins etc<sup>2</sup>. These hormones stimulate the growth and yield of the entire plant. Bio enzymes are entirely organic and assist in waste reduction because their main ingredients are fruit and vegetable peels, which are considered trash and discarded<sup>3,4</sup>. Worked done on different type of vegetable crop they found growth and high yield with bio-enzyme. it increase the carbohydrates, and protein contain due to the photosynthetic activities in the crop<sup>5</sup>. Bio-enzyme is a mixer of the many enzymes and protein, carbohydrates also it can complete the metabolic activates of plants<sup>1</sup>.

Bio-enzymes are enzymes generated naturally from plants. These enzymes are used in various firms, as the processing of food, treatment of wastewater, and biological remediation. It has very useful enzyme<sup>6</sup>. Present research work is present and mode of action of that.

## 2. MATERIAL METHODS

Ripe fruits were used to make the bio-enzyme. Fruits that were overripe or already fermented were collected from fruit markets. For faster fermentation, the fruits were cut into small pieces, including the peel. Combine 15 kg of chopped fruit, 50 liters of water, and 5 kg of jaggery. Mix thoroughly in a plastic container and let it ferment for three months. Metabolic gases will escape from the container. After three month chopped fruits were formatted in the container, than it filter with

cotton filter. We will use filtrate as liquid fertilizer in the *Manilkara zapota* plant. Filtered, and the bio-enzyme solution, after being filtered, was carefully stored in its dedicated bottle. One liter bio-enzyme should be dissolve in 15 liter water and its pore in the plant root of *Manilkara zapota* with the verbal of 3 to 5 days of two year old plant and observed the after one month.

### 3. RESULT AND DISCUSSION

After one month observed result in following table

ORGAN CHARACTERISTIC	TREATED PLANT	NORMAL (CONTROL)
LEAF LENGTH	6-7 cm	4-5 cm
LEAVES	Dense 12-14/10cm	Normal 8-9/10 cm
STEM THICKNESS	2-3	1-2
STEM ROUGHNESS	Smooth	Rough
LEAVES CHLOROPLAST	Dark green	Light green
ROOT GROWING	10-12 cm	
FLOWERING	Whole plant 3-5/ bunch	Half plant 1-2/ bunch
FLOWER DROPPING	10-15%	40-60%
FRUIT SIZE	120-170 gm	70-100 gm
FUNGAL ACTIVITIES	No	no

Density of chlorophyll differences were recorded between the chlorophyll content of leaves of Bio-enzyme treated plants and the control. Treated plants were reported to have denser chlorophyll as compared to control. Bio-enzyme contains auxin<sup>7</sup> which increases the chlorophyll content of leaves.

The number of branches on treated plants increased as Bio-enzyme concentrations increased. The average internode and branches length per plant showed significant differences for most treatments, although Bio-enzyme treated plants had longer internodes that increased with increasing concentrations. Bio-enzyme contains gibberellic acid, a plant growth regulator that has been shown to help increase stem elongation and, thus, internode length.

Treatment induced significant differences in fruit set. The highest percentage fruit set (30.40%) in sapodila, representing a auxin, one of the components of Bio-enzyme is a candidate for such signal molecules Bio-enzyme contains cytokines which might have also stimulated cell division, increased sink activity to improve the ability of developing fruits to compete for resources. Significant difference was observed in the quantity of fruits after treating the plants with Bio-enzyme. The highest number of fruits per day was recorded in plants treated with Bio-enzyme, increase in fruit numbers may be attributed to the synergistic effect of the plant growth regulators present in the foliar fertilizer. The fruit weight sapota was observed to increase from 120 grams to 170 grams. This study can be attributed to the synergistic effect of gibberellin, IAA and ted<sup>9</sup>

### 4. CONCLUSION

The present work present the activity of bio-enzyme. Bio-enzyme contain growth regulators, it's capable to enhance the whole development and productivity of plants. It's slightly increase the chlorophyll and photosynthesis. Farmer should utilize the bio-enzyme for high production of crop. The study results show there is a significant increase in the chlorophyll content on treated with bio-enzymes.

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