



# AN UNCONVENTIONAL FARMING BY LACTOBACILLUS SERUM

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## ABSTRACT

Chemical Fertilizers are mixed with the soil to enhance the growth of a plant, plant grows rapidly but essential flora may be destroyed and quality may alter thereby affecting its consumers. To overcome this effect, effort in the current investigation was to produce Lactobacillus Serum with an easy method that can be used for household purposes daily. It shows best utilization of the Waste Rice wash, Pulses wash and raw milk which is wasted in Gallons if not circulated. Lactobacillus Serum extracted from middle layer was used as biofertilizer and for preparation of Compost. By its use very promising results were obtained as plant growth rapidly increased by 15.6 cm on the sixth day itself while for the control it was just 11 cm. Antimicrobial activity for few tested pathogens did not give prominent results as only 8 mm zone of inhibition was observed. In an aquaculture, Growth of Normal flora was not affected at all and the quality of water was improved as Lactobacillus serum digests all the waste excreted by the fishes.

**Keywords:** Chemical fertilizers, Lactobacillus Serum, Bio-fertilizer, Antimicrobial, and Aquaculture.

## INTRODUCTION

Probiotics are beneficial organisms like bacteria and yeast that are believed to improve health when consumed. Both plant and animals need these beneficial microbes to stay healthy. In fact, without the teeming good bacteria in the intestine of man and animals, digestion will not occur. The digestive system of man contains about 500 different types of bacteria. Apart from the benefits to plant and animals, probiotics help to reduce foul odor in animal houses, homes etc. It can also help to free clogged drains. The good bacteria in probiotics eat up bad bacteria that cause smell and diseases Hill [1].

Lactobacillus bacteria are in many probiotic supplements and Lactobacillus species play an important role in the production of many common foods. In the garden, Lactobacillus serum can be used as a digester, helping break down organic matter.

Lactobacilli are everywhere! It lives in the air, on plants, and in guts of all animals; without it, survival would be difficult. LB is a major digester in any bio-dynamic system, meaning it breaks down nutrients and makes them available in a form we can use [2].

Lactobacillus serum has increased no. of Lactobacilli produced by the rice wash and excess of Milk has many applications for household purposes. For eg. as an odour reducer, for clearing clogged



drains, used as an animal bedding to reduce smell and increase longevity, improves digestive efficiency in humans and animals, show great results in livestock and poultry, Disease resistance, Improves growth of plants, Compost preparation, as an Organic fertilizer and in Aquaculture [3].

The macronutrients nitrogen, phosphorous and potassium wash out of the soil over time requiring soil enrichment with fertilizer to restore the balance and help plants attain their best growth potential. The best way to ensure a good supply of these plant vitamins is to feed soil with manure or other organic material.

Application of Lactobacillus serum as organic fertilizer was of main interest to combat ill effects of chemical fertilizer.

As the demand is increasing day by day, addition of chemical fertilizer becomes mandatory to increase the quantity to fulfil everyone's need.

#### **Organic fertilizer**

Plants with therapeutic effects have received the attention of scientists as an alternative method of disease control, which would also protect our environment from the currently used hazardous chemicals. Biological control is the reduction of pathogenic populations through the actions of other living organisms, often collectively referred to as beneficial species. There is an increasing awareness that pesticides and fertilizers cause damage to the environment and affect human health. As a consequence, there is a trend toward finding ways to minimize the use of fungicides [4].

The lactobacillus serum is an organic fertilizer which is beneficial to plant growth there will be no any hazardous effect. It is easy to use and very cheap. These serum gives new direction to today's agriculture. It has much application including that the aquaculture. It is awesome for aquaculture setups.

Another focus Aquaculture is one of the fastest growing sectors, in the world. It is mainly contributing to the increase in export earning, income, employment generation and food and nutritional security for the developing countries. Emerging diseases constitute an increasingly serious threat and health problem in aquaculture by limiting the survival, growth and production of farmed fish and shellfish [5]. Several members of the lactic acid bacteria are known to produce antibacterial Substances [6]. Influenced by their work, idea of using Lactobacillus serum originated against single infected leaf.

#### **MATERIAL AND METHOD**

##### **Preparation of Lactobacillus Serum:**

1. A Carbohydrate Wash: The carbohydrate wash was prepared by rice wash and pulses wash, rinsed rice/pulses in warm and normal water.
2. It was kept for a week in a bottle. Three layers were separated: Top layer, Middle layer and the bottom layer.
3. Middle layer was extracted was put in a new container and 10 parts of milk was added to it. The container was kept for 1 week under anaerobic conditions until the curd was formed. Whey was separated by strainer and was used for further procedures.

##### **Applications of lactobacillus serum:**

1. **Organic Fertilizer:** It was used in two ways;
  - a) Approximately 2-3 tbsp of lactobacillus serum from both the combinations was added in water. The seeds were sowed and the above mixtures were used to water the plants.
  - b) Compost was prepared with the help left over curd in separation of lactobacillus Serum from Middle layer (Fig 1). It was mixed with the soil and 1-2 tbsp of

Lactobacillus serum. Control Plate contained only Soil.

In both cases the height of plant was measured at 6 days and was compared with the control.



Fig 1: Preparation of Compost by addition of Curd

## 2. Antibacterial Activity against few plant pathogens:

For Antibacterial activity Scrapping from 2 or 3 infected leaves were taken in N.B and was incubated for 24 hrs at 37<sup>0</sup>C.

High Sensitivity Agar plates were prepared with a well. Lawn was made and 0.1 ml of Lactobacillus serum was added in the well. Plates were Kept for 24hrs and results were recorded for zone of Inhibition.

## 3. In Aquaculture:

In first step, Sample from the Fish pond was taken and growth of normal flora was enumerated.

In second step, 10 ml of the Lactobacillus serum was added in an aqua tank. After 24 hrs again, the sample was collected and normal flora was enumerated.

## RESULTS AND DISCUSSION

Lactobacillus serum is very beneficial with less harmful effects. It was extracted from the rice wash, pulses wash which was one of the waste materials in our daily life showing best utilization of the waste. The organism was found to be highly active after the rice/ pulses wash was treated with raw milk. Will be advisable only when excess of milk is remaining and finishing up is a major problem.

After Fermentation, three layers were successfully separated Middle layer was of main interest as it contains many Lactic acid

bacteria. It was separated and used as Lactobacillus serum. Top layer may contain Carbohydrates and the growth of Molds, Bottom layer may contain the by-product of Fermentation. Hence, they were discarded.

Lactobacillus serum was a potent organic fertilizer as the overall growth was increased and height was also increased as compared to the control within 6 days. It was observed that the Rice wash in warm water was found to be the best as maximum growth was seen as compared to pulses wash. May be because organisms are more active in warmer temperature. Height of plant was 3 cm on first day and 15.6 cm on sixth day while the height of plants of control pot was 3 cm on first day and 11 cm on the sixth day as shown in fig 2 and fig 3.



Fig.2 Control Pot



Fig.3 Pots with Warm Water, Pulses Water, Cold Rice Water, Warm Rice Water.

Pot containing compost showed dense growth as compared to the control. It may be consuming organic nutrients and making them bioavailable which can be absorbed by the plants for their growth.

Influenced by work of Imene Fhoula *et al* [7] on antimicrobial activity of Lactic acid bacteria against pathogens isolated from Rizosphere, effect Lactobacillus serum was studied in the current project. But unfortunately, tested pathogens were found to be resistant as only 8 mm zone of inhibition was observed as shown in fig 4.



**Fig 4: Zone of Inhibition of Lactobacillus serum against plant pathogens**

Sample was taken from the fish pond and the normal flora was enumerated. 478 cfu/ml colonies were observed. After addition of Lactobacillus serum no. of colonies calculated was the same. As, fish produces waste which can be harmful to the normal flora and to the fishes as well. Lactobacillus serum digests the waste cleaning up the water thereby improving water quality. Consumption of Lactobacillus serum by fishes may improve their Digestive system. Looking forward for a more research on Lactobacillus serum and on substitution of Milk in upcoming years. But considering all other beneficial effects of Lactobacillus Serum, it should be in use in our day to day life to combat ill effects of Chemical Fertilizers, to save the fishes by improving the water quality and many more.

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