



PREPARATION OF LIQUID BIO-FERTILIZERS OF PLANT SOURCES AND THEIR EFFECT ON PLANT GROWTH

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ABSTRACT:

In this paper preparation of liquid bio-fertilizer of plant sources and their effect on plant growth by using *Moringa* leaf, Banana peel and *Aloe vera* juice. For preparation of liquid bio-fertilizers by fermentation process (Satish Mohod) different parameters like the plant height, pH, stress condition, seed germination percentage, and chlorophyll content etc have studied and all parameters showed the significant result.

Key words: - *Liquid extract, pH, chlorophyll Content, stress condition, fermentation.*

INTRODUCTION:

Bio fertilizer is a substance which contains living microorganism which, when applied to seed, plant surface or soil colonizes the rhizosphere or the interior of the plant promotes growth by increasing the supply or availability of primary nutrients. Fertilizers directly increase soil fertility by adding nutrient. Bio fertilizer add nutrients through the natural processes of fixing atmospheric nitrogen solubilising phosphorous and stimulating plant growth through the synthesis of growth promoting substance. Liquid bio fertilizers are suspension having agriculturally useful microorganisms, which fix atmospheric nitrogen and solubilise insoluble phosphate and make it available for the plant. Liquid bio fertilizer formation is the promising and updated technology which in spite of many advantages over the agrochemicals left the

considerable dispute among the farmer community in terms of several reasons, major being the viability of the organisms. Liquid bio-fertilizers increasingly available in the market as one of the alternatives to chemical fertilizers and pesticides. Bio-fertilizers add nutrients through the natural process of fixing atmospheric nitrogen, solubilising phosphorous and stimulating plant growth through the synthesis of growth promoting substances. They can be categorised in different ways based on their nature and function, one simple broadly disseminated classification is as follow

- ❖ Nitrogen bio-fertilizer.
- ❖ Phosphorous bio-fertilizer.
- ❖ Compost bio-fertilizer.

Soil is natural habitat of variety of agriculturally beneficial microorganism certain soil microorganism have and an ability to absorb

and convert atmospheric nitrogen to the readily available form for the plant where as certain soil microorganism solubilise part of the bound phosphate of the soil and thereby make them available to the plants .both these attributes make them important to be used as bio fertilizer .microorganism employed to improve availability of nutrients, viz, nitrogen by N₂phosphorous(by solubilizing soil phosphorous),to the crops are called as bio fertilizer the various microorganism having realized/prospective application as biofertilizer are bacteria (rhizobium spp, azospirillum, azotobacter) Fungi (microrhiza like glomous), blue –green algae or cyanobacteria (anabena, nostoc etc.) and azolla (a fern containing anabena azollae biofertilizer are product of elected valuable live microorganism, which help to improve plant growth and productivity mainly through supply of plant nutrients biofertilizers are also known as microbial inoculants or bio inoculants (Chan Alexander,1973; Moffett *et.al* .1983).

Synthetic/chemical manure not only provide essential nutrients to food crops but also provide simply available manner .so these fertilizers can rapidly improve increase and efficiency of food crops and or quick to gain popularity, however broad use of such fertilizer leads to serious concern .nitrate leakage and exterior /soil water toxic waste due to the augmented use of fertilizer is straight linked to human health problems. Likewise, fresh water pollution through chemical fertilizer /fertilizer remains be single of the main cause of eutrophication. Organisms to be often use while bio-fertilizer component be nitrogen fixers (N-fixer), potassium solubilises by the formulation of mold and fungi. Nearly all of the bacteria

included in bio fertilizers included close association through plants roots.

The rhizobium has symbiotic interaction by legume roots and rhizo bacteria in habit on roots surface or in rhizosphere soil. The phosphorous available to the plant. (Gupta, 2004).

A number of reports included examine the different bacterial species to solubilizer insoluble organic phosphate compounds, such as tricalcium phosphate, dicalcium phosphate, hydroxyapatite and rock phosphate. Among bacterial genera with the capacity are pseudomonas, bacillus rhizobium. Burkholderia Achromobacter, Agrobacterium, micrococcus, Azetobacter, flavobacterium and Erwinia. There are considerable population of phosphate. Solubilising bacteria in soil and in plant rhizosphere (Wani & Lee 2002).

The presence study of research how the liquid bio fertilizers are important to the plant and how they are affected plant. For detailed study the plant height, stress condition effect, pH ,chlorophyll content and seed germination percentage had studied in detail.

MATERIAL AND METHOD (SATISH MOHOD)

Material:

For the study banana peel powder 50 gm, *Moringa* leaf powder 50 gm and *Aloe vera* pulp 250 ml, yeast, distilled water, tray, soil, seed, autoclave, muslin cloth pH indicator were taken.

Method:

Prepare the sample of banana peel powder and moringa leaf powder with the help of oven at 70°C for 5 hrs. Take a two beaker of 1000 ml. In one beaker add in 500 ml distilled water and add 50 gm of *Moringa* leaf. In second beaker 500 ml distilled water and add 50 gm of *Moringa* leaf

incubate in 3 to 4 day for well mixing After the mixing filter with muslin cloth. Measure the filtrate 300 ml banana peel 250 gm *Moringa* leaf and 250ml *Aloe vera* juice mix in beaker and autoclave for 20 min. After the sterilization add a 10 gm of yeast and incubate the 5 to 7 days. Used directly when no storage. After the fermentation or prepare sample extract and use it for checking parameter. Take a 20-maize seed and wheat seed for checking growth parameter. Take two plots one plots maize and wheat for control for each. After the growing seed spray for liquid bio fertilizer in one plot and one remaining as it is weight of sample *Moringa* and banana peel powder 3, 4 days well mixing fermentation.

OBSERVATIONS

Before the treatment the length of wheat plant was the 6.5 and maize was the 2.3. After treatment: 2nd day Wheat 6.5- 7, Maize 2.3- 2.6, 4th day Wheat 6.5- 8.5 Maize 4 5.-6, 5th day Wheat 6.5- 8.6, Maize 5.5 -7, 8th day Wheat 7.5- 8.9, Maize 9.6- 10.6

Stress condition: When water supply stop after 10 days to maize and wheat plant then effect on control plant is shrink and in liquid bio fertilizer treatment plant there is no effect. Showed that water stress reduced significantly the absorption of nitrogen; phosphorous and potassium by plant, also total pigment and total chlorophyll accumulation were reduced height is decrease in control plant after stop the water. no change height in treated plant.

Chlorophyll estimation

Weight 5 gm of leaf put in mortar pastel grind the tissue of fine pulp with addition of 80% acetone, Centrifuge and transfer the supernatant of volumetric flask. Grind the tissue residue with 20 ml of 80% acetone centrifuge

and transfer the supernatant to same volumetric flask Repeat the procedure until the residue colourless wash the mortar and pestle through with 80% acetone and collect the sample. Read the absorbance of solution at 645 and 663 nm, against the solvent 80% acetone as a blank.

RESULT AND CONCLUSION:

Before the treatment the length of wheat plant was 6.5 and maize were 2.3. After the treatment wheat and maize plant height is highly increased than the control plant. After the 8th day in control condition the maize is 9.6 and wheat is 7.5. Treatment plant height maize is 10.6 and wheat is 8.9. In this project before treatment pH is 8.0 and after treatment 8.5 pH which is more basic than before treatment 10% more germination percentage in treatment condition than the control in maize and in wheat 5% more germination percentage in treatment than the control. In this paper control plant chlorophyll pigment is 0.260, 0.340 and treatment plant is 0.066 and 0.345 nm. In this project 10 days stress condition observed in control condition plant height decrease. Treated plant shows no change in height.

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