

In-Vitro Efficacy of Jeevamrut against Pathogenic Fungi *Aspergillus Niger*

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Abstract: *Jeevamrut is liquid organic manure. It Improves soil health and plant immunity. Jeevamrut is also rich in beneficial microorganisms that control the growth of pathogenic fungi. Pathogenic fungi such as Aspergillus niger is a highly destructive, causes severe plant decay and produces toxins. It is also pathogenic to human being. Present study helps to know the efficacy of jeevamrut for controlling the mycelial growth of Aspergillus niger (in-vitro). The different concentrations of jeevamrut were tested against Aspergillus niger. 40% and 60% concentration of jeevamrut significantly reduced the mycelial growth of Aspergillus niger. As concentration increases growth of Aspergillus niger decreases. So, Jeevamrut is act as natural antagonist against Aspergillus niger.*

Keywords: Jeevamrut, Pathogenic, Organic. Antagonist.

I. INTRODUCTION

Jeevamrut is fermented liquid organic formulation used as organic manure or fertilizer. It is simply made up of cow dung, cow urine, jaggery, gram flour, soil and water. It is rich in beneficial bacteria, fungi, actinomycetes, P-solubilizing bacteria and N-fixers. It improves aeration, water holding capacity and organic carbon content so ultimately improves immunity of plants. Jeevamrut contains plant growth hormones like auxins and gibberellins. Antagonistic microbes found in jeevamrut inhibit soil borne pathogens. *Aspergillus niger* is one of the destructive soil borne pathogenic fungi. It is a filamentous ascomycete fungus which is ubiquitous. It is a soil saprobe and plays vital role in decaying organic matter by producing hydrolytic enzymes. *A. niger* causes postharvest decay and black mold disease in fruits, vegetables, and stored grains. *A. niger* a pathogenic fungi responsible for crown rot in peanuts which causes pre- and post-emergence seedling damping-off. It causes rapid rot in many fruit crops such as grapes, mangoes, pomegranates, olives and citrus. In such a way *A. niger* leading to significant economic losses in the agriculture. So management of *A. niger* is necessary. Present study helps to insight ecofriendly management of *A. niger* by jeevamrut in vitro.

II. MATERIAL AND METHODS

A. Isolation of pathogen-

The pathogen *Aspergillus niger* responsible for decaying fruits was isolated from affected fruit parts. Infected parts were cut into small pieces aseptically and transferred to the petriplates containing CDA (Czapek's Dox Agar) medium. These plates were incubated for 7 days and obtained pure culture of *Aspergillus niger*. Pathogen identification was carried out by its pathogenicity, cultural characteristics, spore morphology and relevant literature.

B. Preparation of Jeevamrut-

Jeevamrut was prepared by using 1 Kg cow dung, 1lit. cow urine, 200 g jaggery, 200 g chickpea flour and 100g virgin soil. The final volume of mixture was made to 20 lit. by adding water. The mixture was kept in shade for 7-8 days. Stirred the mixture three times in day. Prepared Jeevamrut filtered and used for further investigation.



C. Inoculation of fungi-

Jeevamrut is used for preparing different concentrations such as 10%, 20%, 30%, 40%, 50% and 60% by addition of distilled water. These concentrations added with media separately and autoclave it. The prepared media poured into plates aseptically. Triplicate set was prepared for each concentration of Jeevamrut. Media plate without jeevamrut considered as control. Media plates inoculated by actively growing seven days old culture of *Aspergillus niger*.

The growth of fungus was recorded by measuring mycelial growth in mm. upto 7 days.

III. OBSERVATIONS

The mycelial growth of *Aspergillus niger* was recorded on different concentrations of jeevamrut plates upto seven days. The following table indicates the growth of mycelium in mm of 7th day.

Table 1: In-vitro effect of jeevamrut against *A. niger* at different concentrations.

Sr. No.	Concentration of Jeevamrut (%)	Growth of mycelium in mm after 7 days
1.	10	52
2	20	40
3	40	15
4	60	06
5.	Control	80

Table no. 1 showed mycelial growth of *A. niger* decreases with increasing jeevamrut concentration. At minimum concentration of jeevamrut growth of *A. niger* is high while at highest concentration of jeevamrut mycelial growth reduces as compared to control.

IV. RESULT AND DISCUSSION

Growth of *A. niger* at 10% jeevamrut concentration was 52 mm while it reduced as concentration of jeevamrut increases. At 60% jeevamrut concentration mycelial growth of *A. niger* significantly reduced upto 06 mm. It indicates that Jeevamrut inhibited the growth of *A. niger* as concentration increases. Jeevamrut has shown antifungal activity against various pathogenic fungi. A study found that bacteria isolated from jeevamrut showed antagonistic activity against *Sclerotium rolsfii*, with incubation percentage ranging from 28.75-47.78%^[10]. Jeevamrut is fermented organic manure having different microbes including bacteria that compete for nutrition to other microbes. So it reduces the growth of fungi. Also Jeevamrut having cow urine and cow dung having antifungal properties that inhibits the growth of fungi.

V. CONCLUSION

Jeevamrut inhibits growth of *Aspergillus niger* but it depends on dose concentration. Maximum inhibition (90%) of *A. niger* observed at 60% concentration. Jeevamrut have potential as biofungicide for managing *Aspergillus niger*.

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