ISSN 2582 – 6050

Available Online at www.ijpba.info
International Journal of Pharmaceutical & Biological Archives 2020; 11(1):34-36

RESEARCH ARTICLE

Growth Pattern of *Paecilomyces lilacinus* in Different Eco-friendly Media

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Received: 26 November 2019; Revised: 10 January 2020; Accepted: 25 February 2020

ABSTRACT

Paecilomyces lilacinus is a common saprophytic, filamentous fungus. Morphological characters of *P. lilacinus* were separate mycelium, hyaline, conidia white to pink colored, and formation of phialides. The growth of *P. lilacinus* carried out on Sabouraud dextrose agar, coconut, molasses, and potato dextrose agar media at room temperature was better than incubator (25°C). The fungus has the capacity to colonize the rhizosphere and to grow in close association with nematodes. *P. lilacinus* was mass multiplied in both solid substrate for sorghum grains and liquid media for coconut water. Effect of temperature on the growth of *P. lilacinus* wasstudied in solid substrate (sorghum grain) and liquid media (coconut water) at different temperature, namely, 15, 20, 25, 30, and 35 ± 1°C. Number of colonies forming units in sorghum grain was found to be maximum at 30 ± 1°C followed by 35 ± 1°C. In liquid media (coconut water) also, maximum dry mycelial weight was recorded at 30 ± 1°C which was on par with 35 and 25 ± 1°C. It shows effect of temperature on the mycelial growth.

Keywords: Mass multiplication, media, *Paecilomyces lilacinus*, temperature

INTRODUCTION

Paecilomyces lilacinus is an important biocontrol agent of several plant parasitic nematodes. Once a biocontrol fungus has shown potential for disease control based on laboratory, green house, and field trails, production of an effective biomass becomes major concern. In recent years, few environmental issues have aroused the concern of the public as much as pesticides, especially in relation to the health of children. In spite of the many publishedstudies on the subject of pesticides and human health, there remains deep controversy surrounding this crop. Biopesticides are key elements of incorporated insect management programs and are receiving much practical attention as a means to reduce the fill of artificial chemicals being used. There is a need to create biopesticides which are effective, eco-friendly, and do not leave any harmful effect on environment.[1-8]

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The first step in the production of biocontrol fungi is the development of suitable medium using inexpensive, readily available agriculture by-product with appropriate nutrient balance. Many times, workers have trying to produce successfully cheap agriculture waste and by-products for the mass production of *P. lilacinus*. The common substrate used was grains and oil cakes, sugarcane by-products, and plant leaves. Biopesticides are certain types of pesticides derived from such natural materials as animals, plants, bacteria, and certain minerals.

These include, for example, fungi such as *Paecilomyces* sp. and *Beauveria* sp. and bacteria such as *Bacillus* sp., neem extract, and pheromones. Similarly, canola oil and baking soda have pesticide applications and are considered as biopesticides. The use of these materials is widespread with applications to foliage, turf, soil, or other environments of the target insect pests. Biopesticide markets and environmental concerns limit the use of chemical pesticide products.

Biological control has attracted a lot of attention in the management of pests and diseases as an

alternative to the chemical control. *Paecilomyces* sp. has the potential for biological control of nematodes. This soil fungus has been reported to interfere with nematode population densities and has been gaining popularity due to its capability to manage plant parasitic nematodes.

MATERIALS AND METHODS

Source of the bioagent

Paecilomyces culture was provided in Vise Organic Company.[9-11]

Procedure

A weight 3.25 g of Sabouraud dextrose agar (SDA) was suspended in 50 ml of sterile distilled water and heated to completely dissolve the media. The dissolve media was sterilized by autoclaving at 121°C for 15 min. The molten SDA was poured in the sterile Petri dishes and allowed to solidify in a laminar flow for 45 min. And then, *P. lilacinus* culture was inoculated. The fungi were allowed to grow in the SDA media in the room temperature. Similarly, prepare plates of molasses agar plate, potato dextrose agar (PDA) plates and coconut water agar plates.

Once the lawn growth was obtained the mycelia along with the spores were transferred to liquid media, i.e., jaggery media, coconut water media, molasses media, and potato dextrose broth to observe the growth of the fungi on liquid media.

Enumeration of the spores

A total of 2.5 g of conidia were scooped from the growth obtained which was then added to the 10 ml of water and centrifuged at the speed of 4000 rpm. The suspension was the filtered with the help of muslin cloth. The obtained liquid was then observed with the help of hemocytometer for the fungal spore count [Table 1].

RESULTS AND DISSCUSION

Multiple types of media were used to observe the growth of *P. lilacinus*. The growth takes place rapidly in molasses media and PDA media. The growth takes around in around 25–30 days to cover the whole flask of 500 ml of media.

Table 1: Mycelial weight and spore load of fungus multiplied in different media

Media	Mycelial weight in gram	Spore load×10^8 CFU/ml of medium
SDA	0.5	0.28
Molasses media	0.5	0.20
Coconut media	0.5	0.18
Sorghum grain	0.5	0.23
PDA	0.5	0.25

SDA: Sabouraud dextrose agar, PDA: Potato dextrose agar

Highest and most effective biomass growth was observed when it was incubated at the temperature of 26 ± 2°C. The media that showed the higher density of fungal spores were SDA while showed slightly lower density of spores followed by molasses, but the coconut media showed lowest spore count as compared to the mycelial weight.

Thus, SDA shows to be the best media for the growth of *P. lilacinus,* but in reference to cost, molasses prove to be the effective media that will not cost much needful produce.

CONCLUSION

Effect of temperature on the growth of *P. lilacinus* was studied in solid substrate (sorghum grain) and liquid media (coconut water) at different temperature, namely, 15, 20, 25, 30, and 35 ± 1°C. Number of colonies forming units in sorghum grain was found to be maximum at 30 ± 1°C followed by 35 ± 1°C. In liquid media (coconut water) also, maximum dry mycelial weight was recorded at 30 ± 1°C which was on par with 35 and 25 ± 1°C. It shows effect of temperature on the mycelial growth.

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