ISSN (E): 2320-3862
ISSN (P): 2394-0530
www.plantsjournal.com
JMPS 2021; 9(4): 42-43

Received: 18-05-2020
Accepted: 20-06-2021

Supriya Pandey
Department of Plant pathology, School of Agriculture, Uttaranchal University, Dehradun, Uttarakhand, India

Rajendra Prasad
Department of Plant pathology, School of Agriculture, Uttaranchal University, Dehradun, Uttarakhand, India

Sandeep Kumar
Department of Plant pathology, School of Agriculture, Uttaranchal University, Dehradun, Uttarakhand, India

Mahipal Singh
Department of Plant pathology, School of Agriculture, Uttaranchal University, Dehradun, Uttarakhand, India

Corresponding Author:
Supriya Pandey
Department of Plant pathology, School of Agriculture, Uttaranchal University, Dehradun, Uttarakhand, India

Effect of different botanical extract on mycelial growth of *Pleurotus florida* (Mont.)

Supriya Pandey, Rajendra Prasad, Sandeep Kumar and Mahipal Singh

Abstract
Oyster mushroom (*Pleurotus florida*) is commonly called as Dhengri in India because of its oyster like shape. Many fungicides and pesticides are using in the production of spawn and fruiting bodies of edible mushroom. The high dose of such chemicals although used for sterilization of substrate and control of pathogen and pest but have issues of side effects. These are highly toxic and hazardous to the environment and human health. In present study some botanical extracts *viz*., neem (*Azadirachta indica*) and Eucalyptus (Eucalyptus globulus) were tested in-vitro conditions on the mycelial growth of *P. florida* and observed for any reduction or enhancement. Experiment was carried out by Poisoned Food Technics. The results showed that neem extract enhanced the mycelial growth of *P. florida*, however, Eucalyptus extract shown lesser effect on growth of fungal mycelia. Maximum growth of mycelia of *P. florida* were observed after nine days by neem leaf extract of 2% followed by 4% as compare to the control without any extract. The both concentrations i.e., 2% and 4% of Eucalyptus extract inhibited the mycelial growth of *P. florida*, respectively. The neem leaf extract could be a good biological alternative that can be used for sterilization of substrate for the production of edible mushroom.

Keywords: Botanical extracts, poison food technique, *Pleurotus florida* mycelia growth

Introduction
Mushrooms are rich in proteins, vitamins, and minerals and popularly called as the vegetarian's meat. Mushroom proteins are considered to be intermediate between that of animals and vegetables as it contains all the nine essential amino acids required for human body. Oyster mushroom (i.e. *Pleurotus sp*.) is commonly called as Dhengri in India because of its oyster like shape. Genus Pleurotus belongs to family Tricholomataceae and has about 40 well-recognized species, out of which 12 species are cultivated in different parts of country. *Pleurotus* is an efficient ligninde grading mushroom and can grow well on different types of lignocellulolosic materials. Cultivation of Mushroom is very simple and low cost production technology, which gives consistent growth with high biological efficiency. It was first cultivated in Germany as a subsistence measure during World War I and is now grown commercially around the world for food. The nutritional information for a 100 gram or 3.5 ounce serving of oyster mushrooms has only 33 calories and 0.4 grams of fat. The use of chemicals for spawn production and yield production in oyster mushroom cultivation is very common in India. Application of chemicals to mushroom substrate is practiced frequently worldwide.

Many chemicals are using in the production of spawn and yield are highly toxic and hazardous to the environment, and human health also. Constant use of fungi-toxic chemicals adds to the food chain poisoning, environmental pollution and increase the chance of resistance development. The use of plant extract has opened a new avenue for the increasing the production. Besides, being safe and generally non-phytotoxic, the plant extracts are known to be effective against plant pathogen also. Extracts of many plants have been reported to exibit antibacterial, antifungal, and insecticidal properties under laboratory trial. These plant extracts offer a viable choice which are non-persistent in the environment and safer to use.

Materials and Methods
The present study is mycelial growth of *Pleurotue florida* against different botanicals extract in laboratory. The study was conducted at Laboratory Department of Plant Pathology School of Agriculture, Uttaranchal University, Dehradun, Uttarakhand.

Establishment of pure culture

The pure culture of *Pleurotue florida* sample were obtained from Directorate of Mushroom Research, Solan, Himachal Pradesh. After that the sample was sub-culture in Petri plates on Potato Dextrose Agar Medium (PDA) and incubated in B.O.D at 21-24°C for 8-10 days.

Preparation of extracts

For the preparation of Botanical extracts, first plants leaves Neem (*Azadirachta indica*), Eucalyptus (*eucalyptus globulus*) were taken and washed in tap water and air dried after that make a fine powder with the help of electric grinder machine and soak the powder in distilled water at 1:10ratio for 24hrs. Filter the soaked materials through double layered muslin cloth.

***In vitro* Evaluation of Botanicals Extract Treatment**

Poison Food Technique were used to check the effect of different Botanical extract doses 2% and 4% (standard solution) was incorporated in 100 mL of potato dextrose agar medium (PDA) sterilized by autoclaving at 121°C (15 lbs pressure) for 20 minutes. The molten media were poured into three sterilized glass petri plates (90 mm) considering each as a replication. After solidification of the agar plates were inoculated with 8 mm diameter mycelial cut from 10 days old culture of *P. florida*. The media without the botanical extract served as check. The plates were incubated at 27±1°C till the complete growth was observed in control plates. The observation was collected mycelial growth (mm) in three days interval.

Result and Discussion

In the study of different botanical extract were obtained mycelia growth of *P. florida*. The *P. florida* was inoculated in PDA media Petri plates. The Petri plates were incubated at 23±2°C for 9 days and observations were recorded at each 72 hrs. The result was presented in (Table 1and figure 1) all plant extracts were founded more or less mycelial growth of mushroom. Maximum growth was observed in Neem leaf extract @ 4% (88 mm) followed by Neem leaf extract @ 2% (76 mm) and 80 mm in control without extract. The Eucalyptus was recorded less inhibited the mycelial growth of *Pleurotus* (25.67 and 44.33 mm) @ 4 and 2 percent of Eucalyptus extract respectively.

After three days observation maximum radial growth in T4 (14.00 mm) followed by in T1 (11.00 mm), T3 (9.33 mm), then minimum growth was observed after three days in T2 (9.0 mm). After six days observation was founded maximum in T4 (42.33 mm) followed by T3 (26.67 mm), T1 (20.33 mm) and minimum growth was observed after six days in T2 (15.67 mm). After nine days observation was founded maximum in T4 (88.00 mm) followed by T3 (76.00 mm), T1 (44.33 mm) and minimum growth was observed after nine days in T2 (25.67 mm).

Kumar *et al*., (2018) were similarly observed maximum mycelial growth in neem extract (81.25 mm) and (81.00) in 2 and 4% concentration. Among the botanicals, eucalyptus leaf extracts showed found less effective against the mycelium growth.

Table 1: Effect of different Botanical extract on Mycelia Growth (mm) of (*Pleurotue florida*)

Treatment	Dose%	Radial growth of *P. florida*		
		3 DAI	6 DAI	9 DAI
T1- Eucalyptus	2%	11.00	20.33	44.33
T2- Eucalyptus	4%	9.00	15.67	25.67
T3- Neem	2%	9.33	26.67	76.00
T4- Neem	4%	14.00	42.33	88.00
T5- Control		15.67	30.00	80.00
C.D at 5%		0.11	0.29	0.15
S.E(m)		0.72	1.80	0.92

Fig 1: Radial mycelia growth of *P. florida* against botanical extracts

Conclusion

Thus, it can be concluded that maximal mycelial growth and growth rate/day of *Pleurotus florida* can be achieved by Neem leaf extract @ 4% maximum mycelial growth and growth rate obtained. The minimum mycelial growth was founded in Eucalyptus @2% leaf extract. Eucalyptus is a highly inhibited the growth of mycelium.

References

1. Nayak N, Rani R, Jha S, Datri S, Jha R, Singh P *et al*. Efficacy of Botanicals and Hot Water treatment on production of Pleurotus florida. International Journal of Research 2015;2:2348-795.
2. Kumar S. *In-vitro* evaluation of mycelial growth of *Pleurotus sapidus* against different botanicals. Journal of Pharmacognosy and Phytochemistry 2019;8.1:655-65.
3. Pervez Z, Islam M, Islam SMA. Evaluation of some plant extracts in controlling green mold (Trichoderma harzianum) associated with substrate of oyster mushroom. Bangladesh Res Pub 2012;7:194-200.
4. Kangjam Valenta, Abhilasha Lal A, Simon S. Effect of botanicals on incidence of green mold and yield of oyster mushroom (Pleurotussajor-caju). Annals of Plant Protection Sciences 2017;25.2:447-448.
5. Ahmed SA. Biological efficiency and nutritional contents of *Pleurotus florida* (Mont.) Singer cultivated on different agro-wastes. Nature and science 2009;7.1:44-48.