EVALUATION OF DIFFERENT WAVELENGTH (COLOUR OF LIGHT) ON RADIAL GROWTH OF PLEUROTUS EOS (PINK OYSTER MUSHROOM)

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Abstract: The effect of different colors of light on radial growth of P. eous was studied under in vitro condition in Mushroom Research Laboratory Department of Plant Pathology, College of Agriculture, IGKV, Raipur at 2011-12. The radial growth of P. eous in blue light with 455-492 nm wavelength favor highest significant growth (88.50 mm) followed by Red wavelength 622-780 nm with (78.50 mm) and pink wavelength 600-650 nm with (76.50 mm) growth. However radial growth P. eous were recorded at par in purple wavelength 390-455nm (65.50 mm), yellow wavelength 577-597nm (68.50 mm), transparent 1520-1580 nm (70.50 mm) as compare to control (65.50 mm). The least radial growth was observed in green wavelength 492-577nm (43.50 mm). The Mycelial character of wavelength 455-492 nm was whitish pink dense cottony mycelial growth with regular margin and wavelength 622-780 nm was White dense mycelial growth with regular margin. The Mycelial character of wavelength 492-577 nm was white cottony mycelial growth with regular margin. This wavelength shows very poor growth.

Keywords: Pink oyster mushroom, Pleurotus eous, wavelength, color light

INTRODUCTION

Oyster mushroom Pleurotus spp. commonly known as oyster fungus, is a common primary decomposer of wood and vegetal residues (Zadrazil and Kurtzman, 1982). It can be naturally found in tropical and subtropical rainforests, and can be artificially cultivated (Maziero et al., 1992). Appreciated because of its delicious taste, this fungus has high quantities of proteins, carbohydrates, minerals (calcium, phosphorus, iron) and vitamins (thiamin, riboflavin and niacin) as well as low fat (Sturion and Oetterer, 1995; Justo et al., 1998; Manzi et al., 1999). For many reasons the fungi of the Pleurotus genus have been intensively studied in many different parts of the world they have high gastronomic value. They are able to colonize and degrade a large variety of ligno-cellulosic residues, they require shorter growth time when compared to other edible mushrooms, they demand few environmental controls, their fruiting bodies are not very often attacked by diseases and pests and they can be cultivated in a simple and cheap way (Jwanny et al., 1995; Patrabansh and Madan, 1997). Aschenabery (1960) obtained the importance of blue light in morphogenesis of cultivated mushroom. Perkins and Gordon (1969) studied the exposure-response relationship for induced fruiting was determined for light of 448 nm. The Bunsen-Roscoe Law of Reciprocity was found to hold for the photo induction of fruiting bodies for the interval 36 to 2000 sec with light of 448 nm. Light of wavelengths from 320 nm to 525 nm induced fruiting bodies. Although the photoreceptor is unknown, it may be a flavin rather than a carotenoid, because light in the near ultraviolet (350 nm–400 nm) was inductive. Neither red light (660 nm) nor far-red light (730 nm) induced fruiting bodies or affected the sensitivity of the fungus toward photo induction by blue light (448 nm). Gyurko (1972) studied different colors of light and reported blue light to be most suitable for the growth of Pleurotus spp. Yang (1984) observations and regular measurements of the length and quantity of mycelium in culture at the photosensitive stage, strong illumination (600 lx) was unfavorable to growth, while diffused light (30 lx) and complete darkness had little effect. The mycelium grew well under yellow light and green light, but growth was inhibited under red and blue light. Chaurasia (1997) studied different colors of light on radial growth of P. columbinus and recorded maximum radial growth in green colored light followed by yellow colored. Danai et al. (1998) obtain a colony of P. ostreatus with optimal sensitivity to light induction the first generation had to be grown in the dark. illumination by wavelengths of 500-660 nm (green light) sufficed to induce primordial, whereas the further development of sporophores required illumination with white light (400-600 nm). Alasadour (2002) observed overall fruit-body production at 20 C light above 100 lux is necessary and light remains a limiting factor up to about 1, 000 lux. Under continuous light of suitable intensity, fruit-bodies continue to develop and discharge global-masses for many weeks. Newman (2002) found that the rate of mycelial growth was little affected by darkness but the formation of primordia was retarded. On cultures incubated for up to 23 days in darkness basidiospores subsequently formed only when the cultures had 48 h exposure to light, the greatest number of primordia and ripe fructifications forming in continuous light. The light stimulus was not transmitted through the mycelium. Once primordia were initiated in light their further development was little affected by either the quality or intensity of light. Production of primordia and sporulation occurred in blue, red and white light.
MATERIAL AND METHOD

The influences of different colors of light were studied under laboratory condition to find out the best color of light for the radial growth and *P. eous* 20 ml of PDA media was poured in Petridis. 5 mm disc of ten days old culture of test fungus was placed in the center of medium then Petridis were wrapped with different colors of gelatin paper i.e. yellow, red, pink, green, blue, violet (bluish purple) and transparent. Suitable control was maintained which was not covered with any of the colored gelatin paper. These Petridis were then placed in front of tube light in growth chamber. The three replications were maintained for each treatment and observation recorded for mycelium growth at alternate days after inoculation up to ten days.

RESULT AND DISCUSSION

The effect of different colors of light on radial growth of *P. eous* was studied under *in vitro* condition and results are presented in table, Fig. and Plate. The data from the table depict that the radial growth of *P. eous* in blue light with 455-492 nm wavelength favor highest significant growth (88.50 mm) followed by Red wavelength 622-780 nm with (78.50 mm ) and pink wavelength 600-650 nm with (76.50 mm) growth. However radial growth *P. eous* were recorded at par in purple wavelength 390-455nm (65.50 mm), yellow wavelength 577-597nm (68.50 mm), transparent 1520-1580 nm (70.50 mm) as compare to control (65.50 mm). The least radial growth was observed in green wavelength 492-577nm (43.50 mm).

The Mycelial character of wavelength 455-492 nm was whitish pink dense cottony mycelial growth with regular margin and wavelength 622-780 nm was White dense mycelial growth with regular margin. The Mycelial character of wavelength 492-577 nm was white cottony mycelial growth with regular margin. This wavelength shows very poor growth.

The present findings are very close to the results obtained by Aschen-abery (1960) obtained the importance of blue light in morphogenesis of cultivated mushroom. Gyurko (1972) who reported blue light to be most suitable for the growth of *Pleurotus* spp. Newman (2002) found that the production of primordia and sporulation occurred in blue, red and white light.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Light Colour</th>
<th>Wavelength range (nm)</th>
<th>Radial growth (mm)*</th>
<th>Mycelial character</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blue</td>
<td>455-492</td>
<td>88.50</td>
<td>Whitish pink dense cottony mycelial growth with regular margin.</td>
</tr>
<tr>
<td>2</td>
<td>purple</td>
<td>390-455</td>
<td>65.50</td>
<td>Whitish Pink mycelial growth with regular margin.</td>
</tr>
<tr>
<td>3</td>
<td>Pink</td>
<td>600-650</td>
<td>76.50</td>
<td>Pinkish cottony mycelial growth regular margin.</td>
</tr>
<tr>
<td>4</td>
<td>Green</td>
<td>492-577</td>
<td>43.50</td>
<td>White cottony mycelial growth regular margin.</td>
</tr>
<tr>
<td>5</td>
<td>Yellow</td>
<td>577-597</td>
<td>68.50</td>
<td>Whitish pink cottony mycelial growth with irregular margin.</td>
</tr>
<tr>
<td>6</td>
<td>Red</td>
<td>622-780</td>
<td>78.50</td>
<td>White dense mycelial growth with regular margin.</td>
</tr>
<tr>
<td>7</td>
<td>Transparent</td>
<td>1520-1580</td>
<td>70.50</td>
<td>White cottony mycelial growth with irregular margin.</td>
</tr>
<tr>
<td>8</td>
<td>control</td>
<td></td>
<td>65.50</td>
<td>White cottony mycelial growth with regular margin.</td>
</tr>
</tbody>
</table>

SEm± 1.91
CD 5.73

*Average of three replications
**Fig.** Evaluation of different wavelength (colour of light) on radial growth of *Pleurotus eous*
REFERENCES


