

## The Sclerotia Formation of *Polyporus umbellatus* on the Logs

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### 인공접종된 원목에서 저령의 균핵형성

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**ABSTRACT:** This study was carried out to obtain the basic data for artificial production of *Polyporus umbellatus*. Among logs consisted of 16 tree species, the log of *Stylax japonica* inoculated with *Polyporus umbellatus* not only produced compact sclerotia of 3~5 mm in their diameters but resulted in the good mycelial density. Also, the sclerotia were observed on 6 different kinds of logs inoculated with *Polyporus umbellatus*.

**KEYWORDS:** *Polyporus umbellatus*, *Stylax japonica*, Sclerotia, Log

*Polyporus umbellatus*, one of the edible fungi belongs to Polyporaceae of Basidiomycetes and is termed officially as *Grifola umbellata* or *Dendropolyporus umbellatus* in the other scientific name (Lee, 1988; Liu, 1978). *P. umbellatus* has been collected from woody plant in nature and is considered as herb medicine in Asia. Nowadays, the substances of polysaccharide such as *B*-glucan which was isolated from fruiting bodies of *P. umbellatus* have been reported to exhibit outstanding anti-tumor effect for curing human disease such as lung cancer, garistic

cancer and cervical cancer (Sato *et al.* 1984; Lee, 1986).

Though *P. umbellatus* has been considered as one of the most promising edible fungi in the global market, one of unsolved problems may remain in the difficulty of its mass production capable of corresponding to the demand of many users. Therefore, this study was carried out to find the possibility for an artificial production of *P. umbellatus*. Based on logs consisted of 16 tree species, the inoculation of *P. umbellatus* was performed. After 70 days of incubation, the observation was carried out to find if sclerotia of *P. umbellatus* were produced on the logs.

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**Table 1.** The mycelial growth of *Polyporus umbellatus* on the logs of 16 tree species treated with 'single inoculation of *P. umbellatus*

Tree species <sup>a</sup>	Korean name	Mycelial growth (cm) <sup>b</sup>	Mycelial density	Sclerotia formation
<i>Pinus densiflora</i>	소나무	16b <sup>d</sup>	+	-
<i>Prunus serrulata</i>	벚나무	20a	++	-
<i>Larix kaempferi</i>	낙엽송	17ab	+	-
<i>Styrax japonica</i>	매죽나무	20a	++++	+++
<i>Castanea crenata</i>	밤나무	20a	+	-
<i>Diospyros kaki</i>	감나무	20a	++	-
<i>Pinus koraiensis</i>	잣나무	20a	++	-
<i>Stewartia koriana</i>	노각나무	20a	+++	+
<i>Alnus japonica</i>	오리나무	20a	++	+
<i>Cornus controversa</i>	층층나무	20a	++++	++
<i>Populus alba</i> × <i>tomentiglandulosa</i>	은수원사시	20a	+++	+
<i>Acer palmatum</i>	단풍나무	20a	+++	+
<i>Pinus rigida</i>	리기다	20a	+	-
<i>Quercus serrata</i>	졸참나무	18ab	+	-
<i>Robinia pseudo-acacia</i>	아까시나무	20a	++++	-
<i>Ulmus daviana</i>	느릅나무	15b	+++	-

<sup>a</sup>These trees were sterilized 3 times for 50 minutes at 121°C and then inoculated with *P. umbellatus*.

<sup>b</sup>Each result was measured longitudinally after 70 days of inoculation.

<sup>c</sup>This was carried out by inoculating *P. umbellatus* on the top of each log.

<sup>d</sup>The different letters were significantly different at  $p=0.05$  according to Duncan's new multiple range test.

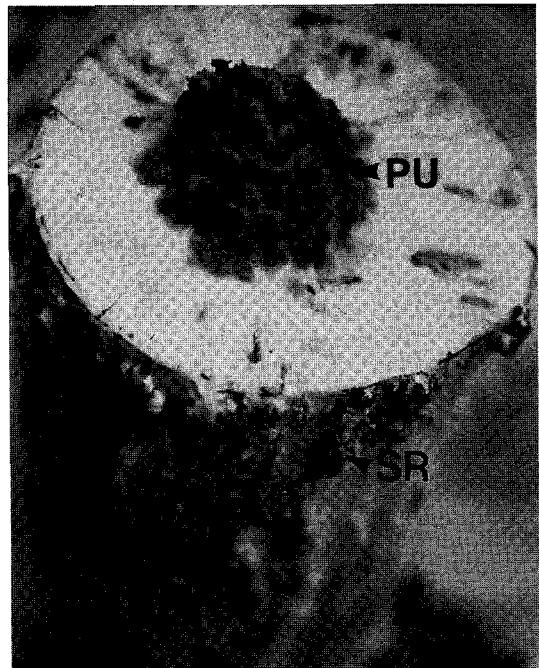
Density degree: +++++, Compact; +++, Somewhat compact; ++, Somewhat thin; +, Thin; -, None

## Materials and Methods

Each log (15 cm in diameter) was cut to length of 30 cm for fungal inoculation and soaked in water for 24 hours. After that, the log was put into polyethylene bag (20×45 cm) and sterilized for 150 minutes at 121°C. The top of each log was inoculated with *P. umbellatus*, and incubated under darkness for 70 days at 20°C.

## Result and Discussions

The sclerotia were observed on 6 different kinds of logs inoculated with *P. umbellatus* (Table 1). Among logs consisted of 16 tree species, the log of *Stylax japonica* not only produced compact sclerotia of 3~5 mm in their diameters but resulted in the good mycelial density (Fig. 1). Paul (1993) mentioned that the sclerotia of *P. umbellatus* could be obtained in relative humidity of 90~100%.



**Fig. 1.** The sclerotia production of *Polyporus umbellatus* on the log of *Stylax japonica* inoculated with *P. umbellatus*. PU, *P. umbellatus* as an inoculum; SR, Sclerotium of *P. umbellatus*.

According to our results, we believe that the relative humidity can be obtained in case that water is absorbed in the tissues of log for 24 hours. Presumably, this result appears to offer suitable data for producing fruiting body of *P. umbellatus*.

### 적 요

16종의 원목에 저령을 인공접종한 결과, 때죽나무의 원목에서 3~5 mm 크기의 조밀한 균핵이 다수 관찰되었으며, 왕성한 균사의 밀도를 나타내었다. 균핵의 형성은 16종의 원목 중 6종의 원목에서 관찰되었다.

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