Optimum Design of Red and Blue Lighting Sources for Promoting the Growth of *Antrodia Cinnamomea*

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There are a vast numbers of methods to raise *Antrodia Cinnamomea*, such as solid fermentation, submerged culture, wood cultivation, etc. No matter how to breed this kind of fungus, it cannot grow without mycelia by any above way. This research will take advantage of orthogonal array as a mathematical tool to work the experiments, which are carried on by short-time LED lighting sources. This artificial light source will stimulate *Antrodia Cinnamomea*, shorting the growing time of raising those mycelia. This research will focus on the blue lights, the red lights and the on/off periods of these artificial lights. According to the results after the experiments, it virtually improved that some special light source made an obvious effect on *Antrodia Cinnamomea*. The red light is operated at 1 Lux, and the blue one is at 20 Lux; furthermore, the lights are turned on for 15 minutes every 6 hours. This is the best condition for *Antrodia Cinnamomea* to live. Its weight increases 27.7%, diameter increases 23.2%, the spectrum area of Triterpenoids increases 43.9%, and the growing time decreases 20.0%.

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