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Abstract

The Effects of Light on the Enzyme Production of *Trichoderma atroviride* †

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The behavior of living organisms is influenced by sunlight, which is an environmental key factor. Ambient light influences many processes involved in growth, development, and reproduction metabolism [1]. Processes like signal transduction, blue-light perception and related responses have been extensively studied in plants, bacteria, algae and fungi [2]. A common soil fungus, *Trichoderma atroviride* can be used as a biocontrol agent because it has the capacity to parasitize phytopathogenic fungi. Conidiation, asexual reproduction, is influenced by light and the presence of certain nutrients [3]. The expression of some enzymes, such as lignocellulolytic ones, was shown to be regulated by light as well [4]. The aim of the study was to test the effects of blue-light laser radiation on the production by *T. atroviride* of enzymes that degrade lignocellulytic biomass. *T. atroviride* were grown on PDA medium at 28 °C for 5 days. The mature spores were removed and inoculated into ISM medium. To induce biomass-degrading enzymes the mycelium from ISM was incubated in water supplemented with rice husk in Erlenmeyer flasks on a rotary shaker at 28 °C for 15 days. The samples were subjected to blue-light laser for 60 and 300 s at three laser intensities and at different incubation time intervals. The supernatant was sterilized by filtration and used to determine the enzymatic activities, cellulases, proteases and laccases. Irradiation of *T. atroviride* with blue-light laser was found to influence the cellulase and protease activities. The highest cellulase and protease activities were observed in the case of 60 s irradiation at a laser intensity of 0.271 µmol/s. Some effects seem to follow a hormesis behavior which needs further investigation. Neither the treated samples nor the controls presented any laccase activity. Our results indicate an increase in enzymatic activities for *T. atroviride* when exposed to medium intensity of blue-light laser for 60 s.

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