

14th World Bioenergy Congress and Expo

June 06-07, 2019 | London, UK

Effects of LED on mycelium weight and cordycepin content of submerged cultured vegetable worms (*Cordyceps militaris*)

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More recently, *Cordyceps militaris* has been widely used due to its folkloric activities, which are not based on scientific studies. Cordycepin (3'-deoxyadenosine), a metabolite of *C. militaris*, has been showed to inhibit the growth of various tumor cells. Previous work reported the isolation of cordycepin from liquid culture medium of *C. militaris* and its pharmacological functions. But, as far as we know, there is limited knowledge about the light emitting diode (LED) condition for cordycepin production by *C. militaris*. In this paper, the effects of LED were focused in order to improve the cordycepin production by submerged cultivation of *C. militaris*. For this experiment, mycelial cultivation was performed in a shaking incubator at 24°C, 100 RPM for 5 days and the medium was sabouraud dextrose broth (pH 5.6). The red, green and blue were used for the LED and dark culture and fluorescent lamp were used as the control. This results, *C. militaris* showed the highest mycelial weight when green light was irradiated on the other hand, when irradiated with blue light, the content of cordycepin is about 4 times higher than that of fluorescent lamp in the cultures of *C. militaris*. In addition, the highest content of cordycepin was observed when irradiated for 6 h/day for 3 days. Interestingly, mycelial weight and cordycepin content were inversely related. The information obtained is considered fundamental and useful to the development of *C. militaris* cultivation process for efficient production of cordycepin on a large scale.

Recent Publications

1. Yang T, Guo M, Yang H, Gue S and Dong C (2016) The blue-light receptor CnWC-1 mediates fruit body development and secondary metabolism in *Cordyceps militaris*. Applied microbiology and biotechnology 100:743-755.
2. Tuli H S, Sharma A K, Sandhu S S and Kashyap D (2013) Cordycepin: A bioactive metabolite with therapeutic potential. Life sciences 93:863-869.
3. Kang C, Wen T C, Kang J C, Meng Z B, Li G R and Hyde K D (2014) Optimization of large-scale culture conditions for the production of cordycepin with *Cordyceps militaris* by liquid static culture. The scientific world journal 510627:1-15.
4. Huang L, Li Q, Chen Y, Wang X and Zhou X (2009) Determination and analysis of cordycepin and adenosine in the products of *Cordyceps* spp. African Journal of Microbiology Research 3(12):957-961.
5. Shih I L, Tsai K and Hsieh C (2007) Effect of culture conditions on the mycelial growth and bioactive metabolite production in submerged culture of *Cordyceps militaris*. Biochemical Engineering Journal 33:193-201.

Biography

Si Young Ha is student and PhD candidate of Gyeongsang National University in South Korea. She had retained a keen interest in applied and various fields of biomass. In particular, she has been studying the chemistry of woody biomass and their efficacy in treatment of vitiligo or atopic for a long time. She also has experience in poster presentation in the symposium on biotechnology for fuels and chemicals (2016) and bioenergy conference (2017).

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