Media Composition Influences the Ability of *Ganoderma lucidum* Mycelium to Absorb Selenium

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Abstract: The aim of this research was to investigate the influence of media composition (potato dextrose medium and malt medium) on the ability of mycelium to absorb selenium from Na_2SeO_3. Selenium (Se) absorption and retention by mycelium was better on potato dextrose medium (PDM) compared to malt medium (MM), except at a Se concentration of 1.3 mg/l, where it was better in MM. Maximum Se concentrations in mycelium were obtained when 1.0 and 1.3 mg/l Se was added to PDM and MM, respectively.

Key words: *Ganoderma lucidum*, selenium, absorption, fungal mycelium, media composition

1 Introduction

Ganoderma lucidum is one of the most popular mushrooms in oriental medicine because of its antioxidant, antitumor and other beneficial effects to health. β-D-glucans of *G. lucidum* are the major compounds responsible for immunomodulating effects.[1]
Selenium (Se) plays an essential nutritional role in some animals and humans, because it is an integral component of several enzyme.[2] According to these roles, it can be concluded that Se is an antioxidant and antimutagenic agent that can prevent the malignant transformation of normal cells and the activation of oncogenes.[3]
The aim of this research was to investigate the influence of media composition (potato dextrose medium and malt medium) on the ability of mycelium to absorb selenium from a selected source of Se, Na_2SeO_3.

2 Materials and Methods

G. lucidum strain BFB 31 was originally isolated from a Serbian forest by the authors and stored in the mycological collection of the Institute of Botany, University of Belgrade.
Mycelia were cultured on two different media: potato-dextrose medium (PDM) and malt medium (MM). PDM contained: potato, 200 g/l, glucose, 20 g/l; MM contained: malt extract, 40 g/l. The pH of both media was adjusted to 6.0.
Selenium was used in the form of sodium selenite (Na_2SeO_3) at the following concentrations: 0.3 mg/l, 0.7 mg/l, 1 mg/l, and 1.3 mg/l. Three replicates for each medium and Se concentration were made, and medium without Se served as the control. The media were inoculated and incubated at room temperature (22 ±2°C), on a rotary shaker (180 rpm) for 28 days. After the cultivation period, mycelia was filtered and dried at 30°C during the night and prepared for Se extraction. Se concentration was measured using a graphite furnace Atomic Absorption Spectrometer (Varian, Australia).

3 Results and Discussion

Selenium absorption and retention by mycelium were better on PDM compared to MM, except at the Se con

centration of 1.3 mg/l, where it was better in MM (Table 1). Maximum levels of Se in mycelium were obtained when 1.0 and 1.3 mg/l Se was added to PDM and MM, respectively.

Table 1. Selenium concentrations in mycelia of *G. lucidum* grown on PDM and MM

Selenium concentrations in medium (mg/l)	Selenium concentrations in mycelia (µg/g)	
	PDM	MM
0.0	1.529	0
0.3	9.859	5.850
0.7	8.397	5.860
1.0	12.315	8.160
1.3	10.404	13.580

Discussion of the results obtained is rather difficult because our knowledge of Se metabolism in fungi is limited. The only investigations concerning Se metabolism in fungi have been done with yeasts.[2, 4] Previous studies with *Pleurotus ostreatus* has shown that the capacity for Se absorption by mycelia depends upon the culture medium.[5] The results obtained for *P. ostreatus* were similar to the results obtained in the present study; i.e. Se concentrations were significantly higher in mycelia grown on potato-dextrose Se-enriched medium with Na_2SeO_3 than in malt medium.

References

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