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Title: Patterns of major metabolites biosynthesis by different mushroom fungi grown on glucose-based submerged cultures

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Source: BIOPROCESS AND BIOSYSTEMS ENGINEERING **Volume:** 37 **Issue:** 7 **Pages:** 1385-1400 **DOI:** 10.1007/s00449-013-1112-2 **Published:** JUL 2014

Times Cited in Web of Science Core Collection: 8

Total Times Cited: 8

Usage Count (Last 180 days): 3

Usage Count (Since 2013): 38

Cited Reference Count: 59

Abstract: The biosynthetic potential of four basidiomycetes (Agrocybe aegerita, Flammulina velutipes, Ganoderma applanatum and Pleurotus pulmonarius) and one ascomycete (Morchella esculenta) was examined in regard to biomass, intracellular (endopolysaccharides and lipids) and extracellular (exopolysaccharides) compounds' production in liquid media with glucose as substrate, in static and agitated cultures. Exopolysaccharides' production presented significant negative correlation with biomass, endopolysaccharides and lipids, while biomass was positively related to the production of endopolysaccharides and lipids. Maximum values of biomass, endo- and exo-polysaccharides obtained were quite impressive: P. pulmonarius produced 22.5 g/L of biomass, A. aegerita 60.4 % (w/w) of endopolysaccharides and F. velutipes 1.2 g/L of exopolysaccharides. Polysaccharides and lipids synthesized at the early growth stages were subjected to degradation as the fermentation proceeded. Mycelial lipids of all strains were highly unsaturated, dominated by linoleic acid, whereas glucose was the main building block of endopolysaccharides. The ability of the examined mushroom fungi to synthesize in high quantities biomass and polysaccharides, products with biotechnological and medicinal interest, renders these fungi as potential candidates in sugar-based bio-refineries.

Accession Number: WOS:000338237700017

PubMed ID: 24366161

Language: English

Document Type: Article

Author Keywords: Agrocybe aegerita; Flammulina velutipes; Ganoderma applanatum; Morchella esculenta; Pleurotus pulmonarius; Biomass; Lipids; Polysaccharides; Agitation; Static

KeyWords Plus: VALUABLE BIOACTIVE METABOLITES; PLEUROTUS-SAJOR-CAJU; GANODERMA-LUCIDUM; VOLVARIELLA-VOLVACEA; MORCHELLA-ESCULENTA; POLYSACCHARIDES PRODUCTION; INOCULATION DENSITY; MEDICINAL MUSHROOMS; AGARICUS-BISPORUS; MYCELIAL BIOMASS

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Publisher: SPRINGER

Publisher Address: 233 SPRING ST, NEW YORK, NY 10013 USA

Web of Science Categories: Biotechnology & Applied Microbiology; Engineering, Chemical

Research Areas: Biotechnology & Applied Microbiology; Engineering

IDS Number: AK2GS

ISSN: 1615-7591

eISSN: 1615-7605

29-char Source Abbrev.: BIOPROC BIOSYST ENG

ISO Source Abbrev.: Bioprocess. Biosyst. Eng.

Source Item Page Count: 16

Open Access: No

Output Date: 2017-08-01

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