Fermentation Technology
ISSN: 2167-7972

Camassola, Ferment Technol 2013, 2:1
DOI: 10.4172/2167-7972.1000e117

Editorial Open Access

Mushrooms – The Incredible Factory for Enzymes and Metabolites Productions

Marli Camassola*

University of Caxias do Sul, Institute of Biotechnology, Brazil

Mushrooms are fungi belonging to the higher phyla Ascomycota and Basidiomycota. In fact the name mushroom refers to a fruiting body, formed by several hyphae that grow upwards and produces spores (basidiospores). These spores are invisible to the naked eye and spread with the wind, with water or even attached to the body of animals. The fruiting fungus is the structure of sexual reproduction and has different shapes and colors.

Mushrooms are unable to synthesize organic matter and are devoid of chlorophyll, which prevent them from performing photosynthesis. So are called heterotrophic beings, i.e., having no ability to produce their own food. Like all fungi, mushrooms feed by absorption. Has a number of filaments of cells, called hyphae, which may be branched and have varying lengths. The assembly of hyphal is the mycelia, which plays important roles as support and absorption of nutrients.

The fungi reproduce through spores. A spore is basically a cell surrounded by a protective coating (cell wall), from which one can develop a new organism. After the merger of compatible hyphae, the mycelium produced can develop lightly. Factors such as temperature and humidity provide adequate conditions for mycelia give rise to mushrooms, which produce spores.

Fungi depend on other living beings for food. When it feeds on dead organic matter are called decomposing fungi (saprophytes). The parasitic fungi feed on living things such as insects, plants and even other mushrooms.

It is already established in the literature that some species of macro fungi, particularly mushrooms, represent a potential source of biologically active compounds as immunomodulators, antioxidants, anti-inflammatory, antibacterial, antifungal, antiviral, hepatic protection, reduce glucose and lipidic levels and have antitumor activities [1,2]. There are also reports that many species have high nutritional value with high protein and fiber [3]. In the cosmetics industry, various substances extracted from macromicetos have been used, such as ceramides, lentinan, schizophyllan, and L-ergotionin fatty acids omega 3, 6 and 9, carotenoids, resveratrol, azelaic acid among others [4]. In addition, some mushroom species are producers of enzymes. Among these enzymes are hydrolases [5], esterases [6] and phenol oxidases [7,8] among others. It is also important to note that the mushroom laccases have been studied because they have the potential to inhibit HIV reverse transcriptase [9] and antitumor effect [10]. Okamoto et al. [11] observed that the mushroom *Neolentinuslepideus* is capable of fermenting xylose to ethanol.

These data indicate the importance of development of bioprocesses using mushrooms as bio-factories for the production of enzymes and metabolites of high value to humans and the environment.

References

1. Novaes MRCG, Valadares F, Reis MC, GonçalvesDR, Menezes MC (2011) The effects of dietary supplementation with Agaricales mushrooms and other medicinal fungi on breast cancer: Evidence-based medicine. Clinics 66: 2133-2139.
2. Petrova RD (2012) New scientific approaches to cancer treatment: can medicinal mushrooms defeat the curse of the century? Int J Med Mushrooms 14: 1-20.
3. Reis FS, Barros L, Martins A, Ferreira IC (2012) Chemical composition and nutritional value of the most widely appreciated cultivated mushrooms: an inter-species comparative study. Food Chem Toxicol 50: 191-197.
4. Hyde KD, Bahkali AH, Moslem MA (2010) Fungi—an unusual source for cosmetics.Fungal Divers 43: 1-9.
5. Arboleda VJW, Valencia JA, Gonçalves de SF, Dussan MK, Restrepo FGM, et al. (2011) Holocellulase activity from Schizophyllum commune grown on bamboo: a comparison with different substrates. Curr Microbiol 63: 581-587.
6. Hashimoto K, Kaneko S, Yoshida M (2010) Extracellular carbohydrate esterase from the basidiomycete Coprinopsis cinerea released ferulic and acetic acids from xylan. Biosci Biotechnol Biochem 74: 1722-1724.
7. Cohen R, Persky L, Hadar Y (2002) Biotechnological applications and potential of wood-degrading mushrooms of the genus Pleurotus. Appl Microbiol Biotechnol 58: 582-594.
8. Stajia M, Vukojevi AJ, Duletia LAS (2009) Biology of Pleurotus eryngii and role in biotechnological processes: a review. Crit Rev Biotechnol 29: 55-66.
9. Zhang GQ, Tian T, Liu YP, Wang HX, Chen QJ (2011) Alaccase with anti-proliferative activity against tumor cells from a white root fungus Abortiporusbiennis. Process Biochem 46: 2336-2340.
10. Hu DD, Zhang RY, Zhang GQ, Wang HX, Ng TB (2011) A laccase with antiproliferative activity against tumor cells from an edible mushroom, white common Agrocybe cylindracea. Phytomedicine 18: 374-379.
11. Okamoto K, Kanawaku R, Masumoto M, Yanase H (2012) Efficient xylose fermentation by the brown rot fungus Neolentinus lepideus. Enzyme Microb Technol 50: 96-100.

***Corresponding author:** Marli Camassola, Laboratory of Enzymes and Biomass, Brazil, Tel: 55 54 3218 2100; Fax: 55 54 3218 2149; E-mail: mcamassola@gmail.com

Received September 11, 2013; **Accepted** September 13, 2013; **Published** September 16, 2013

Citation: Camassola M (2013) Mushrooms–The Incredible Factory for Enzymes and Metabolites Productions. Ferment Technol 2: e117. doi:10.4172/2167-7972.1000e117