

## INVESTICE DO ROZVOJE VZDĚLÁVÁNÍ

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Klíčová slova: fungi, mold, mycotoxins

Metodický list/anotace:

Materiál slouží k seznámení se základní odbornou slovní zásobou pro studenty oborů Aplikovaná chemie. Jedná se zejména o termíny z oblasti biologie a chemie.

Studenti odhadují na základě svých znalostí význam slov. V případě potřeby pracují se slovníkem. Důležité je pochopení obsahu a aktivní slovní zásoba. Studenti využívají svých znalostí z oborů chemie, biologie a mikrobiologie.

Připraví krátkou prezentaci se zajímavými informacemi.

Fungi

# Fungi

- A fungus is a member of a large group of eukaryotic organisms that includes microorganisms such as yeasts and moulds as well as mushrooms. These organisms are classified as a kingdom, Fungi, which is separate from plants, animals and bacteria. One major difference is that fungal cells have cell walls that contain chitin, unlike the cell walls of plants which contain cellulose, and unlike the cell walls of bacteria. The discipline of biology devoted to the study of fungi is known as mycology. Mycology has often been regarded as a branch of botany, even though it is a separate kingdom in biological taxonomy. Genetic studies have shown that fungi are more closely related to animals than to plants.

# Diversity

- Fungi have a worldwide distribution, and grow in a wide range of habitats, including extreme environments such as deserts or areas with high salt concentrations. Some can survive the intense UV and cosmic radiation. Most grow in terrestrial environments.
- Around 100,000 species of fungi have been formally described by taxonomists.
- Because of similarities in morphology and lifestyle, the slime molds (myxomycetes) and water molds (oomycetes) were formerly classified in the kingdom Fungi. Unlike true fungi the cell walls of these organisms contain cellulose and lack chitin. Myxomycetes are like fungi, but are grouped in the Amoebozoa.

# Armillaria ostoyae - pic.1



# Mold – pic.2

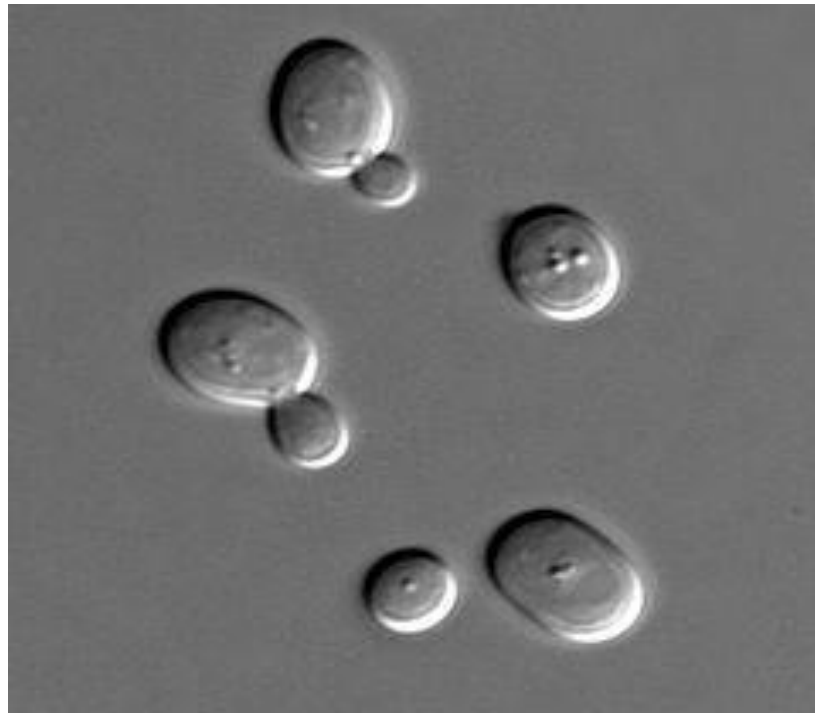
- A mould is a fungus that grows in the form of multicellular filaments called hyphae



# Yeast

- By fermentation, the yeast species *Saccharomyces cerevisiae* converts carbohydrates to carbon dioxide and alcohols – for thousands of years the carbon dioxide has been used in baking and the alcohol in alcoholic beverages.
- Other species of yeasts, such as *Candida albicans*, are opportunistic pathogens and can cause infections in humans.

# Yeast – pic.3





# Pharmaceuticals from molds

- Alexander Fleming's accidental discovery of the antibiotic penicillin involved the mold *Penicillium*
- Several of the statin cholesterol-lowering drugs (such as Lovastatin, from *Aspergillus terreus*) are derived from molds.
- Howard Florey, Ernst Chain, Norman Heatley, Edward Abraham and teams of scientists in the UK and USA developed industrial-scale production of penicillin between 1941–45 and arguably started the use of antibiotics in medicine.
- The immunosuppressant drug cyclosporine, used to suppress the rejection of transplanted organs, is derived from the mold *Tolypocladium inflatum*.

# Mycotoxins

- A mycotoxin is a toxic secondary metabolite produced by organisms of the fungi kingdom, commonly known as molds. The term 'mycotoxin' is usually reserved for the toxic chemical products produced by fungi that readily colonize crops. One mold species may produce many different mycotoxins, and the same mycotoxin may be produced by several species.
- In 2004 in Kenya, 125 people died and nearly 200 others were treated after eating aflatoxin-contaminated maize. The deaths were mainly associated with homegrown maize that had not been treated with fungicides or properly dried before storage.

# Zdroje

- pic.1 -ROCKEFELLER, Allan. en.wikipedia.org [online]. [cit. 13.09.2013]. Dostupný na WWW:  
[http://en.wikipedia.org/wiki/File:Armillaria\\_ostoyae\\_MO.jpg](http://en.wikipedia.org/wiki/File:Armillaria_ostoyae_MO.jpg)
- pic.2 - NOTFROMUTRECHT, Allan. en.wikipedia.org [online]. [cit. 13.09.2013]. Dostupný na WWW:  
[http://en.wikipedia.org/wiki/File:Mouldy\\_Clementine.jpg](http://en.wikipedia.org/wiki/File:Mouldy_Clementine.jpg)
- pic.3 - MASUR. en.wikipedia.org [online]. [cit. 13.09.2013]. Dostupný na WWW:  
[http://en.wikipedia.org/wiki/File:S\\_cerevisiae\\_under\\_DIC\\_microscopy.jpg](http://en.wikipedia.org/wiki/File:S_cerevisiae_under_DIC_microscopy.jpg)

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