Collection of Microscopic Fungi of the Institute of Soil Biology BC AS CR

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History

The Collection of Microscopic Fungi of the Institute of Soil Biology of the Biology Centre AS CR, v. v. i. (CMF ISB) was established by Dr. Alena Nováková in 1980. In 1993, the CMF ISB was included in the Federation of Czech and Slovak Collections of Microorganisms (FCCM). The presenting author was appointed a current curator of the CMF ISB in XII/2013.

Current status

CMF ISB has been focused on microscopic, predominantly filamentous fungi. Nowadays, the CMF ISB consists of about 2000 strains of micromycetes isolated mainly from soils of the Czech Republic, Slovakia, Germany, Russia, U.S.A., and Macedonia, then isolated from air, litter, caves (Czech Republic, Slovakia, Romania, Spain, France), intestine and excrements of soil invertebrates, vermicomposts, etc.

The strains are maintained in tubes on slope agar media in refrigerator at 4 °C. Some strains are maintained in alginate pellets at 4 °C as well. For long-term storage of strains several other techniques (e.g. glycerol or water stocks) will be implemented during 2014.

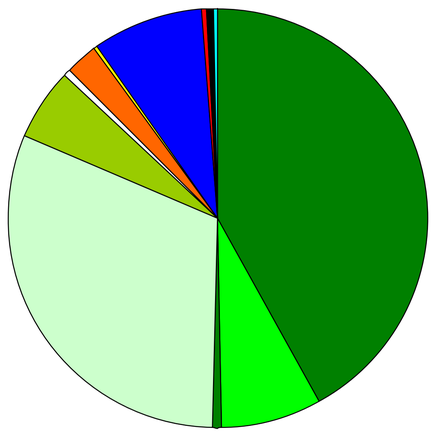


Fig. 1. Ratio of higher taxons of fungal isolates deposited in CMF ISB.

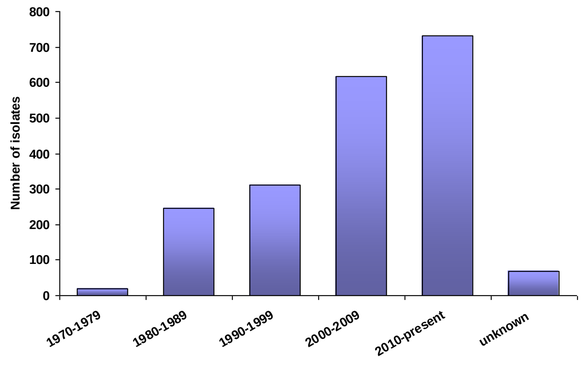


Fig. 2. Year of isolation (age of maintained strains).

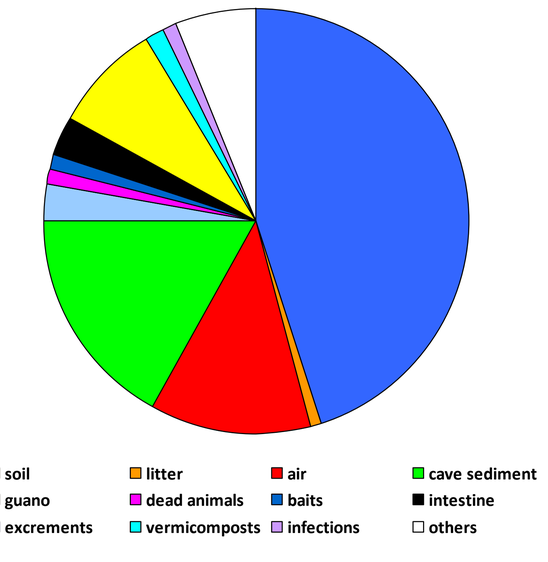
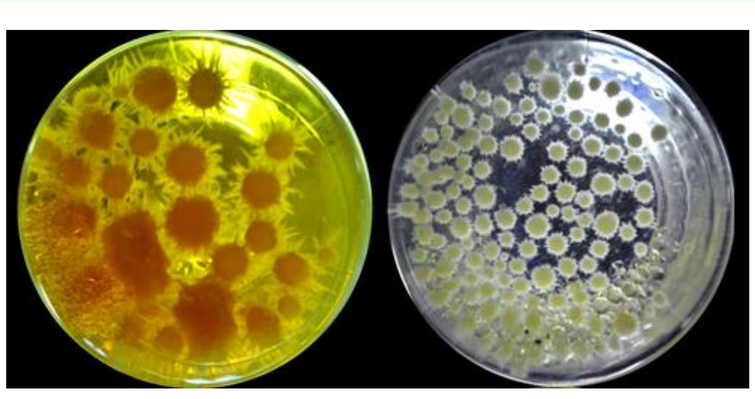


Fig. 3. Ratio of main sampling environment




Biotechnological potential of specimens deposited in CMF ISB

The CMF ISB harbours some isolates not deposited in any culture collections and can serve as a source of unknown metabolites or more effective strains.

Basic research, phylogeny

Deposited isolates are used for a number of basic as well as applied research topics (metabolic pathways, phylogeny analyses and evolution, production of secondary metabolites, green-house gases production, organic matter trans-formation, etc.).

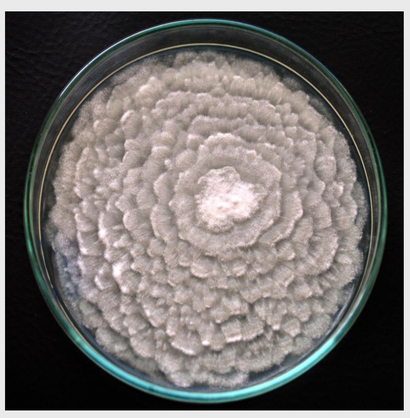
Strains are also used for teaching at the universities as well as for science popularizing projects, e.g. Open days in the ISB BC AS CR, v.v.i.

Bioremediation, biocontrol

Soil fungi can be successfuly used in bioremediation to remove nonionic surfactants, degrade insecticides, herbicides, heavy fuels, coal tars or creosotel. They turn these substances into carbon dioxide, water, and basic elements.

Interactions of fungi with other organisms can be used for biocontrol against insects, mites, other fungi, weeds, nematodes or herbivores.

Applied research for food, textile or pharmaceutical industry



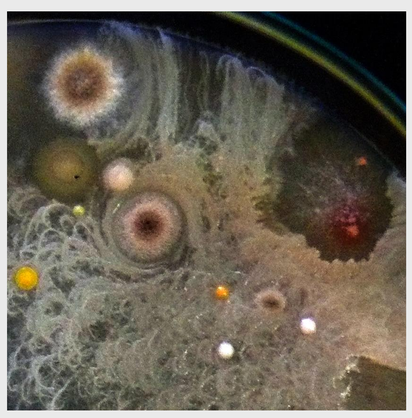
Soil fungi are often used in food industry (cheese, alcohol, syrupe, fermentation products, organic acids).

Microsopic fungi serve as a renewable source of substances usable in food or health-lifestyle industry (omega-3 and omega-6 fatty acids).

The major advantages of microbes as sources are their fast multiplication, variable growing substrates and relatively small space requirements.

Several fungi can produce water soluble colorants. These dyes and pigments can be used in different branches of industry, e.g. food, textile, paper, etc.

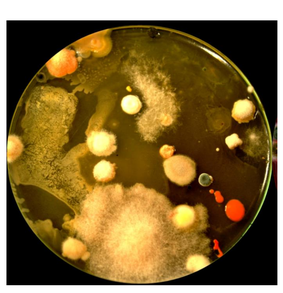
Wasteful use of carcinogenic or hazardous colorants in the industry has resulted in a growing demand for stable eco-friendly or non-toxic colorants from natural resources.



Fungi produce a variety of biologically active compounds (enzymes, steroids, antibiotics).

Fungal enzymes are used in diverse practices, e.g. food processing, paper production, brewing, fruit and jam manufacturing, biofuel generation, or composting.

Fungi are a valuable source of antibiotic compounds, eg. penicillins, cephalosporines, statin, etc.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