



COLLECTIONS OF MYCOLOGY AND ALGOLOGY DEPARTMENT OF MOSCOW LOMONOSOV STATE UNIVERSITY



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The Department of Mycology and Algology of Moscow University was organized in the first quarter of the twentieth century, preparing highly qualified specialists in these sciences. It is one of the leading centers in Russia for the study of systematics, ecology, physiology, biochemistry and genetics of fungi, fungi-like organisms and algae, and their use in biotechnology. Creation and maintenance of fungal collections is given great attention and remain a priority for the staff. Numerous expeditions around Russia and other countries were carried out to study of fungal ecology and geography.

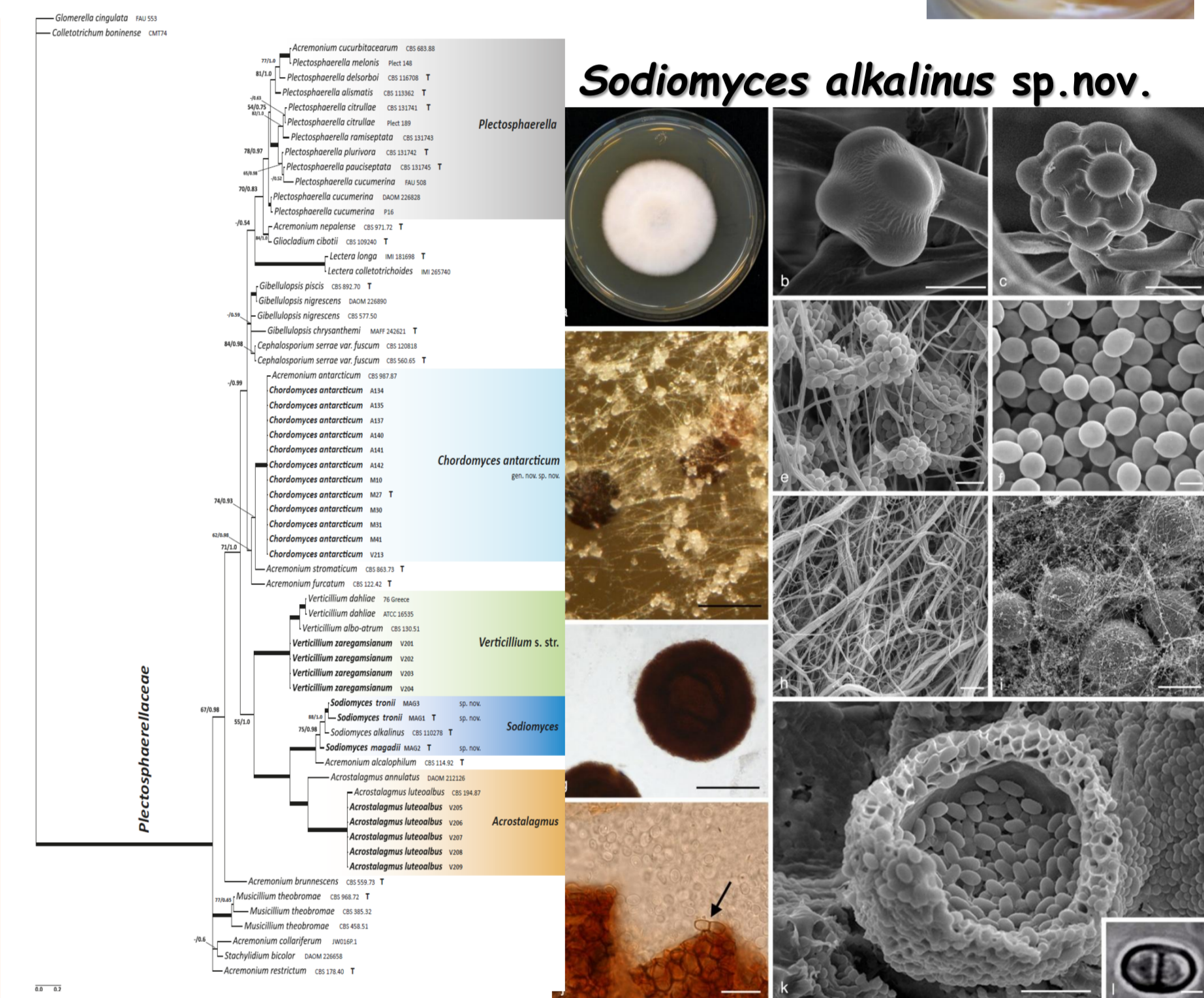


As a result the collections of different taxonomic and ecological groups of pure cultures fungi were established. The expansion of these work now is based on the following criteria – by adding the strains with unique properties, rare and new species, isolates of widely distributed species that are needed for population and phylogeographic studies, and strains of interest to biotechnologies.

The collection of soil microscopic fungi (MSU_FS, curator: Alexandrova A.V.) includes 1840 cryosaved strains (-70-80 °C,) belonging to 527 species, 185 genera, 58 families, 27 orders, 11 classes, 4 phylum Cultures were isolated from soils and the connected substrates, mainly, from protected territories (natural reserves) of the European part of Russia, Siberia, Mongolia, Vietnam. For the last 6 years from soil and litter of tropical forests of Vietnam, were isolated 6 new species – *Craspedodidymum seifertii* Melnik, A. V. Alexandrova & U. Braun, *Dactylaria mucoglobifera* Melnik, U. Braun & A. V. Alexandrova, *Entoloma flavovelutinum* O. V. Morozova, E. S. Popov, A. V. Alexandrova & Xiao Lan He, *Ityorhoptrum biseptatum* Melnik, A. V. Alexandrova & U. Braun, *Kiliophora novozhilovii* Melnik, U. Braun & A. V. Alexandrova, *Pyricularia contorta* Melnik, U. Braun & A. V. Alexandrova were introduced in the collection.



The collection of extremophilic micromycetes (FEC, curators E.N.Bilanenko, M.L.Georgieva, A.V.Kurakov) includes 150 cryosaved cultures of alkalophilic, alkalotolerant, halotolerant, acidophilic, acidotolerant, psychrotolerant, facultatively anaerobic fungi and 250 strains saved on slants with nutrients medium. All cultures were identified to the species level on the basis of cultural-morphological and molecular genetic methods. Majority of them were isolated from alkaline, saline ecotopes of the European part, Siberia, Mongolia, Kazakhstan, Armenia, Tanzania, and in recent years - from sea sediments and raised bogs. New taxa of alkaliphilic and alkalotolerant fungi were discovered: 2 genera – *Sodiomyces* A. A. Grum-Grzhim. et al., *Chordomyces* Bilanenko, Georgieva & A. A. Grum - Grzhim; 8 species – *Sodiomyces alkalinus* (Bilanenko & M. Ivanova) A. A. Grum-Grzhim., A. J. M. Debets & Bilanenko, *S. magadii* S. A. Bondarenko, A. A. Grum-Grzhim., A. J. M. Debets & Bilanenko, *S. tronii* S. A. Bondarenko, A. A. Grum-Grzhim., A. J. M. Debets & Bilanenko, *Emericellopsis alkaline* Bilanenko & Georgieva, *Chordomyces antarcticum* Bilanenko, Georgieva & A. Grum-Grzhim, *Alternaria kulundii* Bilanenko, Georgieva & A. Grum - Grzhim, *A. petuchovskii* Bilanenko, Georgieva & A. A. Grum-Grzhim, *A. shukurtuzii* Bilanenko, Georgieva & A. A. Grum-Grzhim; section - *Alternaria* sect. *Soda* Bilanenko, Georgieva & A. A. Grum-Grzhim.

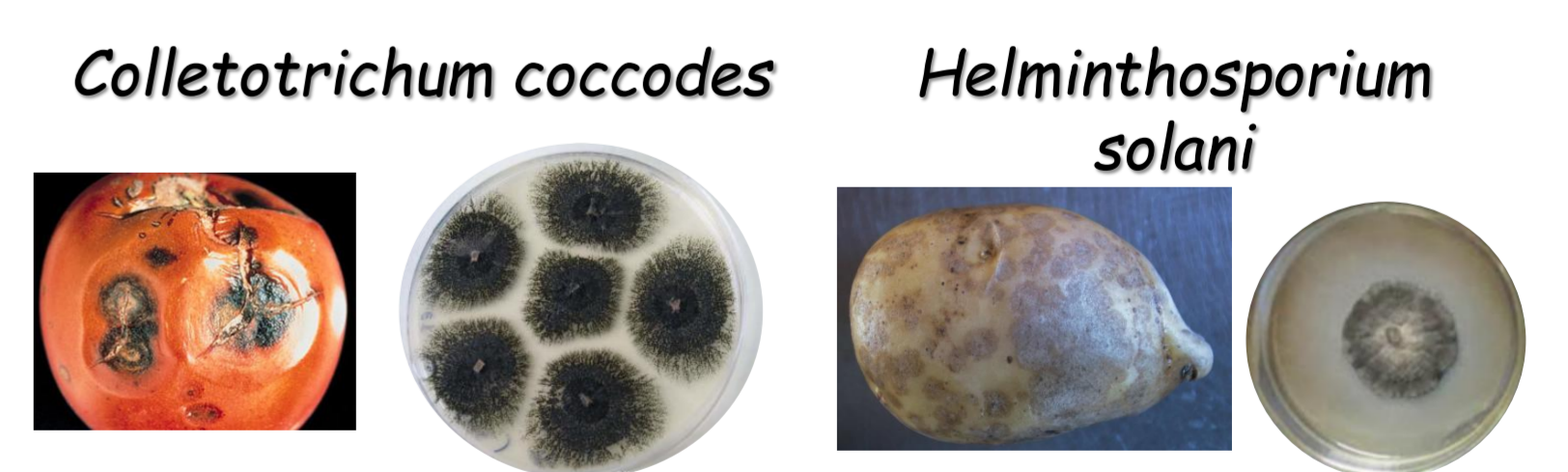


Diversity, phylogeny, mechanisms of adaptation of fungi-extremophiles are studied. The phenomenon of obligate fungal alkalophile was discovered. The range of proteases secreted by them in alkaline conditions, changes in cytosol and composition of the cytoplasmic membrane were characterized. Phylogenetic analysis showed that alkaliphilic fungi polyphyletic group of ascomycetous affinity.

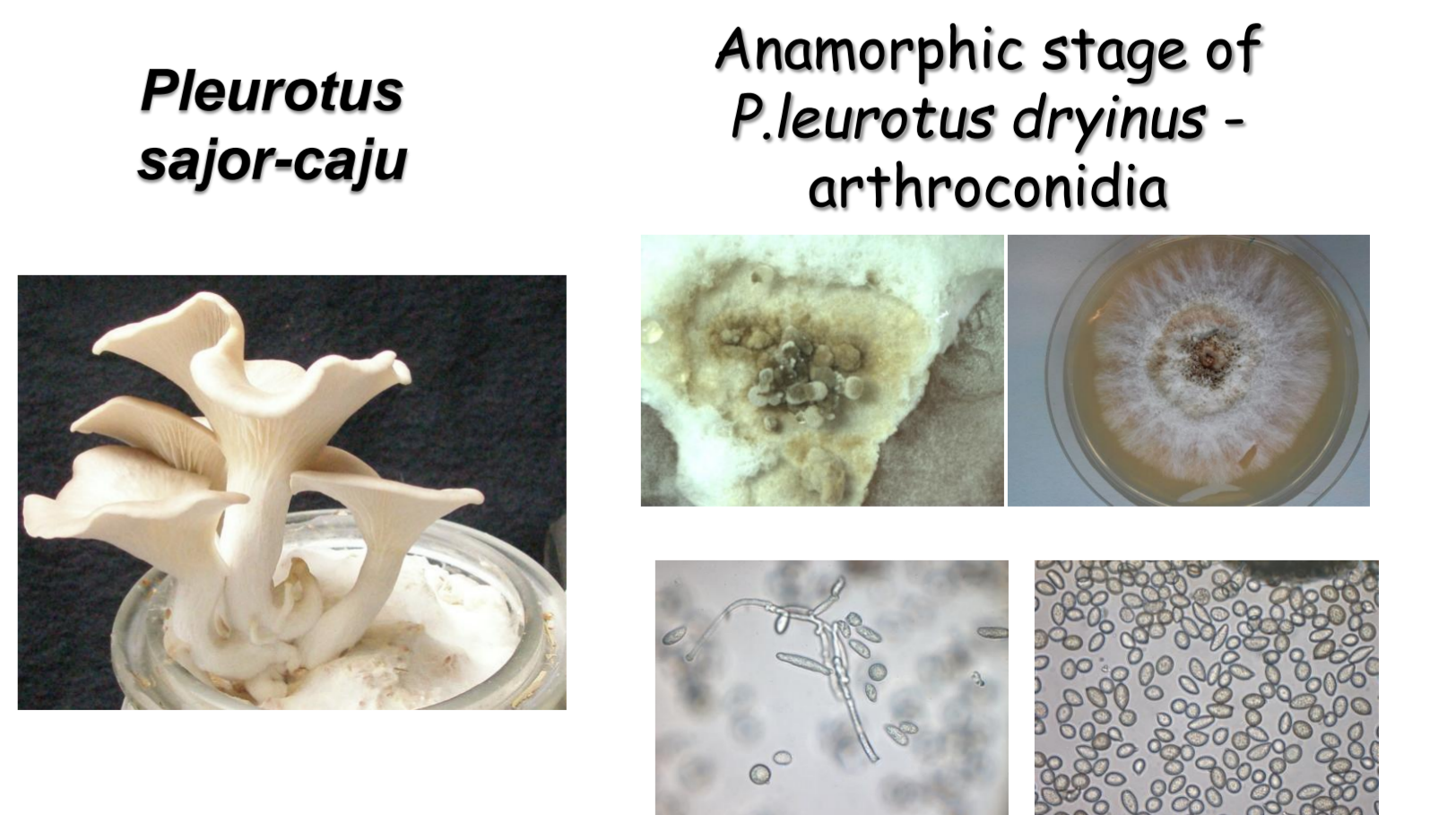
Collection of ectomycorrhizal fungi and endophytes of cereals grasses are represented by several tens of strains of *Claviceps* species. (Voronina E.Yu., Blagoveshenskaya E.Yu.)

The collection of fungi-pathogens of solanaceous plants (MSU_PPO solanumfungi, curators Kokaeva L.Yu., Elanskii S.N.) contains 910 strains of 6 fungal species (*Colletotrichum coccodes* (Wallr.) S. Hughes, *Helminthosporium solani* Durieu & Mont., *Alternaria solani* Sorauer, *Thanatephorus cucumeris* (A. B. Frank) Donk., *Fusarium solani* (Mart.) Sacc.) and one species of oomycetes *Phytophthora infestans* (Mont.) de Bary). They are isolated from the infected by pathogens potato, tomato and wild solanaceous plants collected in Moscow, Kostroma, Leningrad regions, Tatarstan republik, Stavropol and Krasnodar province, from tubers of seed potatoes imported to Russia from Holland and Germany. The strains are. Study the intraspecific diversity, development of test systems for rapid diagnosis of pathogens, assessments of resistance to new varieties of potatoes and tomato and the effectiveness of fungicides.

The Department has fungal strains for bio-resistance testing of synthetic polymers, lubricants, leathers and other materials according to state standards (V.L.Mokeeva).



Collections of wild and cultivated macromycetes (MSU_FM) and (MGUPI) includes 102 cryosaved strains and edible and for biotechnology basidiomycetes (MSU-BIO-EBF) has 310 strains (curators: A.V. Shnyreva, M.Yu.Djgov, O.V.Voronko, L.V.Garibova, A.V.Kurakov, I.A.Viner). Both of them preserve more than 40 genera - *Pleurotus* - 10 species, *Flammulina velutipes* (Curtis) Singer, *Kuehneromyces mutabilis* (Schaeff.) Singer & A. H. Sm., *Hericium coralloides* (Scop.) Pers. and many others. Majority of the strains were isolated from fruiting bodies in temperate zone of forests European Russia, some strains are originated from Siberia, Finland, France, Germany, Czechia, Armenia, and Mexico, most of them have ITS GenBank accession #.



The collections are used in the educational process, search for producers of antibiotics, enzymes and other metabolites, for the development of cryopreservation of cultures and various studies of fungi. In our collections there are strains inhibiting of phytopathogens, effectively oxidizing of oil hydrocarbon, capable to synthesis of antibiotics (peptaibols), transformate steroids, produce alkalistable proteases, cyclosporines. We are open for collaborative researches and mutually beneficial exchange of strains.