

# **WDCM training course summary report from Nadezhda Psurtseva, Komarov Botanical Institute of the Russian Academy of Sciences, Russia**

## **Personal introduction**

I am Dr. Nadezhda Psurtseva, Ph.D (1988), the Head of the Laboratory of Fungal Biochemistry of the Komarov Botanical Institute RAS, and the Head Curator of the LE-BIN Culture Collection. My research interests are conservation *ex situ* of Agaricomycetes from different taxonomic and ecologic groups and investigation of morphology, physiology and biochemistry of mushroom cultures for scientific and practical purposes, including screening for biological activity (i.e. oxidative potential, antifungal and antiviral activities). I have an experience in isolation of di- and monokaryon cultures, mating study, fruiting of basidiomycetes in culture, conservation and maintaining of fungal cultures in culture collection.

## ***Name of your culture collection***

*Komarov Botanical Institute Basidiomycetes Culture Collection of the  
Russian Academy of Sciences (LE-BIN 1015)*

## **ABSTRACT**

Komarov Botanical Institute Basidiomycetes Culture Collection (LE-BIN 1015) is the largest in Russia specialized culture collection preserving 10% of natural mushroom diversity in the country. It maintains over 2600 strains of about 650 species of mushrooms. The collection grows actively increasing the strain's variety and taxonomic diversity of preserving species. WDCM training course gave a good opportunity to enrich our knowledge in modern trends of information management and utilizations of microbial resources; it provided lectures and practice on vital problems in preservation and characterization of microorganisms with emphasizing on bioinformatics. The participation in the WDCM training course will promote the further development of the LE-BIN collection database. Further cooperation with the WDCM would be very much desirable.

### **Key words:**

**Basidiomycetes strains, culture collection, preservation methods, database, GCM catalog**

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## **1. Brief introduction of your Culture Collection**

Komarov Botanical Institute Basidiomycetes Culture Collection (LE-BIN 1015) preserves and maintains dikaryon strains of basidial macromycetes from various taxonomic and ecologic groups originating from different geographical regions. It is an integral part of the Laboratory of Fungal Biochemistry. The Collection was established in the late 1950s for study of biologically active compounds and enzymes in basidiomycetes. In the late 1990s, a new project based on the idea of macromycete conservation *ex situ* started in the Collection. A plan of the Collection's development was altered to include conservation *ex situ* of taxonomical and ecological diversity of basidiomycetes in Russia with emphases on preserving rare and endangered species, maintaining ectomycorrhizal fungi, and culturing species strains useful for biotechnology and medicine. Most of the Collection strains are original isolates from field works in various regions of Russia (European areas, the Caucasus, Urals, Siberia, and Far East) mainly in protected zones, i.e. nature reserves and national parks, but there are many strains from

territories of the former USSR and some other countries. Original specimens are identified by taxonomist specialists in various groups of macromycetes. Voucher specimens for maintaining cultures are preserved in the Mycological Herbarium of the Komarov Botanical Institute (LE). Cultures maintained in the Collection are mainly of saprotrophic mushrooms including xylotrophs, litter decomposers, soil saprotrophs, and fungi growing in nature on various other substrata. Some ectomycorrhizal fungi (e.g. species of *Amanita*, *Boletus*, and *Suillus*) are also maintained in the collection. In 2007 was published 2<sup>nd</sup> issue of the LE-BIN Catalog (Psurtsseva N.V., Kiyashko A.A., Gachkova E.Y., Belova N.V. Basidiomycetes Culture Collection LE (BIN): Catalogue of Strains. M., SPb: KMK Scientific Press Ltd. 2007. 116 p.) containing information about 1463 strains of agaricoid, aphylophoroid and gasteroid fungi of over 500 species from 200 genera, 55 families and 24 orders listed in alphabetic order. A list of 14 ascomycetes strains maintained in the LE-BIN is given in the Appendix.

In 2012 the LE-BIN registered in the WDCM under #1015. Nowadays LE–BIN is the largest culture collection of Agaricomycetes in Russia, preserving approximately 10 % of the natural diversity of mushrooms in Russia. The collection gradually increases. It preserves now over 2600 strains of about 650 species from 203 genera, 53 families and 14 orders of mushrooms ordered according to the system set out in

the 9th edition of Ainsworth and Bisby's Dictionary of the Fungi (Kirk et al. 2001). Names of the LE-BIN cultures are regularly updated following *Index Fungorum*.

The strains are maintained using 3 preservation methods: as sub-cultures in tubes on beer-ale agar slants at 4–6 °C; in screw-cap vials under distilled water at room temperature or at 4-6 °C (the method was started from 2000); by cryopreservation (mechanical deep-freeze) in cryovials at -80 °C (the method was started from 2011). By now 100% of the collection strains are maintained by sub-culture method, about 75% - under distilled water, and about 25% by cryopreservation.

The LE-BIN has joined the GCM and transferred there an information about 1363 strains while nowadays the total number of strains preserved in the collection is 2615 including strains obtained in 2015 field works.

Our plan for future is developing of the LE-BIN collection by (1) increasing the species and strains diversity of preserved fungi, (2) maintaining all strains by 3 methods including sub-culturing, preservation under distilled water, and cryopreservation at -80 °C, and (3) developing of the LE-BIN information system including documents, database for all strains, taxonomy revision, website.

## **2. Benefit from the training courses**

The WDCM Training Course was a great opportunity for me to learn about last achievements in microbial resources information management

and utilization. I am very grateful to the WDCM and the Training Course organizers for the invitation and financial support. It is very important for any culture collection to follow the international standards in the collection management. The lecturers and the practice leaders of the Training Course provided us with valuable information on microbial culture collections in the world and in China, technical advancement in microbiology and mycology, microbial resource databases and other trends in modern science including genetic and molecular techniques and genome analysis. We were introduced to the WFCC, WDCM, and the Global Catalogue of Microorganisms and practically learned how to operate with the databases. The practice helped me to operate with the LE-BIN information in the GCM and create the LE-BIN webpage on the GCM website. The other important thing was visiting of the CGMCC and Beijing Institute of Genomics of the Chinese Academy of Sciences.

During the Course we had a wonderful, pleasant and productive communication within the group of 15 participants from 11 countries. We became good friends and shared not only the classes, but also the weekends exploring the places of interest, shopping and food in Beijing. During three weeks in Beijing including the first week of participating in the WDCM 50<sup>th</sup> Anniversary, it appeared to be more days off than we expected including besides four weekends one Chinese holiday. We spent them visiting the Great Wall, Forbidden City, Summer Place, the Zoo, and

various temples and walking places. It was a wonderful time in Beijing.

### **3. Suggestion on WDCM work**

The LE-BIN collection joined the WDCM in 2012, but we new about this database much earlier and used the information from WDCM regarding world culture collections in our work. We are grateful to Dr. Ma and Dr. Linhuan for maintaining, managing and developing the WDCM project.

### **4. Comments or suggestion on the training courses**

The Training Course was organized as everyday classes with lectures and practice hours. I am grateful to Ms. Jianyuan Zhang and Ms. Qi Heyuan for organizing all things and taking care for the students. The Best Western Olympic Stadium Hotel was a good choice for our accommodations; it is located not far from the Institute of Microbiology, and took us for about 20 min of walking to get to the institute. I appreciate all lecturers who gave their presentations. The majority of them were interesting and informative. I am not an expert in bioinformatics and these lectures were very useful for me. Unfortunately, the Internet connection was not stable in the classroom during the classes; therefore we could not get appropriate practice on the topics titled in the program. Most of the time we spent in the class and only 2 visits were planned in the Program – to CGMCC and to Beijing Institute of Genomics. The visit to the CGMCC was very short – we saw just a

storage room of lyophilized collection and a room with liquid nitrogen tanks. It would be interesting to see more details of the collection management. My suggestions on the training course are the following:

1. To provide a stable Internet connection in the classroom.
2. To shorten coffee break and lunch time. Coffee breaks were 30 min and it was wasting of time. The lunch time was 2 hours and it was more than enough to take a meal in the student cafeteria. I would suggest 15 min for coffee breaks and 1 h for lunches. This would save for about 1.5 h of light day for an after class activity – working on report and visiting places of interest in Beijing.
3. To plan in the program more time for practicing.
4. To include in the program more visits to the scientific laboratories and Equipment Centers of CAS for the introduction to the institute's facilities would be more clear and visualized.
5. It would be useful if the organizers provided some information about best places for visiting in Beijing where we could experience the Chinese culture after the end of classes and during the weekends: places of interests, restaurants, shopping places.

## **5. Suggestion on further cooperation between WDCM and your collections.**

It would be useful for our collection to join one of the international

projects coordinated by WDCM. LE-BIN culture collection is mainly a research collection on the base of the research laboratory. The collection does not have direct financial support from the host organization (Komarov Botanical Institute) as well as from the Academy of Sciences or any other government or private funds and organizations. All work on the collection maintaining, including collection records and information managements, lies on the shoulders of several laboratory researches whose main duty is scientific research. Therefore the information component is always out of date and the new arrivals usually are not included in the collection database in time. Thus, it would be very useful and desirable for the LE-BIN collection to build the collaboration with the WDCM to be able to solve the problem with the collection dataware.