Ministry of Education and Science of Ukraine
Mechnykov Odesa National University, Odesa, Ukraine
Kholodny Institute of Botany, Kyiv, Ukraine

Materials
of III International
Young Scientists conference

# Biodiversity. Ecology. Adaptation. Evolution

dedicated to 100 anniversary
from birth of famous Ukrainian lichenologist
Maria Makarevych
15 - 18 May 2007

Odesa, 2007

*Міністерство освіти і науки України*
*Одеський національний університет ім. І.І. Мечникова, Одеса*
*Рада молодих вчених біологічного факультету ОНУ ім. І.І. Мечникова, Одеса*
*Інститут ботаніки ім. М.Г. Холодного НАН України, Київ*

# PROCEEDINGS

# OF THE III INTERNATIONAL YOUNG SCIENTISTS CONFERENCE

# «BIODIVERSITY. ECOLOGY. ADAPTATION. EVOLUTION.»,

## DEDICATED TO 100 ANNIVERSARY FROM BIRTH OF

## FAMOUS UKRAINIAN LICHENOLOGIST MARIA MAKAREVYCH

## (ODESA, 15 - 18 MAY, 2007)

МАТЕРІАЛИ

III МІЖНАРОДНОЇ КОНФЕРЕНЦІЇ МОЛОДИХ ВЧЕНИХ

«РОЗМАЇТТЯ ЖИВОГО. ЕКОЛОГІЯ. АДАПТАЦІЯ. ЕВОЛЮЦІЯ.»,

ПРИСВЯЧЕНОЇ 100-РІЧЧЮ З ДНЯ НАРОДЖЕННЯ

ВИДАТНОГО УКРАЇНСЬКОГО ЛІХЕНОЛОГА М.Ф. МАКАРЕВИЧ

(М. ОДЕСА, 15 - 18 ТРАВНЯ 2007 Р.)

*«Печатный дом»*
*Одеса 2007*

*УДК 573(063)*
*ББК 28.ОЯ431*
*Б 636*

**Proceedings of the III International Young scientists conference «Biodiversity. Ecology. Adaptation. Evolution.», dedicated to 100 anniversary from birth of famous ukrainian lichenologist Maria Makarevych (Odesa, 15 - 18 May, 2007).- Odesa: Pechatniy dom, 2007. - 326 p.**

Thesae of reports reflecting contemporary level and main fields of research of Young scientists from Ukraine, Russia, Belarus, Moldova, Uzbekistan, Kazakhstan, Azerbaijan, Armenia, Georgia, Latvia, Poland, Bulgaria, Romania, Slovakia, Czechia, Germany, Finland, Sweden, USA and South Africa are presented in the book. The research fields include Botany, Zoology, Hydrobiology, Microbiology, Plant Physiology, Animal and Human Physiology, Ecology, Environmental Safety as well as Molecular Biology, Genetics and Biochemistry.

**Матеріали III Міжнародної конференції молодих вчених «Розмаїття живого. Екологія. Адаптація. Еволюція.», присвячена 100-річчю з дня народження видатного українського ліхенолога М.Ф. Макаревич (м. Одеса, 15 - 18 травня 2007 р.).- Одеса: Печатний дом, 2007.- 326 с.**

Збірка містить тези доповідей, в яких відображено сучасний стан та головні напрямки робіт молодих вчених України, Росії, Біларусі, Молдови, Узбекістану, Казахстану, Азербайджану, Вірменії, Грузії, Латвії, Польщі, Болгарії, Румунії, Словакії, Чехії, Німеччини, Фінляндії, Швеції, США та Південної Африки в галузях ботаніки, зоології, гідробіології, мікробіології, фізіології рослин, фізіології людини та тварин, екології, охорони довкілля, а також молекулярної біології, генетики та біохімії.

**Материалы III Международной конференции молодых ученых «Биоразнообразие. Экология. Адаптация. Эволюция.», посвященная 100-летию со дня роджения известного украинского лихенолога М.Ф. Макаревич (г. Одесса, 15 - 18 мая 2007 г.).- Одесса: Печатный дом, 2007.- 326 с.**

В сборник вошли тезисы докладов, в которых отражено современное состояние и основные направления работ молодых ученых Украины, России, Беларуси, Молдовы, Узбекистана, Казахстана, Азербайджана, Армении, Грузии, Латвии, Польши, Болгарии, Румынии, Словакии, Чехии, Германии, Финляндии, Швеции, США и Южной Африки в областях ботаники, зоологии, гидробиологии, микробиологии, физиологии растений, физиологии человека и животных, экологии, охраны окружающей среды, а также молекулярной биологии, генетики и биохимии.

## ОРГКОМІТЕТ КОНФЕРЕНЦІЇ



***Оргкомітет висловлює щиру подяку***
***Назарчуку Сергію Леонідовичу та Назарчук Ларисі Петрівні,***
***за всебічну допомогу при виданні цієї збірки***

***ISBN 978-966-389-099-9***

***Тези надруковані з максимальним збереженням авторської редакції***

**Maria Florianivna Makarevych**
(December 4, 1906 - February 24, 1989)

# BASEMENT OF EPOCH OF GEOGRAPHIC ANALYSIS OF LICHEN FLORA DEVELOPMENT (TO 100-YEARS BIRTHDAY OF MARIA F. MAKAREVYCH, DR. SC.)

**Sergey Ya. Kondratyuk**
*M. H. Kholodny Institute of Botany, Kyiv, Ukraine*
E-mail: ksya_net@ukr.net

In December 2006 Ukrainian lichenologists celebrated the 100-year anniversary of the birth of the famous Ukrainian botanist, Prof. Maria F. Makarevych (the Russian transliteration is Makarevich).

Maria Florianovna Makarevych (Fig. 1) was born in Moshny village in the Cherkassy district of Cherkassy Oblast (the central part of Ukraine) on the 4 December 1906 into a family of a physician. She completed her secondary education in Cherkassy and subsequently went to Kiev to study biology at Kiev University (at that time, the Kiev Institute of People's Education).

Starting in 1938 she specialized in lichenology as a postgraduate student under the supervision of Prof. A. M. Oxner. In 1946 she received her Ph.D. for her dissertation "Lichens of the Eastern Carpathians" and she defended her doctoral thesis Analysis of lichen flora of Ukrainian Carpathians (Makarevych 1964) at the Botanical Institute of the Russian Academy of Science in Leningrad (now St. Petersburg).

For almost a half of century (between 1936 and 1982) Maria Makarevych was associated with the M. H. Kholodny Institute of Botany of the National of Academy of Science of Ukraine. The major part of her working career (1940-1982) was devoted to the study of the lichen flora of the Carpathian region. She retired as a senior researcher in the M. G. Kholodny Institute of Botany in 1982.

Maria was an excellent all-round botanist best known for her two books. Her monograph, Analysis of the Lichen Flora of the Ukrainian Carpathians (Makarevych 1963), became the standard for the geographic analysis of regional lichen floras. It played a particularly important role in disseminating the principles of geographic analysis of regional lichen floras in the Russian-speaking countries of the former Soviet Union, principles first proposed by A. Oxner. Unfortunately A. Oxner's doctoral thesis, "Analysis and History of Soviet Arctic Lichen Flora Origin" defended in 1942 was never published. And a detailed description of his principles of geographical analysis as well as descriptions of each geographic element and lists of lichen species in each geographical group was published by M. F. Makarevych (1963) for such extensive areas as the Ukrainian Carpathians and included 860 new lichen records.

Furthermore she (Makarevych 1971) actively encouraged the use of correct terminology for geographical elements as well as validating the segregation of such geographical groups as multiregional: Atlantic, etc., together with the Estonian lichenologist, Prof. H. Trass. This work established the methodology for the geographic analysis of regional lichen floras throughout the Eurasian continent.

M. F. Makarevych became known internationally following the publication of her Flora (in Oxner 1956) and Handbook (Kopaczevskaia et al. 1971, 1977) as well as Atlas of Geographic Distribution of Lichens of the Ukrainian Carpathians (Makaravich et al. 1982). She was an excellent taxonomist who prepared treatments of such difficult genera as *Lecanora*, *Lecania*, *Opegrapha* etc. and described a number of new taxa, e.g., *Acrocordia bukowinensis*, *Lecanora nemoralis*, *L. multispora*, *Melaspilea oxneri*, *M. sudzuhensis* and *M. zerovii*. In addition to those mentioned above Maria Makarevych published more than 70 scientific papers on lichens of Ukraine, Belarus and the Russian Far East.

The following theses, "Lichen flora of beech forests of Ukraine" (Navrotskaya 1984) and "Lichens of montane Zeravshan (Tajikistan)" (Kudratov 1979), were successfully defended by students supervised by Maria Makarevych.

The recent edition of the checklist of lichen-forming, lichenicolous and allied fungi of the Eastern Carpathians (Kondratyuk et al. 2003) was dedicated to the memory of Maria Makarevych.

Maria enjoyed life outside of botany, particularly the literature, art and history of her mother country. Together with her husband, O. V. Topachevsky, the well-known phycologist, hydrobiologist, founder and first director of Institute of Hydrobiology of National Academy of Sciences of Ukraine, they raised two sons: one the famous paleontologist and Academician of National Academy of Sciences of Ukraine, Professor Vadim O. Topachevsky and the second, a well known journalist, writer and film director, Andrij O. Topachevsky.

We remember her as a scientist, as a colleague always ready to help, as an advocate for lichens and as a very kind person.

LITERATURE CITED

*Kondratyuk, S. Ya., Popova L.P., Lackovicova A. & Pisut I.* 2003. A catalogue of eastern Carpathian lichens. Kiev: M.H. Kholodny Institute of Botany, National Academy of Sciences of Ukraine; Bratislava : Institute of Botany, Slovak Academy of Sciences. 264 pp.

*Kopaczevskaia E. G., Makarevych M. F.*, & *Oxner A. N.,* 1977. Handbook of the Lichens of the U.S.S.R. 4. Verrucariaceae-Pilocarpaceae. Izdatel'stv «Nauka, « Leningrad. 343 pp.

*Kopaczevskaia E. G., Makarevych M. F.*, *Oxner A. N. & Rassadina K. A.,* 1971. Handbook of the Lichens of the USSR. 1. Pertusariaceae, Lecanoraceae, and Parmeliaceae. Izdatl'stvo «Nauka, « Leningrad. 410 pp.

*Kudratov I.,* 1979. Lishajniki gornogo Zeravshana [Lichens of montane Zeravshan]. - Kiev: N.G. Kholodnogo Institute of Botany. 23 pp.

*Makarevych, M. F.,* 1963. Analiz likhenoflory Ukrainskykh Karpat. Kyiv, Vyd-vo Akademii nauk Ukr. RSR. 263 pp.

*Makarevych, M. F.,* 1964. Analysis of the Lichen Flora of the Ukrainian Carpathians. Akad. Nauk SSSR, Bot. Inst. im. V. L. Komarova [Leningrad]. 33 pp.

*Makarevych, M. F.,* 1971. Rezhenzia na kn. H.H. Trassa "Elementy I razvitie lichenoflory Estonii [Review on H.H. Trass's book "Elements and development of the lichen flora of Estonia"]. Ukrainian Botanical Journal, 28 (6): 795-797.

*Makarevych, M. F., Navrotskaya I. L. & Udina I. V.* 1982. Atlas Geograficheskogo Rasprostraneniia Lishainikov v Ukrainskikh Karpatakh. Kiev, Naukova dumka. 312 pp.

*Oxner A.M.,* 1956. Flora lyshajnykiv Ukrainy, T. 1 [Flora of the lichens of Ukraine, vol. 1]. - Kiev: Publishing house of Academy of Sciences of Ukrainian SSR. 496 p.

*Navrotskaya I.L.,* 1984 Lyshainiki bukovykh lesov Ukrainy [Lichens of beech forests of Ukraine]. Kiev: H.G. Kholodny Institute of Botany. 20 pp.

# ОСНОВА ЕПОХИ РОЗКВІТУ ГЕОГРАФІЧНОГО АНАЛІЗУ ЛІХЕНОФЛОР (ДО 100-РІЧЧЯ З ДНЯ НАРОДЖЕННЯ ВІДОМОГО УКРАЇНСЬКОГО ЛІХЕНОЛОГА МАРІЇ ФЛОРІАНІВНИ МАКАРЕВИЧ (4 ГРУДНЯ 1906 – 24 ЛЮТОГО 1989)

**С.Я. Кондратюк**

У грудні 2006 року українські ліхенологи святкували 100-річчя з дня народження відомого українського ботаніка, ботаніко-географа, доктора біологічних наук Марії Флоріанівни Макаревич.

Марія Флоріанівна народилась в с. Мошни Черкаського р-ну Черкаської обл. 4 грудня 1906 року в сім'ї лікаря. Вона закінчила середню школу в м. Черкаси, потім вивчала біологію у Київському університеті (на той час Київському інституті народної освіти).

З 1938 року Марія Флоріанівна спеціалізувалася в ліхенології як аспірант під керівництвом відомого українського ліхенолога проф. А.М. Окснера. В 1946 році вона захистила кандидатську дисертацію «Лишайники Східних Карпат», а в 1964 у Ботанічному інституті Російської АН в Ленінграді (нині - Санкт-Петербург) - докторську дисертацію «Аналіз ліхенофлори Українських Карпат».

Майже півстоліття (між 1936 та 1982 рр.) життя та діяльність Марії Флоріанівни було пов'язане з Інститутом ботаніки АН УРСР (сьогодні Інститутом ботаніки ім. М.Г. Холодного НАН України). Її наукова діяльність переважно зосереджувалася на вивченні ліхенофлори Карпатського регіону. Марія Флоріанівна пішла на пенсію в 1982 р. старшим науковим співробітником Інституту ботаніки.

М.Ф. Макаревич була знана як ботанік з широким колом інтересів, зокрема, завдяки монографії «Аналіз ліхенофлори Українських Карпат» [7], а також виданому разом з колегами «Атласу географического распространения лишайников Украинских Карпат» [16]. Монографія «Аналіз ліхенофлори Українських Карпат» [7] стала визнаним взірцем проведення географічного аналізу регіональних ліхенофлор. Вона відіграла виключно важливу роль у поширенні принципів географічного аналізу регіональних ліхенофлор, які були вперше сформульовані А.М. Окснером в його докторській дисертації «Анализ и история происхождения лихенофлоры соверского сектора Арктики» (Окснер 1940-1942). На жаль, докторська робота А.М. Окснера не була опублікована в повному обсязі і була доступна лише дуже обмеженому колу фахівців. У праці М.Ф. Макаревич [7] вперше висвітлено основні принципи проведення географічного аналізу, наведено описи кожного географічного елементу ліхенофлори та списки видів лишайників кожного географічного елементу, кожного типу ареалу та групи поширення. Тому ця монографія була дійсно настільною книгою для ліхенологів з даного питання, можна без перебільшення стверджувати, що вона стала основою подальшого розквіту епохи географічного аналізу ліхенофлор. Слід зазначити, що за кількістю ареалогічних груп (типів ареалів та груп поширення), виділених у складі ліхенофлори Українських Карпат, на той час представленої 860 видами лишайників, монографія М.Ф. Макаревич [7] не має аналогів і до сьогодні. Пізніше Марія Флоріанівна брала активну участь в обговоренні правильної термінології щодо географічних елементів, а також щодо обгрунтованості виділення таких географічних елементів як мультирегіональний, атлантичний тощо серед зональних географічних елементів [8-11, 15]. Вона неодноразово обговорювала методологію проведення географічного аналізу регіональних ліхенофлор всього Євразіатського континенту.

Марія Флоріанівна стала визнаним систематиком-ліхенологом завдяки її публікаціям у «Флорі лишайників України» [6] та «Определителе лишайников СССР» [10, 12]. Як прекрасний систематик вона опрацювала такі важкі для визначення роди лишайників, як леканора (*Lecanora*), леканія (*Lecania*), опеграфа (*Opegrapha*) тощо. Описала більше 10 нових для науки таксонів лишайників, зокрема *Acrocordia bukowinensis*, *Lecanora nemoralis*, *L. multispora*, *Melaspilea oxneri*, *M. sudzuhensis* та *M. zerovii* [3-5, 13, 15]. У цілому Марія Флоріанівна опублікувала понад 70 наукових праць, присвячених лишайникам України, Білорусі та російського Далекого Сходу.

Під керівництвом Марії Флоріанівни були захищені кандидатські дисертації «Анализ лихенофлоры горного Зеравшана» [1] та «Лишайники букових лесов Украины» [17].

Пам'яті М.Ф. Макаревич присвячені деякі ліхенологічні видання, зокрема «Зведений список лишайників та ліхенофільних грибів Східних Карпат» [18], «Ліхеноіндикація (посібник)» [2], а також деякі наукові форуми, що проводитимуться в 2007 році.

Крім ботаніки, Марія Флоріанівна дуже добре знала і любила літературу, мистецтво та історію рідної країни. Разом з чоловіком, відомим українським гідробіологом, засновником та першим директором упродовж багатьох років Інституту гідробіології АН УРСР, академіком Олександром Вікторовичем Топачевським вони виростили двох синів. Старший, Вадим О. Топачевський, відомий палеонтолог, академік, професор; молодший- Андрій О. Топачевський, відомий журналіст, письменник та кінорежисер.

В Інституті ботаніки ім. М.Г. Холодного ми пам'ятаємо Марію Флоріанівну як справжнього, принципового та дуже вимогливого і до себе, і до інших колег науковця, і одночасно дуже чуйну та добру людину, що завжди була готова прийти на допомогу.

Цитована література

1. *Кудратов И.* Лишайники горного Зеравшана. - К.: Ин-т ботан. им. Н.Г. Холодного, 1979. - 23 с.

2. *Кондратюк С.Я., Мартиненко В.Г.* Ліхеноіндикація (посібник). - Київ-Кіровоград: ТОВ „КОД", 2006. - 260 с.

3. *Макаревич М.Ф.* Про новий вид з роду *Melaspilea* // Ботан. журн. АН УРСР. - ч. 5, № 2. - 1948. - с. 88-91.

4. *Макаревич М.Ф.* Про новий вид з роду *Acrocordia* // Ботан. журн. АН УССР. - 1954. - 11, № 2. - С. 75-77.

5. *Макаревич М.Ф.* Два нових види з роду *Lecanora* Ach. // Ботан. журн. АН УССР. - 1954. - 11, № 4. - С. 59-65.

6. *Макаревич М.Ф.* Графідові - Graphidaceae // А.М. Окснер „Флора лишайників України". - К., 1956. С. 223-257.

7. *Макаревич М.Ф.* Аналіз ліхенофлори Українських Карпат. - К. : Вид-во АН УРСР, 1963. - 263 с.

8. *Макаревич М.Ф.* Зональный географический элемент как принципиальная основа географического анализа // Закавказская конференция по споровым растениям, посвященная 50-летию Октябрской социалистической революции. Том 3. Тбилиси: Ин-т ботан. Грузинской ССР, 1968. - С. 215-221.

9. *Макаревич М.Ф.* Рецензія на кн. Х.Х. Трасса „Элементы и развитие лихенофлоры Эстонии" // Укр. ботан. журн. - 1971. - 28, № 6. - С. 795-797.

10. *Макаревич М.Ф.* Роди *Pertusaria* DC., *Lecanora* (Ach.) Th. Fr., *Ochrolechia* Massal., *Lecania* (Massal.) Zahlbr., *Haematomma* Massal., *Candelariella* Massal. // Определитель лишайников ССС Р. Вып. 1: Пертузариевые, Леканоровые, Пармелиевые. - Л.: Наука, 1971. - С. 7-68. 72-146, 242-281.

11. *Макаревич М.Ф.* Современное состояние и проблемы ареалогического изучения лишайников в СССР // Тез. Докл. V делег. съезда ВБО. - К: 1973. - С. 357-358.

12. *Макаревич М.Ф.* Роди *Acrocordia* Massal., *Arthopyrenia* Massal., *Leptorhaphis* Körb., *Microthelia* Körb., *Anthracothecium* Hampe ap. Massal., *Melanotheca* Fée, *Dermatina* Almqu., *Lithographa* Nyl., *Melaspilea* Nyl., *Opegrapha* Humb., *Graphis* Adans., *Enterographa* Fée, *Chiodecton* Ach., *Dirina* Fr., *Lecanactis* Eschw., *Arthonia* Ach., *Arthothelium* Massal., *Byssoloma* Trevis. // Определитель лишайников СССР. Вып. 4: Веррукариевые -Пилокарповые. - Л.: Наука, 1977. - С. 152-160, 166-174, 188-195, 198-203, 210-218, 223-273, 275-278, 280-288, 290-328.

13. *Макаревич М.Ф., Княжева Л.А.* Новый вид рода *Melaspilea* Nyl. // Нов. системат. высш. и низш. раст. - К.: Наук. думка, 1974. - С. 118-122.

14. *Макаревич М.Ф. Melaspilea sudzuhensis* Mak. - новий вид лишайника з Далекого Сходу // Укр. ботан. журн. - 1976. - 33, №1. - С. 86-88.

15. *Макаревич М.Ф.* Хорологические особенности лишайников Украинских Карпат // VII съезд УБО (тез. докл.). - К.: Наук. думка, 1982. - С. 369.

16. *Макаревич М.Ф., Навроцкая И.Л., Юдина И.В.* Атлас географического распространения лишайников в Украинских Карпатах. - Киев: Наук. думка, 1982. - 404 с.

17. *Навроцкая И.Л.* Лишайники буковых лесов Украины. - Киев: Ин-т ботан. им. Н.Г. Холодного, 1984. - 20 с.

18. *Kondratyuk S. Ya., Popova L.P., Lackovicova A. & Pisut I.* A catalogue of eastern Carpathian lichens. Kiev: M.H. Kholodny Institute of Botany, National Academy of Sciences of Ukraine; Bratislava : Institute of Botany, Slovak Academy of Sciences, 2003. - 264 pp.

# Section 2. Mycology and lichenology

## THE COMMUNITY OF FUNGI IN BREWERS GRAIN ON DIFFERENT STAGES OF STORAGE

**Bol'shakov V.N., Nikonov I.N.**
*All Russia Research Institute for Agricultural Microbiology, St.-Petersburg, Russia*
E-mail: ilya-nikonov@yahoo.com

The brewers grain is extracted residue of pure barley malt or mixed with other grain plants, grain products, which are used in process of production of wort. The brewers grain includes coats of grain, insoluble parts of grain, almost of all fat and protein of grain. The main part of waste of brewing (82-87%) is brewers grain. The problem of utilization of brewers grain is current importance in Russian Federation. The monitoring of succession microbecenoses in brewers grain, is taking at storage is essential for working approaches of utilization. The aim of this investigation was to study complex of fungi in brewers grain on different stages of storage.

The brewers grain was got from factory of OAO "Baltica". The numbers and species of micromycetes were defined in fresh brewers grain and samples brewers grain during different periods of storage (1, 2 months) in laboratory. The community of fungi was isolated on on beer-wort agar medium (beer-wort - 4° Balling, agar - 1.2%) and Chapek agar medium. Cultivation was carried out at 26°C. Also were defined numbers and species of *Lactobacterium*, *Acetobacterium* and saprogenous microflora. The fungi were identified by morphological indication in pure cultures. The structure of microbial community was analysed with using ecological indexis (Odum, 1976).

In the brewers grain on different stage of storage were discovered 8 species of fungi, belong to genus *Aspergillus* and *Penicillium*. *Penicillium chryzogenius* was dominant species in the community of fungi. In the all variants of experiment the growth of micromicetes on Chapek agar medium wasn't found. The numbers of fungi on beer-wort agar medium was declined on 25% in 1 month and on 75 % in 2 month in comparison with fresh brewers grain. At that the community of fungi was become poor too. Evidently this process could be concerned with increase of saprogenous microflora (in the 1st month) and *Acetobacterium* (in the 2 month of storage).

### ГРИБНОЕ СООБЩЕСТВО ПИВНОЙ ДРОБИНЫ НА РАЗНЫХ СРОКАХ ХРАНЕНИЯ

Большаков В.Н., Никонов И.Н.

Изучено грибное сообщество пивной дробины на разных сроках хранения в лабораторных условиях. Определён видовой состав грибов на основании морфологических признаков. Проведён анализ структуры грибного сообщества по экологическим индексам. Выявлены взаимосвязи между уменьшением численности грибов и увеличением гнилостной и уксуснокислой микрофлоры.

## DETERMINATION OF INCOMPATIBILITY FACTORS IN *PLEUROTUS OSTREATUS* HOMOKARYONS

**Demchenko S., Tyfkiy A.**
*Donetsk National University, Donetsk, Ukraine*

A basidiocarp of *Pleurotus ostreatus* produces basidiospores according to a tetrapolar mating system: each spore represents either four mating types. The mating type in a tetrapolar hymenomycete is determined by a two biallelic incompatibility factors (A and B). Allelic differences in these loci result in different mating types. A basidiospore is incompatible with another spore having the same mating type.

Field isolates of *Pleurotus ostreatus* are dikaryotic; karyogamy and meiosis take place in basidia; resultant basidiospores are haploid. A basidiospore germinates into a homokaryotic mycelium where all the nuclei are haploid and genetically similar. The cells are multinucleate and all the septa are simple. A homokaryon may grow for an indefinite time in a suitable substrate but in pure culture it tends to degenerate earlier than heterokaryons. Homokaryons may occasionally abnormal fruit in pure culture, but such fruit bodies have not been found in nature. When two compatible homocaryons meet each other they fuse into a heterokaryotic colony, the cells of which contain both parental nuclei separately. After heterokaryotization, clamp connections start to develop occasionally in cell divisions. Heterokaryotic mycelium is the normal vegetative mycelium of *Pleurotus ostreatus*. It is more vigorous than homocaryons, able to produce normal fruit bodies.

We determined the mating types among the progeny of single-basidiospore isolates from one fruit bodies of *Pleurotus ostreatus* field isolate T-11. Seven homocaryiotic isolates have been paired in all combinations and appearance of clamps in the paired mycelia recorded. Four mating types are found in researched homokaryons, according to the heterothallic tetrapolar sexual system. The compatible mating types (homokaryons contain different A and B incompatibility factors) are observed in seven cases. The half-compatible mating types on A-locus (homokaryons contain the identical A incompatibility factor) are found in five cases. The half-compatible mating types on B-locus (homokaryons contain the identical B incompatibility factor) are revealed in five cases. The incompatible mating types (homokaryons contain identical A and B incompatibility factors) are found in four cases. The homocaryotic isolates are distributed in four groups based on the incompatibility factors (isolates №14 and №32 contain $A_2B_2$-factors, isolates №12, №17 and №19 contain $A_1B_1$-factors, isolate №8 contain $A_1B_2$-factors, isolate № 35 contain $A_2B_1$-factors).

### ОПРЕДЕЛЕНИЕ ФАКТОРОВ НЕСОВМЕСТИМОСТИ У МОНОКАРИОНОВ *PLEUROTUS OSTREATUS*

Демченко С.И., Тюфкий А.В.

С помощью теста совместимости определен половой статус моноспоровых культур, выделенных из природного изолята *Pleurotus ostreatus* Т-11. Они распределены в четыре группы, которые соответствуют тетраполярной системе несовместимости гриба.

## THE CHOICE OF AN OBJECT AND BIOINDICATION METHODS WITH THE PURPOSE OF THE ESTIMATE OF AIR POLLUTION IN KYIV (UKRAINE)

**Dymytrova L.**
*M.G. Kholodny Institute of Botany, Kyiv, Ukraine*
E-mail: lestes-virens@mail.ru

Many investigations have been carried out throughout the world to estimate air pollution in cities and large-scale industrial centers using lichens and bryophytes. Ninety-one indices were hitherto used for mapping of air pollution in different regions (Geebelen, Hofmann, 2001).

The lichenological and bryological material was collected from March to November 2006 at 250 sampling units in the right bank part of Kyiv city. A total of 53 lichen species and 20 bryophyte species were found. Five indices, which combine different parameters such as number of species (Herben & Liska, 1986; van Dobben, 1990), the ecological index Q (average number of accompanying species) only (De Sloover & Leblanc, 1968), the ecological index, a cover and a frequency of species simultaneously (Leblanc & De Sloover, 1970), were used for each of three objects: lichens, bryophytes and both of them. A total of 15 indices were calculated. Results are shown in maps indicating zones with different air pollution. It was established, that indices, which take into consideration the total number of corticolous lichens or their ecological index, gave a significant correlation with the map of air pollution produced on the base of instrumental data. Indices, using a quantitative estimate of a cover and an abundance as well as indices based on an investigation of bryophytes only, did not show a high correlation with instrumental data.

Thus, the conclusion that for the estimate of air pollution in Kyiv only corticolous lichens will be used in future investigations. We recommend to carry out mapping of air pollution on the base of the number of species present within each sampling unit as well.

ВИБІР ОБ'ЄКТУ ТА МЕТОДІВ БІОІНДИКАЦІЇ З МЕТОЮ ОЦІНКИ АТМОСФЕРНОГО ЗАБРУДНЕННЯ У М. КИЄВІ (УКРАЇНА)

Димитрова Л.В.

Проведено порівняння розрахунку 5 різних біоіндикаційних індексів для кожного з трьох об'єктів дослідження: лишайників, мохоподібних та епіфітів. Встановлено, що найбільшу кореляцію з картиною забруднення міста, що складена на основі інструментальних даних, дають індекси, що враховують загальну кількість видів епіфітних лишайників.

## SPECIFIC COMPOSITION OF PHYTOPATHOGENIC MICROMYCETES OF BOTANICAL GARDEN OF VERNADSKII NATIONAL TAVRIDA UNIVERSITY

**Dzunenko A., Prosyannykova I.**
*Vernadskii National Tavrida University, Simferopol, Ukraine*
E-mail: ProIr@yandex.ru

The botanical garden of National Tavrida University after Vernadskii V.I. (TNU) (area - 36 hectares) is organized in 2004 on the basis of landscape park «Salgyrka» of Simferopol. The vegetation of park is represented by the more than 7 thousand specimen of trees and bushes. On the systematic belonging they go to 116 species, 75 genera and 37 families. In connection with the organization of expositions of floral-decorative cultures on the territory of the Botanical garden in 2004-2006 (rosarium, iridarium and syringarium ) there was a necessity in the monitoring carrying out of the phytosanytary state of collections, and also in study of the affection on arboreal-and-frutescent and herbaceous vegetation of the garden by phytopathogenic micromycetes. The complex systematic study of phytopathogenic micromycetes of the botanical garden of TNU was carried out in details including the routs method during two vegetation' seasons 2005-2006. As a result of the conducted research we found out 72 species of 32 genera of parasitic fungi. The representatives of departments Deuteromycota and Ascomycota are dominant - 33 and 30 species of fungi, that is 87,5 % from the common amount of species and representatives of Basidiomycota department are considerably less - 9 species (12,5 %). On the garden roses (rosarium, area - 1 hectares), represented by 172 species, several flashes of farinaceous dew infection (*Sphaerotheca pannosa* Lev.), black leaf spot (*Marsonina rosae* Wolf.) and rust (*Phragmidium mucronatum* (Pers.) Schlecht) were outlined. Mycological researches were also carried out on the exposition of perennial floral-decorative cultures (iridarium, area - 300 square metres). The collection of irises, taking the leading role in the exposition, is represented by 150 species of iris bearded (*Iris hybrida* Hort.) and also 30 sorts of elands and 20 sorts of St. Bernard lilies. We found out five species of excitants of illnesses of iris vegetative organs from which fungus *Heterosporium iridis* (Fautr et Roum) Jacques was the most harmful. The considerable infection of leaves of peonies (*Paeonia* L.) by rust fungus *Cronartium flaccidum* (Alt. et Schw.) is outlined. In the exposition of natural flora of Crimea we found out three species of mildew powder fungi and three species of rust fungi.

ВИДОВОЙ СОСТАВ ФИТОПАТОГЕННЫХ МИКРОМИЦЕТОВ БОТАНИЧЕСКОГО САДА ТАВРИЧЕСКОГО НАЦИОНАЛЬНОГО УНИВЕРСИТЕТА ИМ. В.И. ВЕРНАДСКОГО

Дзюненко Е.А., Просянникова И.Б.

В ходе проведенных микологических исследований за вегетационные сезоны 2006-2006 гг. на территории Ботанического сада ТНУ обнаружено 72 вида 32 родов паразитических грибов. Доминирующими являются представители отделов Deuteromycota и Ascomycota.

## CELLULOLITIC ACTIVITIES OF HIGHT BASIDIOMYCETES LAETIPORUS SULPHUREUS AND SCHIZOPHYLLUM COMMUNE IN SUBMERGED CULTURES

**Dzygun L., Linovytska V., Klechak I.**

*NTUU «KPI», Faculty of Biotechnology and Biotechnique, Kiev, Ukraine*

E-mail: linavita@aport.ru, vmail@bigmir.net

Investigations on physiology-biochemical properties of wood-rotting basidiomycetous fungies are essential for the creation of new technologies. These technologies are oriented both on the production of biomass, biological activity substances and the utilization of lignocelluloses wastes. Various enzymes and pharmacological properties of *Laetiporus sulphureus* (Bull.: Fr.) Murrill and *Schizophyllum commune* Fr. promote interest in designing a technology of cultivation on the base of different substrates, in first place, in conditions of submerged cultures.

This work is devoted studying on the particularities of cellulolitic enzyme activity of two strains *L. sulphureus* and four strains *S. commune*. Cultivation was carried in flats on the shaker (160-180 rpm) at +28˚C, on liquid salt medium ($NH_4NO_3$ - 3 g/dm$^3$; $KH_2PO_4$ - 1 g/dm$^3$; $K_2HPO_4$ - 1 g/dm$^3$; $MgSO_4 \cdot 7H_2O$ - 0,4 g/dm$^3$) with different additions: peptone, beer wort, extract of yeasts, molasses, corn extract, glucose. Activity of carboxy-metyl cellulase (CMC-activity) and level hydrolysis filter paper (FP-activity) was determined.

The dynamic of cellulolitic enzyme activity was similar for all strains - the highest importances were registered on the 2-3 and 6-7 days of cultivations. The maximal level of CMC-activity was on the 7 day and was 1223 μM/(h·cm$^3$) in strain 1760 *S. commune* on the medium with corn extract and 837 μM/(h·cm$^3$) in strains 1774 *L. sulphureus* on the medium with beer wort. At the same time, FP-activity was 970 μM/(h·cm$^3$) in strain *S. commune* on the medium with molasses and 133 μM/(h·cm$^3$) in strains *L. sulphureus* on the medium with beer wort.

Thus, it was determined that the highest activity of cellulolytic enzymes observed in nourishing medium with additions of vegetable origin which contain polysaccharides, which are the substrates for these enzymes. Such additions are corn extract and molasses for *S. commune* and beer wort for *L. sulphureus*.

In the result two strains were selected: strain 1760 *S. commune* and 1774 *L. sulphureus* with higher of carboxy-metyl cellulas, and FP-activity.

### ЦЕЛЮЛАЗНА АКТИВНІСТЬ ВИЩИХ БАЗИДІОМІЦЕТІВ *LAETIPORUS SULPHUREUS* ТА *SCHIZOPHYLLUM COMMUNE* В ГЛИБИННІЙ КУЛЬТУРІ

Дзигун Л.П., Ліновицька В.М., Клечак І.Р.

В роботі досліджено целюлолітичну активність у 6 штамів вищих базидіальних дереворуйнуючих грибів *Laetiporus sulphureus* та *Schizophyllum commune* в умовах глибинного культивування на комплексних поживних середовищах. Встановлено, що найвища активність у всіх досліджуваних штамів спостерігалася на 2-3 та 6-7 доби культивування на середовищах з додаванням пивного сусла, меляси або кукурудзяного екстракту.

## TOWARDS A MOLECULAR SYSTEMATIC OUTLINE OF XANTHORIOID LICHENS

**Fedorenko N.M.[1], Stenroos S.[2], Thell A.[3], Kondratyk S. Ya.[1]**

*[1]M.H. Kholodny Institute of Botany, Kyiv, Ukraine*

*[2]Botanical Museum, Helsinki, Finland*

*[3]Botaniska museet, Lund, Sweden*

E-mail: nata_fedorenko@ukr.net

Molecular investigations of xanthorioid lichens are hitherto presented only in a few papers (Franc & Kärnefelt, 1998; Murtagh et al., 2002; Søchting et al., 2002; Gaya et al., 2003; Søchting & Lutzoni, 2003; Lindblom & Ekman, 2005; 2006). However, they are usually devoted to analyses of single taxa or small groups, and they do not give information on relationships within the entire group of xanthorioid lichens.

The aim of our study is to clarify the phylogenetic status and position of various groups (incl. *Xanthoria parietina*-, *X. candelaria*-, *X. ulophyllodes*-, *X. elegans*- and *X. ligulata*- groups) within xanthorioid lichens. Total DNA was extracted from fresh specimens or herbarium material (H, LD, KW). Three different DNA-fragments, the complete ITS1-5,8S-ITS2 regions and partial mtSSU rDNA and GAPDH regions, were studied.

Complete sequences from the ITS-regions of 14 samples and partial sequences of 12 samples of 37 analyzed specimens were obtained. Six species are sequenced for the first time: *X. ligulata*, *X. monofoliosa* ad int., *X. papillifera*, *X. rexfilsonii* ad int., *X. streimannii*, and *X. ucrainica*. The mtSSU and GAPDH genes have not been studied for any of the earlier species investigated. The mtSSU gene worked for all samples whereas the GAPDH gene for two species of the *X. ulophyllodes*-group only.

Preliminary results of analyses based on the ITS rDNA regions and mtSSU gene separately and combined revealed the following strongly supported groups: *X. parietina* s. str. (incl. *X. parietina*, *X. monofoliosa* and *X. elixii*), *X. candelaria* (incl. *X. candelaria*, *X. polycarpa*, *X. ucrainica*), *X. ulophyllodes* (incl. *X. ulophyllodes*, *X. fulva*, *X. fallax*, *X. borealis*, which does not form a monophyletic group itself), *X. elegans* (incl. *X. elegans*, *X. papillifera*) and *X. ligulata* (incl. *X. ligulata* and *X. streimannii*).

Studies of additional specimens will be carried out to better understand these groups' positions within the xanthorioid lichens.

### ДО СИСТЕМАТИЧНОЇ СТРУКТУРИ КСАНТОРІОЇДНИХ ЛИШАЙНИКІВ ЗА МОЛЕКУЛЯРНИМИ ДАНИМИ

Федоренко Н.М., Stenroos S., Thell A., Кондратюк С.Я.

Нами було отримано часткові та повні послідовності ITS-ділянок для 26 зразків ксанторіоїдних лишайників, з яких для 6 видів (*X. parietina*, *X. ligulata*, *X. elegans*, *X. candelaria* груп) - вперше; часткові послідовності mtSSU гену для 37 зразків вже вказаних груп та *X. ulophyllodes*-групи, а також GAPDH гену лише для 3-х зразків *X. ulophyllodes*-групи - також вперше. Вперше отримано дані про існування 5-6 монофілетичних груп серед ксанторіоїдних лишайників.

## DYNAMICS OF PECTOLYTIC ACTIVITY OF THE STRAINS K-1, I-6 *IRPEX LACTEUS* FR. AND CS-1 *CORIOLUS SINUOSUS* FR. AT VARIOUS TEMPERATURE OF CULTIVATION

**Filippova J.O., Bojko S.M.**

*Donetsk national university, Donetsk, Ukraine*

E-mail: bsm73@mail.ru

The higher basidiomycetes use as producers of the important commercial substances, such as antibiotics, vitamins, etc. Consider use of enzymes basidiomycetes (protease, cellulase, pectinase) at processing tissue, for removal of starch, preparation of yeast, yogurts, cheese, vine, beer, fermentation a grapes (Rai Inderba, 2003).

The purpose of our research was to determine influence of various temperatures on accumulation of pectolytic enzymes in cultural filtrate of fungi I-6 *Irpex lacteus* and CS-1 *Coriolus sinuosus*. The strains were cultivated in glucose-peptone nutrient medium where a unique source of carbon - glucose, was replaced with citron pectin in concentration 1g/l. The cultivation was carried out during 8 day at temperatures 24°C, 28°C, 32°C which correspond to their maximal growth rate. Activity of endopolygalacturonases defined of the viscosimetric method. For unit of the pectolytic activity accepted amount of enzyme, which in strictly certain conditions at temperature 30°C for 10 minutes catalyzed of hydrolysis 1 g pectin, reducing viscosity of a solution on 30 %.

Experiments were carried out in triple frequency. The data were exposed to statistical processing. As a result of the carried out experiments we have established, that strain I-6 *Irpex lacteus* as much as possible accumulates of pectolytic enzymes at temperature 32°C for 4 day cultivation (0,031 g/l). For strain K-1 *Irpex lacteus* the optimal temperature appeared 28°C. The maximum was observed with 4 for 8 day and averaged 0,032 g/l. At strain CS-1 *Coriolus sinuosus* synthesis of pectolytic enzymes is on a low level (the maximal values at temperature 24°C - 0,007g/l on 7 day cultivation).

The received data have shown, that the greatest of pectolytic activity possess strains K-1, I-6 *Irpex lacteus* at temperatures 28°C, 32°C accordingly. They can be considered further as possible producers of pectinase.

ДИНАМИКА ПЕКТОЛИТИЧЕСКОЙ АКТИВНОСТИ ШТАММОВ K-1, I-6 *IRPEX LACTEUS* FR. И CS-1 *CORIOLUS SINUOSUS* FR. ПРИ РАЗЛИЧНЫХ ТЕМПЕРАТУРАХ КУЛЬТИВИРОВАНИЯ

Филиппова Ю.О., Бойко С.М.

Высшие базидиальные грибы используют как продуценты важных коммерческих веществ (ферменты, антибиотики, витамины и др.). Полученные данные показали, что наибольшей пектолитической активностью обладают штаммы K-1, I-6 *Irpex lacteus* при температурах 28°C, 32°C соответственно. Они могут быть рассмотрены в дальнейшем как возможные продуценты пектиназ.

## MYCOFLORA OF SOIL SARIASIYA TUMAN, UZBEKISTAN

**Gafforov Yu.Sh., Nuraliev H.H., Iminova M.M., Allayarov N.D.**

*Scientific Center of Plant Production "Botanika" of the Uzbek Academy of Sciences, Tashkent, Uzbekistan*

E-mail: fungi_uz@yahoo.com

In 2006 the flora of soil fungi in some kinds in soil was studied. The kinds of soil which were studied are: light-grey soil (irrigated for a long time), light-grey soil (which is recently begun irrigated) and virgin lands (not cultivated) of Sariasiya tuman. The obtained samples of soil were studied and revealed 50 species of soil fungi. They refer to 21 genera and 3 subdivisions.

The subdivision Zygomycotina includes 7 species of genera *Mucor*, *Rhizopus*. The subdivision Ascomycotina includes only one species of genus *Chaetomium*.

The prevailing species are imperfect fungi (Deuteromycotina) which include classes *Coleomycetes* (1 species of genus *Phoma*), Hyphomycetes (42 species of 18 genus). According to the scale of revealed species in the first place are genera *Aspergillus* (7), *Penicillium* (4), *Fusarium* (3), *Cladosporium* (3). From oldly irrigated soils 35 species of fungi were isolated, which refer to 12 genera. From recently irrigated soils -29 species of 17 genera, from virgin soils-20 species of 98 genera it is revealed that the richest soil of genera content is newly irrigated soils and by species content is oldly irrigated soils.

In newly irrigated soils there are mostly spread Mucorales fungi. Obviously, it is explained by the fact that their initial place was in suktstessiya of fungi which participate in decay of plant remains.

In oldly irrigated soils there are dark-colored Hyphomycetes (*Alternaria*, *Curvularia*, *Macrosporium*) are found. Fungi are less spread in virgin soil. The representatives of genera *Aspergillus* and *Penicillium* are frequently met both in virgin and other soils.

The monitoring over seasonal dynamics of soil fungi shows that, the content of fungi in soil depends on season. In newly irrigated and virgin soils the maximum indication of species diversity and fungi colonies are observed in autumn. In summer the quantity of species decreases in some degree, and in winter - it almost disappears.

In spring species of class Zygomycetes especially genera *Mucor predominates*. In summer species of genus *Aspergillus* and frequently *Aspergillus niger*, *A. flavus* and in autumn there are dark colored Hyphomycetes: *Cladosporium*, *Alternaria*, *Stemphylium* and others, in winter - *Penicillium* are found.

Till 30 cm is the richest layer of the soil with fungi, with the increasing of depth the quantity of fungi and their species gradually decreases.

МИКОФЛОРА ПОЧВ САРИАСИЙСКОЙ ТУМАНА, УЗБЕКИСТАН

Гаффоров Ю.Ш.,Нуралиев Х.Х., Иминова М.М., Аллаяров Н.Д.

В результате проведенных исследованных почвенных образцов всего было выделено 50 видов почвенных грибов, которые относятся к 21 родам из 3 подотделам.

## MACROMYCETES OF THE YAZYAVAN STEPPE OF THE FERGHANA VALLEY

**Iminova M.M., Gafforov Yu.Sh.**
*Scientific Center of Plant Production "Botanika" of the Uzbek Academy of Sciences, Tashkent, Uzbekistan.*
E-mail: fungi_uz@yahoo.com

Properly organized measures on the protection of crops from diseases are on means of raising of crop yields. It is closely connected with the mycoflora studies. Data of mycoflora of macromycetes in the Ferghana Valley, in particular of the Yazyavan steppe, we tried to reveal the main characteristic features of their distribution and spreading depending on the seasonal prevalence and altitudinal zonation.

During the route investigations we carried out observation, collected herbarium samples and registered plants concomitant to macromycetes. In the 2004 we determined 20 species of macromycetes belonging to classes Hymenomycetes, Gastromycetes, 3 orders, Aphyllophorales, Agaricales, Lycoperdales and 6 genera. Species *Tulostoma volvulatum* Borscz. is new records for macromycetes Uzbekistan. All isolated macromycetes develop early in spring. *Agaricus bernardii* (Quel.) Sacc., *Climatocybe sapida* Lebed., *Lycoperdon papillatum* Schaeff. are wide spread among grassy vegetation and are the typical components of the Yazyavan steppe zone. Every year in spring species *Pleurotus eryngii* appear in large amounts, population use it as a food-stuff.

Species composition of macromycetes if the Yazyavan steppe isn't high but it reflexes diversity of conditions in this region.

### МАКРОМИЦЕТЫ ЯЗЯВАНСКОЙ СТЕПИ (ФЕРГАНСКАЯ ДОЛИНА)

Иминова М.М., Гаффоров Ю.Ш.

В результате проведенных исследований выявлено 20 видов макромицетов, относящихся к 2 классам, 3 порядкам и 6 родам. Из них 18 видов являются новыми для Ферганской долины и один вид- для микофлоры Узбекистана. Проанализированы закономерности распределения выявленных видов грибов по сезонам года.

## THE EPIPHYTIC LICHENS FLORA OF DZHERGINSKY NATURAL RESERVE (NORTHERN PRIBAIKALJE)

**Kharpukhaeva T.M.**
*Institute of General and Experimental Biology of Siberian Department of RAS, Dzheginsky natural reserve, Ulan-Ude, Russia*

Dzherginsky reserve is situated in northern part of Baikal basin on slopes of South Muysky and Ikatsky ranges (54°56′ - 55°27′ S.L., 111°11′ - 111°58′ E.L.) on altitude 800-2500 m in upper basin stream of Bargusin river (Buryatia, Russia). Coniferous boreal forests take active part in vegetation.

Epiphytic lichen flora considers 98 species from 46 genus and 21 families. 49 foliose, 20 fruticose and 29 crustose lichens found in epiphytic flora. 41 lichen species were found on larch (*Larix gmelinii* (Rupr.) Rupr.), more than on others trees. On the average on every tree species 18 lichens species live in.

Epiphytic lichen flora make prevalent by boreal element. The leading families are Parmeliaceae (35 species). Among foliose lichens prevalent genus *Parmelia*, *Hypogymnia*, *Vulpicida*, *Melanelia*, *Tuckermannopsis*, *Parmeliopsis*. Genus *Usnea*, *Evernia* and *Bryoria* dominate among fruticose species. Its spreads in different community, but large relationship with larches forests are distinguish.

In low zone of taiga families Physciaceae, Collemataceae, Teloschistaceae presented. On trunks and branches sinusia are formed by *Physconia detersa*, *Physcia stellaris*, *Ph. aipolia*, *Ph. tribacia*, *Caloplaca cerina*, *Collema subnigrescens*, *Candelariella aurella*, *Xanthoria candelaria*, *Rinodina septentrionalis*, *R. sophodes*.

Such lichens as *Usnea cavernosa*, *Phaeophyscia hispidula*, *Heterodermia speciosa*, *H. japonica*, *Ramalina roesleri*, *R.* sinensis, *Lecanora chlarothera*, *L. albellula* relate to dark taiga with *Abies sibiricus* Ledeb., *Pinus sibiricus* Du Tour and *Picea obovata* Ledeb. Rare and tertiary relict species for region *Leptogium burnetiae*, *Graphis scripta*, *Opegrapha rufescens*, *Koerberia biformis* also inhabit in this community. Forests of *Populus suaveolens* occupy small patch of valley, but its provide sheltered sites for mesophilic nemoral lichens.

### ЭПИФИТНАЯ ЛИХЕНОФЛОРА ДЖЕРГИНСКОГО ЗАПОВЕДНИКА (СЕВЕРНОЕ ПРИБАЙКАЛЬЕ)

Харпухаева Т.М.

В работе рассматриваются эпифитные лишайники, встречающиеся в Джергинском государственном природном заповеднике (Северное Прибайкалье). Всего обнаружено 98 видов из 46 родов и 21 семейства.

## SCLEROPHOMA SHOOT BLIGHT IN BELARUS

**Kirilenkova N.**
*Belarusian State Technological University, Minsk, Belarus*
E-mail: kirilenkova@inbox.ru

Last years in the countries of the Europe and in Russia a new illness of coniferous breeds - Sclerophoma shoot blight is observed. The given disease is characterized defeat of needles similar with shoot blight, and necrosis defeat of sprouts bark. Till now Sclerophoma shoot blight was not registered in Belarus and was object of quarantine. During the autumnal-winter period of 2006 in territory of basic nursery Negorelskiy forestry at carrying out forestpathologic inspections the defeat of *Pinus sylvestris* two-year-old seedlings has been revealed and the anamorphous fungus *Sclerophoma pityophila* (Corda) Hohn has been identified.

In literature *S. pityophila* is mentioned on plants of *Abies*, *Cupressus*, *Juniperus*, *Picea*, *Pinus*, but the greatest nocuous it causes to *Pinus sylvestris*. Sclerophoma - a doubtless cosmopolitan. The illness is noted in the Great Britain, France, Germany, Czechoslovakia, Poland, Latvia, in Russia, and also in the USA, Canada, Southern Africa and Australia.

The signs of the illness can be found out during all vegetative period. Three types of defeat are marked out. At the first type the sprouts accept the S-shaped form without change of their painting, presence dark-brown necrosis sites is possible.

In the second case the sprouts are deformed; they have bright-red painting and become vitreous. The needles are routed in full or in part with formation wide brown strangulations. The necrosis sites are dark-brown, then grayish color with black oval or round shape pycnidium breaking through cracks of a bark. At the third type of defeat the sprouts get goldish-rusty painting, but are not bent. The necrosis sites small, brown. The character of the needles extinction is as at the second type. As a result of development of the illness in nurseries the output of a standard landing material decreases. In wood cultures at strong and numerous defeat the trees lag and they become multitopmost. Thus, additional researches in nurseries in territory of Belarus are necessary, because that new disease can potentially represent threat for the coniferous breeds of our republic.

СКЛЕРОФОМОЗ В БЕЛАРУСИ

Кириленкова Н.Ф.

При лесопатологическом обследовании питомника Негорельского учебно-опытного лесхоза впервые для республики было обнаружено поражение двухлетних сеянцев сосны обыкновенной анаморфным грибом *Sclerophoma pityophila* (Corda) Hohn. Приводится описание внешних признаков поражения сеянцев склерофомозом.

## NEW LICHENS FOR SAMARA REGION

**Korchikov E.S.**
*Samara State University, Samara, Russia*
E-mail: evkor@inbox.ru

There are many areas in Samara region that are fairly poorly known with respect to their lichen flora. Today only Zhiguli State Reservation is studied very well (Шустов, 1988, 2002). Our investigations since 2002 have touched upon Zhiguli State Reservation too, then, forests in the suburb of Tolyatti, Kinel, Krasnosamarsky forest and steppes in southern Samara region. In total 1 lichen order (Mycocaliciales Tibell et Wedin), 1 family (Mycocaliciaceae Schmidt), 6 genera (*Agrestia*, *Bryoria*, *Chaenothecopsis*, *Flavopunctelia*, *Protoparmelia*, *Platismatia*), 16 species were found for the first time in Samara region. The collected specimens are stored at the Herbarium of the Samara Sate University. Further the species list is given:

- *Agrestia hispida* (Mereschk.) Hale et Culb. This very rare lichen was found in Artemisia association on the soil near Big Gluschitsa village.
- *Bacidia vermifera* (Nyl.) Th. Fr. is rather common on the low part of oak, lime trunks in Krasnosamarsky forest. It has small apothecium, that's why it's not visible.
- *Bryoria capillaris* (Ach.) Brodo et D. Hawksw. is a rather scattered lichen in Krasnosamarsky forest on aspen and birch trees.
- *Bryoria implexa* (Hoffm.) Brodo et D. Hawksw. grows on pine and lime. It has no soredia, consequently it's a very rare lichen.
- *Bryoria subcana* (Nyl. et Stiz.) Brodo et D. Hawksw. grows on birch and aspen trees
- *Candelariella xanthostigma* (Ach.) Lett. has small apothecia and a leprous thallus.
- *Chaenothecopsis viridireagens* (Nádv.) Schmidt is from a new family and a new order for lichen flora of Samara region. It's a nonlichenicolous fungi.
- *Cladonia decorticata* (Flörke) Spreng. has the smallest podetio among our lichens, up to 5 mm. Its habitats are deciduous parts of Krasnosamarsky forest.
- *Cladonia scabriuscula* (Delise in Duby) Nyl. grows in coniferous habitats.
- *Cladonia squamosa* Hoffm. It has a rather long phylloclade, up to 5 mm.
- *Flavopunctelia soredica* (Nyl.) Hale. This previously Asiatic lichen is getting Zavolzhye steppe along Volga and Samara rivers barks.
- *Hypogymnia bitteri* (Lynge) Ahti. This also Asiatic lichen presence in Zavolzhye steppe may be connected with juvenile pine from Penza region transmition.
- *Melanelia elegantula* (Zahlbr.) Essl. occurs only in mesophytic conditions.
- *Peltigera lepidophora* (Nyl. ex Vain.) Bitter. Unique locality of this lichen is Krasnosamarsky forest, Festuco-Crinitaria habitats.
- *Protoparmelia nephaea* (Sommerf.) R. Sant., a saxicolous lichen was found in Festuco-Stipa habitats in southern Samara region.
- *Platismatia glauca* (L.) W. Culb. et C. Culb. Some juvenile thallium was found only on 2 old pine stems in coniferous habitat of Krasnosamarsky forest.

НОВЫЕ ЛИШАЙНИКИ ДЛЯ САМАРСКОЙ ОБЛАСТИ

Корчиков Е.С.

Для лихенофлоры Самарской области впервые приводится порядок Mycocaliciales, семейство Mycocaliciaceae, 6 родов и 16 видов.

## MYXOMYCETES RESEARCH OF LA RÉUNION

**Krivomaz T.**
*European Mycological Association, Kyiv, Ukraine*
E-mail: mktania@ln.ua

In May 2006 during Myxomycetes expedition with support Global Biodiversity of Eumycetozoans project (PBI) was international collaboration between Myxomycetes sciences: Grazina Adamonité (Lithuania), Tetyana Krivomaz (Ukraine), Alain Michaud (France), El-Hacène Séraoui (Switzerland) in La Réunion. This French Overseas Island (DOM), La Réunion is located in the Indian ocean (21° lat. S, 55°20 long. E - 2512 km$^2$), volcanoes created three millions years ago. Two volcanoes take up the major part of the island: The "Piton des Neiges" (3069m) and the "Piton de La Fournaise"

(2631m) which is still active (last eruption in 2005). Located to 200 km North of Tropic of Capricorn, La Réunion gets a warm and humid tropical climate. Forests of *Crypyomeria*, *Tamarindus* and *Cyathea* cover the largest part of the island. We collected myxos in different altitudes, from sea-side to the highest wooded slopes, Belouve, Cilaos, Grand Brûlé, La Fenêtre, Les Makes, L'Etang Salé les Bains, Plaine des Chicots. The best substratum for myxomycetes of La Réunion is *Agave verte*. In old forest from *Cryptomeria japonica* we found only few species myxomycetes. For moist chamber El-Hacène Séraoui used barks and small branch of *Acacia heterophylla*, aerial litter of *Nastus borbonicus* and *Cyathea* sp., twigs and barks of *Cryptomeria japonica*, leaves of *Agave verte* and *Eucalyptus* sp., twigs of *Cocos nucifera*, flowers of *Yuka* sp. and stems of *Cyrcium* sp. One hundred and seventy two field collections of myxomycetes were obtained. Sixty-one species representing twenty genera were identified from specimens. The best present order Physarales - 33 species, then less for Liceales - 12, Trichiales - 9, Stemonitales - 5, and only 1 species for Echinosteliales and Protosteliales. The most freguently occuring and widely distributed species of myxomycetes are *Arcyria cinerea* (Bull.) Pers., *Didymium squamulosum* (Alb. et Schwein.) Fr., *Physarum compressum* Alb. et Schwein., *P. superbum* Hagelst. Rare species *Willkommlangea reticulata* (Alb. et Schwein.) Kuntze was founded.

ДОСЛІДЖЕННЯ МІКСОМІЦЕТІВ ЛЯ РЕНЬОНУ

Кривомаз Т.І.

Протягом міжнародної експедиції у травні 2006 р. на острові Ля Реньон досліджувалась острівна біота міксоміцетів. Загалом зібрано 172 польових зразки, з яких визначено 61 вид, що належать до 20 родів і 6 порядкам. Знайдений рідкісний вид *Willkommlangea reticulata* (Alb. et Schwein.) Kuntze. Проведені експерименти з вологими камерами.

## MICROSCOPIC FUNGI ON ARCHIVAL DOCUMENTS

**Kuprevich T.**

*V.F. Kuprevich Institute of Experimental Botany, Minsk, Belarus*

E-mail: lingred@mail.ru

Archives, libraries, museums constantly face a problem of biological damage of funds. Fungi are the most active destroyers of the documents executed on paper among all known living organisms.

For the study of archival documents micobiota the samples of paper damaged by fungi from 35 archival documents of the end XVII - XIX centuries were taken. Materials collecting was carried out in National Historical Archive of Belarus. Micromycetes from paper were isolated by the method of direct prints. Micromycetes from archival depository air were isolated by Koch method. Twenty two isolates were collected from paper surface and 51 from archival premises air. The nutrient mediums used were Czapek agar and Czapek potato broth agar. The collection of fungi includes 25 species of 8 genera and 2 classes.

The majority of micromycetes, according to literature data, have the ability of paper, cardboard and wood destruction. And hence, they are capable to be or act as components of paper mycocenoses. Exceptions are *Aspergillus chevalieri*, *Cunninghamella* sp., *Cladosporium oxysporum*. They are not mentioned in the literature as destructors of cellulose-containing materials. But they form communities of archival depositories and contact with archival documents (Kanevskaya, 1984; Lugauskas, 1987; Nyuksha, 1994). The most species-rich genera are *Aspergillus* (6 species) and *Penicillium* (10 species). 24 species belong to Deuteromycetes and only one species *Mucor racemosus* - to Zygomycetes.

In some cases micromycetes did not isolated from samples of paper with visible fungal damage. The paper was pigmented, shabby, easily breaks, but the presence of fungal hyphae and spores however was not registered. Possibly the reason of it is the loss of fungus viability.

Fungal damage was localized in strictly certain places: on book page edges, in the center of page, at books back, on the cover. There were lesions on documents both with pigmented spots of the same or different pigmentation. It means the presence in one place one or several fungal species.

Our observations tell about the selectivity of micromycetes habitats, their joint or strictly isolated development, finiteness of life term of fungal community on paper, and about dynamics of its composition.

МИКРОСКОПИЧЕСКИЕ ГРИБЫ НА АРХИВНЫХ ДОКУМЕНТАХ

Купревич Т.В.

При исследовании микобиоты архивных документов выделено 25 видов микромицетов, относящихся к 8 родам и 2 классам. Дан анализ видового состава с описанием некоторых особенностей формирования сообществ грибов на бумаге.

## INFLUENCE OF VARIOUS SOURCES OF NITROGEN ON GERMINATION OF *MORCHELLA STEPPICOLA* ASCOSPORES

**Kutkova O.**

*Donetsk National University, Donetsk, Ukraine*

E-mail: Kutkovaya@dongu.donetsk.ua

Morels are one of the most valuable and popular mushrooms in the world, both on taste properties, and on medicinal properties (Prasad et al., 2002; Pilz et al., 2001). At the territory of Ukraine 6 species of genus *Morchella* are distributed, among which and the especial species brought in the Red Data Book of Ukraine - *Morchella steppicola* Zer. (Смицкая, 1980). In this connection research of distribution of the given species in a nature and features of development in laboratory conditions is interesting and actual.

We investigate influence of various sources of nitrogen on germination of *M. steppicola* ascospores. Solutions of various compounds of nitrogen influenced on speed and character of germination of *M. steppicola* ascospores which germinated, and

also on amount ascospores which germinated. The solutions of urea and yeast extract forwarded germination of *M. steppicola* spores. If in the control (distilled water), the spores started to germination after 6 hours of wetting, but in above marked solutions germination of spores began after 5 hours. At a wetting in peptone growth tubes at ascospores occur after 7 hours, in solutions of ornithine and ammonium nitrate - after 10 hours, and in sodium nitrate and ammonium sulphate - after 24 hours incubation. In comparison with the control (the percent spores which germinated has made - 10,62 %) the percent ascospores which germinated have significant increased at a wetting in a solution of a yeast extract (81,01 %). All other sources of nitrogen inhibited ability for germination of ascospores (the percent spores which germinated has made from 1,62 % (ammonium nitrate) up to 6,72 % (urea)), and in such solutions as a lysine, an ammonium molybdate and ammonium citrate spores at all did not germinated. Ascospores of *M. steppicola* germinated by one or two growth tubes. Thus in solutions of sodium nitrate and an ammonium sulphate the majority of spores has germinated by one growth tube, in an ammonium nitrate on 50 % of spores have germinated by one and two tubes, in other compounds of nitrogen the primary quantity of ascospores was formed two growth tubes. Thus, with the help of addition in suspension of spores of fixed sources of nitrogen it is possible to control amount of *M. steppicola* ascospores which germinated and forming growth tubes.

ВПЛИВ РІЗНИХ ДЖЕРЕЛ АЗОТУ НА ПРОРОСТАННЯ АСКОСПОР *MORCHELLA STEPPICOLA*

Куткова О.В.

Досліджено вплив різних джерел азоту на проростання аскоспор *M. steppicola*. Встановлено, що лише дріжджовий екстракт вірогідно підвищував кількість проростих спор при порівнянні з контролем, всі інші сполуки азоту пригнічували проростання спор. В лізині, амонії молібденовокислому та амонії лимоннокислому спори взагалі не проростали.

## THE INFLUENCE OF PHITOHORMONE – GIBBERELLIN ON THE ONTOGENESIS OF EDIBLE AND MEDICINAL OYSTER MUSHROOM (*PLEUROTUS OSTREATUS* (JACQ.: FR) KUMM.)

**Kuznecova O.V., Zakolesnyk N.V.**

*Ukrainian State Chemical Technology University, Dnipropetrovs'k, Ukraine*

E-mail: biotech_ugxtu@mail.ru

Interest to study the regulation systems in fruit bodies of higher edible mushrooms has increased recently. It is caused by necessity to reception ecologically pure albumin products and to increase the yield of mushrooms. The study of action exogenous of substances regulating growth was carried out on Basidiomycetes. These researches are representing the practical and theoretical interest as enable to reveal unknown aspects of principles hormonal regulation.

The influence of gibberellin on oyster mushroom *Pleurotus ostreatus* at the different stages of ontogenesis was studied in these work. The action of gibberellin on the growth and development mycelium *Pleurotus ostreatus* at surface cultivation was investigated. The subsequent influence of phitohormone on the formation fruit bodies mushroom were studied also. Gibberellin (10-3-10-5%) was entered in the nutrient medium for the reception of mycelium *Pleurotus ostreatus*. As a nutrient mediums was used the cereal-waters (wheaten and corn). The fruit bodies were cultivated from the mycelium, which was obtained during the experiment. The substrat from the husk of sunflower was used for this.

Gibberellin activated the starting of exponential phase the mycelium *Pleurotus ostreatus* growth. In dependences of nutrient medium type the morphological characteristics of mycelium by entered of gibberellin (10-4%) was improved. Under these the growth coefficient was increased on 5,1-22,4%. The increasing fruit-bodies production of mushrooms (biological effectively) on 35,5-166,5% on the mycelium with gibberellin was observed. In the result of investigation was established that gibberellin actives the fructification. The results of researches can be used at the industrial cultivation of *Pleurotus ostreatus*.

ИССЛЕДОВАНИЕ ВЛИЯНИЯ ФИТОГОРМОНА - ГИББЕРЕЛЛИНА НА ОНТОГЕНЕЗ ВЫСШЕГО БАЗИДИАЛЬНОГО ГРИБА *PLEUROTUS OSTREATUS*

Кузнецова О.В., Заколесник Н.В.

Изучали влияние гиббереллина на базидиомицет - *Pleurotus ostreatus*. Полученные результаты свидетельствуют, что экзогенный гиббереллин улучшает морфологические характеристики мицелия, что приводит к активации процесса образования плодовых тел.

## ANTIOXIDANT ACTIVITY OF MEDICINAL MUSHROOMS *FLAMMULINA VELUTIPES* (CURT.:FR.) P.KARST AND GANODERMA LUCIDUM (CURT.: FR) P.KARST STRAINS

**Kvasko E.[1], Krupoderova T.[2]**

*[1]Taras Shevchenko National University, Kiev, Ukraine*

*[2]N.G.Kholodniy Institute of Botany, Kiev, Ukraine*

E-mail: krupoderova@yahoo.de

The problem of oxidative stress and its significance for human organism is actual at last time. Oxidative stress causes many diseases, such as cardiovascular pathology, cancer, different infections and others. The screening of new antioxidants is important in modern pharmacology. Mushrooms are perspective subjects for receiving biological components with high level antioxidant activity (Badalyan, 2003).

Therefore, the aim of our research was the study of the antioxidant activity of medicinal mushrooms of *Flammulina velutipes* (Curt.:Fr.) P.Karst (strain 601) and *Ganoderma lucidum* (Curt.: Fr) P.Karst (strains 1621, 1903). The accumulation of biomass of investigated strains was studied at glucose - peptone medium (pH 5.5) at 28 °C during 28 days. Antioxidant activity was determined by index of inhibit constant of reaction at 7th, 14th, 21st, and 28th days of mycelial growth (Semenov, Jarosh, 1985).

Our results demonstrate that the maximum index of antioxidant activity of *F. velutipes* and *G. lucidum* strains was noted

at the 7th day in cultural liquid and at the 28th day in biomass. It was determinated that antioxidant activity in cultural liquid was in 2,3 time higher than in biomass for all strains. The index of antioxidant activity of *F. velutipes*, by comparison to strains *G. lucidum*, was in 1,2 time higher. It was noted that the investigated indexes of *G. lucidum* strains were differed - the strain 1903 had index in 1,2 times greater than strain 1621.

It was demonstrated that the index of antioxidant activity of biomass is increased with the time of cultivation, but contrary regularity was noted for cultural liquid of both investigated species. Thus, the cultural liquid during cultivation of *F. velutipes* and *G. lucidum* (7th day) was the most perspective for the biotechnology of antioxidant substances receiving.

АНТИОКСИДАНТНАЯ АКТИВНОСТЬ ШТАММОВ ЛЕКАРСТВЕННЫХ ГРИБОВ *FLAMMULINA VELUTIPES* (CURT.:FR.) P.KARST AND *GANODERMA LUCIDUM* (CURT.: FR) P.KARST

Кваско Е., Круподерова Т.

За показателем константы ингибирования реакции изучена антиоксидантная активность культуральной жидкости и биомассы штаммов *F. velutipes* и *G. lucidum* на 7-й, 14-й, 21-й и 28-й день культивирования на глюкозопептонной среде.

## RARE SPECIES OF CLASS MYXOMYCETES OF TVER REGION

**Lebedev A.N.**

*Botanical Garden of Tver State University, Tver, Russia*

E-mail: rumat@inbox.ru

Biota's level of research of myxomycetes of Tver region and in Russia in general allows to allocate some species, which need to be saved. The purpose of the given research, which is conducted within the framework of research of myxomycetes of Tver region, is to reveal rare species of class Myxomycetes, which need to be saved.

The check-list of myxomycetes of Tver region contains 108 species now. About 48% (52 species) were found once. The list of species, recommended for depositing in to the Red Book of Tver region is given. For the description the following scheme will be used: species name; the species status advisable at the given stage of research; comments (the distribution of species for European part of Russia): *Arcyria minuta* Buchet (4). This species is rare for taiga zone. The padding research with "Wet camera" method is necessary. *Brefeldia maxima* (Fr.) Rost. (2). The number of finding of this species in Russia reduced during last years. *Craterium minutum* (Leers) Fr. (0). This species has not been found for more then 100 years. It is possible to assume, that species has disappeared now. *Diderma fallax* (Rostaf.) Lado. (3). The given species is considered rare for Russia. *Hyporhamma intorta* (Lister) Lado. (3?). It is found in two regions only. From 1980 it was not found. *Lycogala conicum* Pers. (3). It is found in Tver region only. It's rare for Russia. *Metatrichia floriformis* (Schwein. ) Nann.-Brem. (3). It is found in Tver region only. *Physarum cinereum* (Batsch) Pers. (0). This species has not been found for more then 100 years. It is possible to assume, that species has disappeared now. *Prototrichia metallica* (Berk.) Mass. (3). It is found in two regions only. It is allocated on the basis of infrequent occurring in Russia.

As a result of primary analysis 9 species of myxomycetes were allocated (8,3% from a total number of species of region), recommended for depositing in to the Red book of Tver region. The second edition of the Red book is planned for 2012. By that time it will be possible to work out more definite criteria for allocating the species of myxomycetes. The material of this research will help improve the status of species put to the Red Book of Tver region.

РЕДКИЕ ВИДЫ КЛАССА MYXOMYCETES ТВЕРСКОЙ ОБЛАСТИ

Лебедев А.Н.

Целью исследования является выявление редких видов класса Myxomycetes, нуждающихся в охране. На данный момент список миксомицетов Тверской обл. включает 108 видов. Приводится список видов миксомицетов, рекомендуемых для внесения в Красную книгу Тверской обл. В результате выделено 9 видов миксомицетов нуждающихся в охране.

## EVALUATION OF COTTON COLLEKTION VARIETIES' RESISTANS TO FUNGI *V. DAHLIAE* KLEBAHN

**Mammadova N.Kh.**

*Genetic Resources Institute of ANAS, Azerbaijan, Baki*

Cotton is one of the valuable agricultural crops. A significant attention is being paid to production of this culture. However concerniag to spread of various diseases of cotton certain difficulties appeare at rate increase of production of this culture.

One of the most dangerous diseases of cotton is wilt. This disease is caused by fungi *Verticillium dahliae* Kleb. which concerns to imperfect fungies.

We studied resistance to wilt varieties of *G. hirsutum* L. and *G. barbadense* L. cotton species. The phytopathologic evaluation of cotton collection varieties resistance was carried out on an artificial - infectious background on a five-ball scale (Vaytenok, 1971). Symptom of disease is appearence of yellowish round and angular spots on leaves. The evaluation of cotton varieties resistance has shown different sensitivity of crops to diseases which has allowed to reveal the most resistant ones. On the results of our data of the varieties of the *G. barbadense* L. cotton species turned out more resistant to this disease. Id est per centage sick crops at the varieties of *G. hirsutum* L. species made -34,2 %, and at varieties of *G. barbadense* L. species -31,6%.

Amount and per centage of sensitive and highly sensitive to wilt varieties at *G. hirsutum* L. species twice exceeded than variety of *G. barbadense* L.cotton species id est these made accordingly - 11,9 % and 6,0 %.

The per centage of resistant varieties at *G. hirsutum* L. and *G. barbadense* L. cotton species equaled accordingly - 24,4 % and 41,0 %. The most resistant ones Todlo-21, Araure, UH-1, 5904-i of the *G. barbadense* L. cotton species. According to the above-stated one can make a conclusion, that the cotton varieties concerning to *G. barbadense* L. species are more resistant to wilt, than the varieties of *G. hirsutum* L. species. These varieties can be used in selection as donors of resistance to this disease.

ОЦЕНКА УСТОЙЧИВОСТИ КОЛЛЕКЦИОННЫХ СОРТОВ ХЛОПЧАТНИКА К ГРИБУ *V.DAHLIAE* KLEBAHN

Мамедова Н.Х.

Проведена фитопатологическая оценка устойчивости коллекционных сортов хлопчатника вида *G.hirsutum* L. и *G.barbadense* L. к грибу *V.dahliae* Klebahn. Установлено, что сорта хлопчатника, относящиеся к виду *G.barbadense* L. более устойчивы к этой болезни. Выделены сорта, которые могут быть использованы в селекции в качестве доноров устойчивости.

## THE NON-YELLOW SPECIES OF *RHIZOCARPON* RAMOND EX DC. (RHIZOCARPACEAE, LICHENIZED ASCOMYCOTA) WITH HYALINE AND MURIFORM ASCOSPORES, OCCURING IN POLAND

**Matwiejuk A.**

*Institute of Biology, University of Bialystok, Bialystok, Poland*

E-mail: matwiej@uwb.edu.pl

*Rhizocarpon* is a large genus of c. 200 described species included in the family Rhizocarpaceae, widely distributed in all parts of the world but particularly in alpine and polar regions. Species are long-lived, growing on rock, and have been widely used in studies on moraine-dating, a procedure known as lichenometry.The nine non-yellow species of the genus *Rhizocarpon* with hyaline and muriform ascospores are hitherto recognized in Poland. There are *Rhizocarpon distinctum*, *R. lavatum*, *R. obscuratum*, *R. oederi*, *R. petraeum*, *R. postumum*, *R. reductum*, *R. subgeminatum* and *R. umbilicatum*. These taxa are also know from North America and continental Europe and Asia. Their morphology, anatomy, ecology and distribution in Poland are investigated. A key to the species is provided. The most important characters for separating the treated species are pruinose/epruinose thallus, number of ascospores in asci, ascospore size and number of cells per ascospore in optical view, insoluble lichen pigments of the epihymenium and proper excipulum and lichen substances.

GATUNKI RODZAJU *RHIZOCARPON* RAMOND EX DC. (RHIZOCARPACEAE, LICHENIZED ASCOMYCOTA) O NIE ŻÓŁTYCH PLECHACH, Z BEZBARWNYMI I MURKOWATYMI ASKOSPORAMI

Matwiejuk A.

*Rhizocarpon* jest bogatym w gatunki rodzajem rodziny Rhizocarpaceae, liczącym około 200 gat. na świecie. Rozmieszczone są na całym świecie, głównie w terenach alpejskich i polarnych. Są to porosty długowieczne, rosnące na skałach, mające zastosowanie w metodzie datowania wieku skał, w lichenometrii. Dziewięć gatunków o nie żółtych plechach z murkowatymi i jasnymi zarodnikami odszukano i opisano w Polsce. Są to *Rhizocarpon distinctum, R. lavatum, R. obscuratum, R. oederi, R. petraeum, R. postumum, R. reductum, R. subgeminatum* and *R. umbilicatum.* Ich morfologia, anatomia, ekologia i rozmieszczenie w Polsce zostało zbadane.

## THE LICHEN FLORA OF PROTECTED TERRITORIES OF THE STEPPE ZONE OF ODESSA REGION

**Nazarchuk J.**

*Mechnykov Odessa National University, Odessa, Ukraine*

E-mail: bio_july@hotmail.com

There is a necessity in the study of the lichen flora of protected territories, as exactly the protected territories are marked by most degree of saving of gene pool of both plants on the whole and lichens, in particular. Besides, conservatism of lichens allows them to be the indicators of the environmental conditions and represent the degree of changes of the territory. Development of well-grounded scientific recommendations about the guard of lichens is possible only in the presence of objective evidence about the present condition of the lichen flora of certain protected territories. Information about lichens of reserves, landscape parks and other protected territories of the Odessa region was absent till recently, there were only data about lichens of the Danube Biosphere Reserve [Ходосовцев, 1999].

In 2004 - 2006 researches of lichen flora some of protected territories of the Odessa region were conducted [Назарчук, 2006, 2007; Назарчук, Кондратюк, 2007 in press.]. From some data, nature protection territories of Steppe zone represent about 70 % lichen flora of Steppe zone. However, the Steppe zone of the Odessa region in that behalf is the exception. The basic area of the protected objects of the Odessa region is represented, mainly, by unzonal forestland, as a rule, artificial origin, and also the reed bogs. Actually „steppe» reserves on the territory of region does not exist almost. Above all things it is concerned with the large degree of thrown open of lands, where steppe cenosis was saved only in a small areas, as a rule, on slopes of ravines.

In the Red book of Ukraine (1996) for the Steppe zone of the Odessa region mention such „steppe» species of lichens, as: *Cetraria steppae* (Savicz) Karnef., *Neofuscelia ryssolea* (Ach.) Essl., *Xanthoparmelia camtschadalis* (Ach.) Hale. Information about these species is based on collections of M.F. Makarevych of 1954. Unfortunately, we must establish, that territory of locations of these species in our time is fully thrown open, so, we can not talk about the presence of these species in Odessa region for the moment. In general, the lichen flora of protected territories represented, mainly, by epiphytic species, that confined to the forestland and have a wide adaptation potentialities. Small, but enough separated group of epiphytic lichens, that grow on steppes suffrutices, such as *Kochia* sp., *Ephedra distachya* L., *Chamaecytisus* sp., *Caragana* sp., and others meets on territories, where the plant association containing the above-listed suffrutices were saved. These territories, mainly, are the slopes of ravines. However most of such territories have no protection status in general, although for the Odessa region it is the last remainders of typical steppe vegetation, where the „steppe» species of lichens is kept yet.

ЛІХЕНОФЛОРА ЗАПОВІДНИХ ТЕРИТОРІЙ СТЕПОВОЇ ЗОНИ ОДЕСЬКОЇ ОБЛАСТІ

Назарчук Ю.С.

Обговорюються особливості ліхенофлори заповідних територій степової зони Одеської області. Показано, що ліхенофлора представлена, переважно, епіфітними видами, що приурочені до лісових масивів. Порівняно невелика кількість „степових" видів лишайників обумовлена незначною кількістю природоохоронних територій, де зберігається степова рослинність.

## PATHOGENIC MYCOBIOTA OF *VICIA SATIVA* L. AND IT'S WILD RELATIVES IN ARMENIA

**Nanagulyan S., Soghoyan Y.**
*Yerevan State University, Yerevan, Armenia*
E-mail: snanagulyan@ysu.am

Armenia is geo-morphologically and ecologically very varied, located on the crossroads between several phytogeographic regions and exceptionally rich floristically. Armenia has a long history of plants domestication, and has a lot of wild relatives of cultivated plants. In Armenia from forage plants *Trifolium*, *Medicago*, *Vicia*, *Onobrychis*, *Lathyrus* and others are distributed. The consecutive investigations on pathogenic mycobiota of Vicia have not been carried out in Armenia up to now. Separate dates on this question are found in some articles and published books connected with investigation of mycobiota of Armenia.

In Armenia grow about 40 sowing and wild species of *Vicia*, on which were found 20 species of microscopic fungi, that belong to 11 genera: *Ascochyta boltshauseri* Sacc., *A. fabae* Speg., *A. viciae* Lib., *Cercospora fabae* Fautr., *C. zonata* G. Winter, *Cladosporium pisi* Cugini et Macch., *Erysiphe pisi* DC., *Leveillula lactucarum* Durrieu et Ros., *Peronospora narbonensis* Gäum., *P. sepium* Gaum., *P. viciae* (Berk.) Casp., *P. viciae-sativae* Gäum., *Placosphaeria onobrychidis* (DC.) Sacc., *Phoma legumirum* Wested, *Phyllosticta fabae* West., *Ramularia craccae* Lindau, *Uromyces fabae* (Pers.) de By, *U. fisheri-eduardii* Magnus., *U. heimerlianus* Magnus., *U. viciae-craccae* Const.

Plants with disease symptoms were collected in different habitats: natural and cultivated areas. The majority of identified fungi has wild specialization, harmful to cultivated plants, and had influence on the epidemic situation of agrocenosis. Some of them possess a narrow biological specialization and might injure hosts of only certain species (*Ascochyta viciae*, *Cercospora fabae*, *C. zonata*, *Ramularia craccae*).

Thus, it is very important to continue the investigations of forage plants diseases, that will help the agriculture to breed new resistant species for growing.

### ПАТОГЕННАЯ МИКОБИОТА *VICIA SATIVA* L. И ЕГО ДИКИХ СОРОДИЧЕЙ В АРМЕНИИ

Нанагюлян С.Г., Согоян Е.Ю.

В статье приводятся данные о патогенной микобиоте 40 видов вики, произрастающих в Армении. На них обнаружено 20 видов грибов из 11 родов - *Ascochyta*, *Cercospora*, *Cladosporium*, *Erysiphe*, *Leveillula*, *Peronospora*, *Placosphaeria*, *Phoma*, *Phyllosticta*, *Ramularia*, *Uromyces*. Выявлены виды с узкой и широкой специализацией.

## STUDYING OF ARBUSCULAR MYCORRHIZA DEVELOPMENT IN PEA (*PISUM SATIVUM* L.)

**Nemankin T.[1,2], Shtark O.[1], Borisov A.[1], Tikhonovich I.[1]**
*[1]All-Russian Institute of Agricultural Microbiology, Pushkin, Russia*
*[2]Saint-Petersburg State University, Saint-Petersburg, Russia*
E-mail: nemankin@arriam.spb.ru

Pea (*Pisum sativum* L.), forming two types of endosymbiotic systems - nitrogen-fixing nodules and arbuscular mycorrhiza (AM) with fungi belonging to the phylum Glomeromycota, is one of the actively used model objects for studying beneficial plant-microbe interactions these days. The importance of research of these types of symbiosis is explained by a number of the reasons. First of all, it is a unique high degree of genetic integration between the partners and importance of these plant-microbe systems for agriculture. One of the main approaches to study these symbiotic systems is experimental mutagenesis of plants. In pea, more than 40 symbiotic genes have been identified. Mutational analysis of different collections of pea mutants impaired in nodulation has revealed eight plant genes involved in AM development (Borisov, 2000).

The analysis of AM development dynamics is labour-intensive and long-time process. Using of a modified inoculation system with a "nurse" plant Allium schoenop rasumh (Rosewarne, 1997) and with Glomus intraradices BEG144, which is characterized by high symbiotic activity, allowed to intensify and to lighten this process in pea. AM development in the roots was estimated by three parameters (Trouvelot, 1986): 1) number of appressoria per 1 cm of the root, 2) intensity of mycorrhizal colonisation in the root system, and 3) arbuscule abundance in mycorrhizal root fragments.

With the help of this system, dynamics of AM development of two independently obtained allelic mutants SGEFix$^-$-1 (sym40) and SGEFix$^-$-6 (sym40) and wild type line SGE has been described. These mutations differ by phenotypic manifestation (rate of AM development), especially at the early time points.

By using a double mutant line RBT3 (sym33, sym40) and two mutants in single gene SGEFix$^-$-2 (sym33) and SGEFix$^-$-1 (sym40), mode of interaction of the genes sym33 and sym40 during the process of AM development has been described. Mutant allele of gene sym33 has shown the developmental epistasis concerning an attribute "Intensity of mycorrhizal colonization in the root system" in this mutant gene pair. Mutant alleles of genes Sym33 and Sym40 interact on type complementation concerning an attribute "Arbuscules formation and function".

Thus, this method of studying of AM development contributed to describe a new allelic mutant SGEFix$^-$-6 (sym40) and a mode of interaction of genes sym33 and sym40.

**This work was financially supported by The Government contracts (02.445.11.7492, 02.434.11.7122), Grant of the President of Russia (НШ-9744.2006.04), Russian Foundation for Basic Research (04-04-48457, 04-04-48462, 07-04-01558, 07-04-01171), CRDF (ST-012-0), NWO (047.117.2005.006).**

### ИЗУЧЕНИЕ РАЗВИТИЯ АРБУСКУЛЯРНОЙ МИКОРИЗЫ У ГОРОХА ПОСЕВНОГО (*PISUM SATIVUM* L.)

Неманкин Т.А., Штарк О.Ю., Борисов А.Ю., Тихонович И.А.

С использованием модифицированной инокуляционной системы с растением-"няней" описано развитие арбускулярно-микоризного симбиоза у аллельных мутантов по симбиотическому гену гороха sym40 и характер взаимодействия генов гороха sym33 и sym40 в ходе развития этого симбиоза.

## *ALBATRELLUS CRISTATUS* (FR.) KOTL. ET POUZAR, A RARE APHYLLOPHOROID FUNGUS FIRSTLY RECORDED IN THE LEFT-BANK UKRAINE

**Ordynets O., Akulov O., Usichenko A.**
*V.N. Karasin National University, Kharkiv, Ukraine*
E-mail: ordynets@mail.ru

*Albatrellus cristatus* (Fr.) Kotl. et Pouzar was firstly described as *Boletus cristatus* by J.H. Shaeffer in 1774. In 1821 E.M. Fries included it to *Polyporus* Adans ex Fr, and then in 1957 Czech mycologists F. Kotlaba and Z. Pouzar transferred it to *Albatrellus* S.F. Gray. Now this fungus is a member of family Albatrellaceae (Pouzar) Nuss, order Polyporales (Herter) Gäum, class Basidiomycetes G. Winter (Fries, 1821; Ryvarden, 1993).

*A. cristatus* develops annual stipitate basidiocarps. Its detailed description could be found in L. Ryvarden, 1993. Basidiomata of *A. cristatus* are observed during summer in predominantly hardwood ecosystems on soil (may be on borrowed wood), but its wood-rotting ability remains a disputable question and requires further studies.

The species is known from many European countries, North America and East Asia. However, it is a rare species which is included in Red Lists of some European countries, where it has a high nature-conservative status and is inscribed in such categories as Rare (Bulgaria), Vulnerable (Norway), Endangered (Poland, Germany). In Ukraine *A. cristatus* earlier was known only from two regions of the right-bank part of the country - Right Bank Polissya and Roztochchya (Akulov et al., 2003).

In July of 2005 A. cristatus was firstly revealed by us in the Left Bank Forest-Steppe, so this is the first record of species in the left-bank Ukraine. The specimen was collected in Zmiev area, Kharkiv district on the territory of National Nature Park "Gomolshanskie Lesa" (the quarter N 34) in fresh oak forest - Tilieto-Quercetum. The specimen is preserved in mycological herbarim of V.N. Karasin Kharkiv National University CWU (Myc) under the serial number 1094. The correctness of our specimen determination was confirmed by H. Kotiranta, the specialist in aphyllophoroid fungi from Finland.

Probably, the rarity of *A. cristatus* could be explained by the fact that the spesies follows *Quercus* in distribution, i.e. is confined to oak forests, which are in declining situation now. This record of *A. cristatus* helped us to give practical recommendations to the administration of National Park about saving the severe regime of protection for the quarter N 34, where this species was found, and for adjacent quarters in order to save oak forest ecosystem.

### НОВИЙ ДЛЯ ЛІВОБЕРЕЖНОЇ УКРАЇНИ РІДКІСНИЙ ВИД АФІЛЛОФОРОЇДНИХ ГРИБІВ *ALBATRELLUS CRISTATUS* (FR.) KOTL. ET POUZAR

Ординець О.В., Акулов О.Ю., Усіченко А.С.

В липні 2005 р. на території Національного Парку "Гомільшанські ліси" (Зміївський район, Харківська область) було виявлено рідкісний вид афіллофороїдних грибів *Albatrellus cristatus*, що є приуроченим до дібров. Ця знахідка є новою для Лівобережжя України. Рекомендовано посилити режим охорони у частині парку, в якій цей вид було виявлено.

## FEATURES OF DEVELOPMENT OF FUNGUS *BOTRYTIS CINEREA* PERS. ON PLANTS OF SORT OF *LUPINUS* TOURN

**Pikovskiy M., Manishevskiy V., Moskalenko M.**
*National Agricultural University, Kyiv, Ukraine*
E-mail: mpikovsky@wm.nauu.kiev.ua

Cultivation of plants of sort of *Lupinus* Tourn is an instrumental in the decision of albuminous problem and saving the resourses in agriculture. At the same time, in separate vegetation periods different deseases of fungus etiology are extraordinarily dangerous, among them is grey mold, which is caused by necrophilous fungus - *Botrytis cinerea* Pers. and which is the course of shortage of the harvest. The fact is that a given disease on lupinus is unstudied.

The purpose of our researches was a study of features of development of grey rot on the plants of different types of lupin: on white (*Lupinus albus*), narrow-leaves (*L. angustifolius*) and yellow (*L. luteus*). Experiments were carried out by methods generally used in plant pathology and mycology.

The first signs of grey mold are marked by us in the period of pouring of bobs of lupin white. On the initial stages of development of the desease its symptoms are characterized with the appearance of the brown spot on the bob in the place where it stops it's development, and the astonished area grows into an ulcer.

As a rule, the origin of necrosis is timed to the places on which the dying petals of flowers stay too long. More intensive defeat of bobs of lupin by grey mold is marked in the period of their yellow maturity. At this time, parasitizing of fungus *B. cinerea* begins in the place of fastening of bobs to the stem. Astonished areas at first acquire a dirtily-brown-yellow color, and later a grey film appears on them. Lowering of the temperature of air leaded to the appearance of the sclerotiums on the surface of sick bobs, among the conidium sporification. Penetration of patogen's mycelium into the bobs causes the infecting of the seeds. A capsule at the infected seeds acquires whitish, rather yellow-grey tint, while in healthy it is whitishness.

Analysing damaging of plants whith a grey rot we must notice, that in the phase of flowering distribution of *B. cinerea* is not discovered on different sorts and types of lupins. In a ripening period desease had distribution on a white lupin. The fact is, that most of the plants were damaged on sorts September and Garant - according to 11,0 and 11,2 %. A little less distribution has grey rot on a sort Serpnevyi - 8,7 %. At last, development of the desease on the plants of sorts of lupin white was within the limits of 1,8-3,0 %. On the plants of *L. angustifolius* and *L. yellow* a grey mold was not found.

### ОСОБЛИВОСТІ РОЗВИТКУ ГРИБА *BOTRYTIS CINEREA* PERS. НА РОСЛИНАХ РОДУ *LUPINUS* TOURN

Піковський М.Й., Манішевський В.М., Москаленко М.Ю.

Наведено результати вивчення особливостей розвитку некротрофного гриба *Botrytis cinerea* Pers. на рослинах роду *Lupinus* Tourn. Досліджено уражуваність різних видів люпину: білого (*Lupinus albus*), вузьколистого (*L. angustifolius*) та жовтого (*L. luteus*).

## DISTRIBUTION OF FUNGI *SCLEROTINIA SCLEROTIORUM* (LIB.) DE BARY AND *BOTRYTIS CINEREA* PERS. ON SUNFLOWER PLANTS

**Pikovskiy M., Verdush O.**

*National Agricultural University, Kyiv, Ukraine*

E-mail: mpikovsky@wm.nauu.kiev.ua

In obedience to our researches, on the sunflower plants in the last years in Kyiv region most harmful is a mold, that caused by fungi *Sclerotinia sclerotiorum* (Lib.) de Bary and *Botrytis cinerea* Pers. The danger of the deseases caused by them is in fact that the potential shortage of harvest of this culture from white and grey molds can be more than 50 % (Yakutkin, 2001). Depending on time of infection of the baskets seeds in them do not appear or formed with the reduced sowing qualities.

The purpose of our researches was to investigate the features of development of fungi *S. sclerotiorum* and *B. cinerea* on the sunflower plants and to bring the estimation of stability to deseases of sorts and hybrids.

As a matter of fact, we have marked parasitizing of fungus *S. sclerotiorum* on stems and baskets of sunflower. White mold - the desease that caused by it, showed up on 28 % analysed sorts of different groups of ripeness. In the places of defeats of stems the white mycelium was formed, which looks like cotton wool, with black sclerotiums. Development of the desease resulted in softing up of tissues of sick stems and their partly breaking. Baskets, astonished in considerable extent, were soft up also, collapsed and disintegrated to pieces, what was torn away and fell off on the surface of the soil. The great number of sclerotiums of the fgungus of various form and sizes were formed inside and of the surface of sick baskets.

Fungus *B. cinerea* on the sunflower plants was parasitizing from the budding period. Later, the desease that was caused by it - a grey mold, observed on baskets in all periods of growth and development. On the astonished areas brown spots were quickly overgrew and covered with the thick ashes - grey film of micelium with the sporificatoin. Patogen also got inside the tissues of baskets and infected the seeds. Forming of the sclerotium stage during the vegetation of plants was not observed. The fact is, that parasitizing of *B. cinerea* is discovered by us on 100 % of probed sorts of sunflower.

At last we could notice, that the least frequency of apperrance of fungi *S. sclerotiorum* and *B. cinerea* and development of the deseases caused by them is marked on sorts Chumak, Syaiwo and Khortitsya.

ПОШИРЕННЯ ГРИБІВ *SCLEROTINIA SCLEROTIORUM* (LIB.) DE BARY AND *BOTRYTIS CINEREA* PERS. НА РОСЛИНАХ СОНЯШНИКУ

Піковський М.Й., Вердиш О.В.

Проаналізовано поширення грибів *Sclerotinia sclerotiorum* (Lib.) de Bary та *Botrytis cinerea* Pers. на рослинах соняшнику. Описано форми проявлення викликаних ними хвороб - білої та сірої гнилей. Виявлено сорти соняшнику Чумак, Сяйво та Хортиця частота трапляння на яких *S. sclerotiorum* і *B. cinerea* та розвиток захворювань були найменшими.

## GUARD SPECIES OF LICHENS IN OMSK REGION

**Plikina N.V.**

*Omsk state the pedagogicat university, Omsk, Russia*

E-mail: tele-text@yandex.ru

As from 1998, author studied flora of lichens West-Siberian plain of valley r. Irtish (Omsk region) and currently has prepared a number of recommendations on the lichen guard on this territory. In the «Red book USSR» (1984) from all dwelling on the given territory of lichens to the guard was recommended only: *Lobaria pulmonaria* (L.) Hoffm and *Usnea florida* (L.) Web in Wigg, *Bryoria fremontii* (Tuck) Brodo et D. Hawksw., *Omphalina hudsoniana* (Jenn.) Bigelow, but in «Red book RSFSR. Plants» (1988) - two last species and *Menegazzia terebrata* (Hoffm.) A. Massal. on facts K.A.Rassadina (1964).

At list is guarding species we have added crustose species of lichens. All lichens of region, requiring protection, possible divide into several groups, distinguishing geographical spreading and status the guard. To the first group we have refered lichens, for the first time met on the territory of region and not noted nowhere more on Russia territory. To the given group pertain: *Caloplaca assigena* (Lahm.) DT et Sarnth. (new species for flora of Russia and Asia), *Gyalecta nigricans* Vain. (second site in Russia).

Co to the second group are referred species, which rare in the region, but usual for its limits, in other parts Russia. The Given types require a protection on local, regional level. Here pertain: - species, dwelling on the lime in relictov limefree-birch-aspen and limefree-birch-larchfree woods on left riverside Irtish (*Buellia triphragmia*, *Gyalecta flotowii*, *Lecanactis deminuens*, *Micarea denigrata*, *Ramalina calicaris*, *Trapeliopsis viridescens*);

- crustose species, haunt on leaving the hard sorts (sandstones with contents of lime - *Caloplaca vitellinula*, *Lecanora dispersa*, Verrucaria nigrescens) and epigeides lichens (*Bacidia bagliettoana, Bacidia polychroa*, *Lecanora frustulosa*, *Lecanora muralis*;

- species, refer to the nonmoral geographical element and seldom meet in the region: *Arthopyrenia rhypontha*, *Everniastrum cirratum*, *Graphis scripta*, *Arthonia elegans*, *Candelariella reflexa*, *Megalaria laureri*, *Cresporhaphis wienkampii*, *Cliostomum corrugatum*, *Calicium adaequatum*, as well as bring on literary given *Parmelina quercina*, *Parmelina tiliacea*, *Evernia prunastri*, *Usnea barbata*, *Usnea plicata* (Spiridonov, 1928);

- species, refer to boreal the geographical element with the asiatic type of the area - *Usnea wasmuthii*, *Hypogymnia enteromorpha*;

- species of lichens, refer to epilichenophyta (*Saccomorpha uliginosa*, *Sphinctrina turbinata*).

Therefore, on the territory of region are rare 38 special of lichens, which are contributed in «Red book of Omsk region» (2005).

ОХРАНЯЕМЫЕ ВИДЫ ЛИШАЙНИКОВ В ОМСКОЙ ОБЛАСТИ

Пликина Н.В.

В работе приведены сведения о 38 видах лишайников, занесённых в Красную книгу Омской области.

## SOME ASPECTS OF STUDY FUNGI-PARASITES'S SPORES OF A PLANT

**Ponomareva T., Pogorelaya M., Ponomareva E., Kusainova S., Kusainov M.**
*Innovative University of Eurasia, Pavlodar, Kazakhstan*
E-mail: fso@pau.edu.kz, Mary16_82@mail.ru

The defeat of trees such as poplar, osiers, birches by fungi of the sort *Cytospora*, of Deuteromycetes class, of sphaeropsidales order is revealed in Pavlodar (Пономарева Т.М., 2001). As micelium is often geterocarioted, the fungi pertain to variable and very rolling in ecological sense group of fungi. Our earlier studies persuasively prove that fungi are accumulated in greater amount in the environment and save its viability for more than two years and they are capable of sprouting in different nourishing environment (Пономарева Т.М., 2001, 2003). The studies show that on 1 $m^2$of defeat bark there may be in one time about $5{,}6 \cdot 10^{13}$ spores. Under growing of spores in hanging drop and in Petri's cup on nourishing environment Saburo it has been got an active micelium on the second day and a stroma on sixth day. The calculation of CUE (the colonies forming units) has shown that when diluting $10^{-10}$ 50 mg picknospores (mass of average picknid) it has been got the 15 colonies.

Thus, in air environment of cities, where the technologies of a care of wood plantings are violated, there is an enormous quantity of spores of fungi. Having a high viability and ecological valency, the spores can be potentially dangerous for the health of people, it especially while taking an antibiotics and others immunodepressants.

1. Пономарева Т.М., Абиев С.А., Бызова З.М. Грибные болезни основных пород деревьев города Павлодара. Алматы, Вестник КазГУ, № 2., 2001. С. 26-29.

2. Пономарева Т.М., Гаврилова Н.Б., Краснопёрова Е.Ф. Изучение биологического загрязнения окружающей среды спорами грибов рода *Cytospora* и его влияния на здоровье человека. Материалы 2 научно - практической конференции 4-5декабря 2003 года. Часть1. Караганда., 2003. С. 294-297.

## НЕКОТОРЫЕ АСПЕКТЫ ИЗУЧЕНИЯ СПОР ГРИБОВ-ПАРАЗИТОВ РАСТЕНИЙ

Пономарева Т.М., Погорелая М.А., Пономарева Е.В., Кусаинова С.Ж., Кусаинов М.С.

В работе дана качественная и количественная оценка спорового материала грибов-паразитов деревьев на примере рода *Cytospora* в городских насаждениях тополя. Оценивается их значение, как компонента биологического загрязнения воздушной среды города.

## RARE EPIPHYTE LICHENS OF THE UGOLSKY MASSIVE OF CARPATHIAN BIOSPHERE RESERVE

**Postoyalkin S.V.**
*Kherson State University, Kherson, Ukraine*
E-mail: postoyalkin@yandex.ru, postoyalkin@list.ru

57 rare and disappearing epiphyte lichens in the Ugolsky massive of the Carpathian Biosphere Reserve are identified. Determination of the rarity of epiphyte lichens were carried out according to the scale of the frequency (Bayrak, 1998), due to which to this category of lichens belonged with occurring frequency from 1 to 3 locations.

Interensting and rare epiphytes grow on the species forest experimental areas of the Ugolsky forestry. However, on Lviv experimental area (betwen 18 and 25 blocks), situated in Voyevutske reservation (1050 metres above the sea) on the beeches 21 rare species of lichens are numbered. Among them, *Agonimia allobata*, *Bacidia circumspecta*, *Bacidia rubella*, *Bacidina chloroticula*, *Biatora chrysantha*, *Caloplaca ulcerosa*, *Catillaria nigroclavata*, *Cladonia caespiticia*, *Melaspilea gibberulosa*, *Mycoblastus fucatus*, *Parmelia submontana*, *Pertusaria flavida*, *Pertusaria pustulata*, *Physconia perisidiosa*, *Scoliciosporum sarothamnii*, *Trapelia corticola* were new for the Carpathian Biosphere reserve.

Numerous rare epiphyte lichens were found on the Ukrainian - Swiss forest constant experimental area. Among them, *Arthothelium ruanum*, *Biatora epixanthoides*, *Biatora efflorescens*, *Porina aenea*, *Rinodina efflorescens*, *Scoliciosporum sarothamnii* were considered as new for the Carpathian Biosphere reserve.

Rare epiphyte species of the lichens grew on the fruit and wild trees in the zone of anthropogene landscape near the administrative building of Mala Uglia forestry. Among them *Phaeophyscia nigricans*, *Sarcogyne privigna* were found within the Carpathian biosphere reserve for the first time.

## РІДКІСНІ ЕПІФІТНІ ЛИШАЙНИКИ УГОЛЬСЬКОГО МАСИВУ КАРПАТСЬКОГО БІОСФЕРНОГО ЗАПОВІДНИКА

Постоялкін С.В.

Під час вивчення ліхенофлори проведено екотопологічну диференціацію рідкісних лишайників. Окремо виділено екотопи, що потребують охорони та моніторингу як локалітети рідкісних та зникаючих видів, які входять до раритетного генофонду ліхенофлори України. З ідентифікованих видів 33 зростали на пробних площах, 19 видів - в зоні антропогенних ландшафтів.

## FUNGAL INFECTIONS OF BREWING BARLEY IN UKRAINE

**Prilutsky O., Akulov O.**
*V.N. Karasin National University, Kharkiv, Ukraine*
E-mail: oleg_pril@yahoo.com

During cultivation and storage summer barley is often colonized by different microscopic fungi. Lots of them are known as producers of dangerous mycotoxins therefore can represent significant health hazard for the human being. Because of that, in November 2005 the analysis of 86 brewing barley samples from different regions of Ukraine was realized. For carrying out of researches we used standard microbiological methods of the analysis: a method of the moist chamber, crop of spore suspension from a seeds surface and putting of superficially sterilized seeds on a nutrient agar in Petri dishes.

As a result of analysis the 22 species of seed associated pathogenic and saprotrophic fungi were founded out. In particular, it has been established that seeds are strongly infected by *Alternaria alternata* (Fr.: Fr.) Keissl. Contamination of the

investigated seeds parties varied within 24 - 70 %. It is necessary to note, that *A. alternata* is a producer of some dangerous toxins: tenuasic acid, alternariol, monomethil ether of alternariol, altenuel and alterotoxins I, II and III.

The analyzed seeds also have been infected by different helminthosporiosis agents. In particular, *Bipolaris sorokiniana* (Sacc. in Sorokin) Shoem. has infected 23 - 95 % of investigated seeds parties; *Drechslera teres* (Sacc.) Shoem. - up to 15,8 %, *D. graminea* (Rabenh. ex Schltdl.) Shoem. - up to 5,1 %.

The investigated seeds have been substantially infected by *Fusarium* spp.: *Fusarium moniliforme* J.Sheld. - (up to 87.8 %), *F. culmorum* (W.G. Sm.) Sacc. - (up to 57.6 %), *F. oxysporum* Schlecht - (up to 45.5 %). These fungi are known as very dangerous mycotoxins producers (moniliformin, fumonisin B1, zearalenone, fusariocin A etc.).

Also some saprotrophic fungi were registered: *Aspergillus clavatus* Desm., *A. flavus* Link, *A. fumigatus* Fresen. and *A. parasiticus* Speare - (all species up to 3 %). All of them also are producers of dangerous mycotoxins: aflatoxins, patulin, cytochalasin E, sterigmatotoxin etc. Another saprotrophic fungi (*Mucor elegans* Eidam., *Penicillium verticillatum* Corda, *Rhizopus stolonifer* var. *stolonifer* (Ehrenb.) Vuill. and red yeast *Rhodomyces dendrorhous* F. Ludw.), which were found out in tested barley seeds represent considerably smaller danger for brewing industry.

As a result of work we can postulate that set of investigated barley samples is significantly infected by various fungi and is not recommended for using in brewing industry.

ГРИБНА ІНФЕКЦІЯ ПИВОВАРНОГО ЯЧМЕНЮ В УКРАЇНІ

Прилуцький О., Акулов О.

Проведено експертизу 86 проб зерна пивоварного ячменю з різних господарств України. Досліджено видовий склад та ступінь контамінації насіння мікроміцетами. Показано потенційну небезпечність більшості досліджених проб для здоров'я людини.

## THE GENUS *PHOLIOTINA* FAYOD IN UKRAINE

**Prydiuk M.**
*M.G Kholodny Institute of Botany, Kyiv, Ukraine*
E-mail: prydiuk@gmail.com

*Pholiotina* Fayod is a genus of the family Bolbitiaceae (Agaricales) which unites small mushrooms growing on soil, litter, humus, dung, and small pieces of wood. Most of them have no practical importance but some species (for example *Pholiotina cyanopus* (G.F. Atk.) Singer) possesses psilocybin (Arnolds 2005) and in carpophores of *P. filaris* (Fr.) Singer amatoxins were recorded (Brady et al. 1975). The genus is divided into three sections: *Pholiotina* (veil leaving a membranaceous, fugacious annulus on the stipe, accidentally sometimes in thick flocks adhering to pileus margin; pileocystidia absent or scarce); Vestitae Watling (veil present, leaving flocks along margin of pileus; pileocystidia absent or scarce) and *Piliferae* (Kühner) Singer (basidiocarp without veil; pileocystidia usually present and well-developed) (Arnolds 2005). For a long time mycologists discussed whether the genus *Pholiotina* was a part of the genus *Conocybe* Fayod (Watling 1982, 1992) or represented a separate genus (Singer 1950, 1975; Kühner and Romagnesi 1953; Moser 1983). Both genera show much similarity in their morphology, however, recent molecular research confirmed the second opinion (Moncalvo et al. 2002): within the Bolbitiaceae a conocyboid clade (the genera *Conocybe* and *Gastrocybe* Watling) and a bolbitioid one (*Bolbitius* Fr. and *Pholiotina*) have been recognised. Partly therefore in most modern works (Arnolds 2005, Hausknecht 2005) these genera are treated as independent ones.

Both *Pholiotina* and other species of the family Bolbitiaceae rarely attracted attention of mycologists in Ukraine. As a rule, these species were mentioned only in general floristic lists of mushrooms of this country. To date, only 7 species of this genus were known from the territory of Ukraine: *Pholiotina arrhenii* (Fr.) Singer, *P. teneroides* (J.E. Lange) Singer and *P. vexans* (P.D. Orton) Bon (section Pholiotina), *P. brunnea* (Watling) Singer and *P. velata* (Velen.) Hauskn. (section Vestitae), as well as *P. coprophila* (Kühner) Singer and *P. pygmaeoaffinis* (Fr.) Singer (section Piliferae) (Bobyak 1907, Pilát 1940, Zerova 1956, Wasser and Soldatova 1977, Zerova et al. 1979, Moser 1993, Besedina 1998, Prydiuk 2003a, 2003b). During the last five years, as result of my investigations, 6 more species of this genus were collected: *Pholiotina aberrans* (Kühner) Singer, *P. cyanopus* and *P. mairei* (Watling) Enderle (section Piliferae), *P. filaris* (section Pholiotina), *P. dasypus* (Romagn.) P.-A. Moreau and *P. vestita* (Fr.) Singer (section Vestitae). Thus, there are 13 species of the genus *Pholiotina* in Ukraine now, but new records of representatives of this genus are very probable.

РІД PHOLIOTINA FAYOD В УКРАЇНІ

Придюк М.П.

В роботі розповідається про рід *Pholiotina* (Bolbitiaceae, Agaricales) та стан його вивченості в Україні. Названі як раніше відомі (*P. arrhenii*, *P. brunnea*, *P. coprophila*, *P. pygmaeoaffinis*, *P. teneroides*, *P. velata*, *P. vexans*) так і недавно виявлені в результаті досліджень автора (*P. aberrans*, *P. cyanopus*, *P. dasypus*, *P. filaris*, *P. mairei*, *P. vestita* ) представники роду.

## MYCOTROPHIC LINKS INVESTIGATION ON FORMING PHYTOCENOSIS OF NIZHNAYA TURA ELECTRICITY PLANT ASH DUMPS

**Rakov E.A.**
*Ural state university, Ekaterinsburg, Russian Federation*
E-mail: evgeniy-rakov@mail.ru

Consortive links of plants and fungi are demonstrations of forming functional associations in developing phytocenosis of ash dumps. Mycorhyza increases completeness of biogeocenosis, and its stability (Makhnev, 2002).

Investigation, described in this article, was made on different age ash dumps nearby Nizhnaya Tura, Sverdlovsk region, Russian federation. Ash dump №2 is 35 years, ash dump №3 is 15 years. These dumps consist of ash, got from coal burning.

There were recultivation activities on ash dump №2 (works with covering layer of soil). Ash dump №3 goes with self overgrowing, and can be characterized as overhumid. Mycotrophic study was made on 40 species of plants (20 species on each ash dump).

Collecting and analyzing of material were made according to Selivanov methodic (1981). Young roots of every species were taken in ten examples, boiled in alkali and colored by blue-methyl-solution. After that colour was fixed in lactic acid. Root preparations were studied with microscope (100 looks for each species). Author pointed mycotrophic frequency, mycotrophic value and coefficient of mycotrophic infection intensity.

According to mycotrophic value plants are divided into 3 groups (Selivanov, 1973): high mycotrophic - 3.6-5 points; middle mycotrophic - 1.8-3.5; little mycotrophic - 0.1-1.7.

Our study showed, that a half of species amount from ash dump №2 is mycotrophic. But all studied species on ash dump №3 are mycotrophic (19 species are little mycotrophic and 1 species is middle mycotrophic). All values of plants on ash dump №3 are higher then the same values of old dump plants.

It is known that great role of plant-fungus links forming belongs to bioecological peculiarities of plants. A cereal studying has such information (Selivanov, 1970): xerophytes, mesophytes, hygrophytes have different mycotrophyc numbers. Our study showed that mesoxerophytes have the most intensive values on the ash dump №2; and mesophytes have highest values on the ash dump №3. Humid conditions of ash dump №3 cause growth of humid location plants.

ИССЛЕДОВАНИЕ МИКОТРОФНЫХ СВЯЗЕЙ В ФОРМИРУЮЩИХСЯ ФИТОЦЕНОЗАХ РАЗНОВОЗРАСТНЫХ ЗОЛООТВАЛОВ НИЖНЕТУРИНСКОЙ ГРЭС (НТГРЭС)

Раков Е.А.

В работе исследованы некоторые особенности формирующихся фитоценозов на нарушенных землях - микотрофные связи высших растений.

## EVALUATION OF INFLUENCE OF A 3-AMINO-1,2,4-TRIAZOLE ON DEVELOPMENT OF THE CAUSAL ORGANISM OF WHEAT POWDERY MILDEW WITH SCANNING ELECTRON MICROSCOPY

**Ryabchenko A.S., Avetisyan G.A.**

*N.V. Tsitsin Main botanical garden RAS, Moscow, Russia*

E-mail: marchellos@yandex.ru

Effects of an inhibitor of a peroxidase and a catalase of a 3-amino-1,2,4-triazole (3-ATA) on development of powdery mildew pathogen *Erysiphe graminis* f.sp. *tritici* on a wheat-Aegilops line 56/99i were investigated with methods of scanning electron microscopy. Infected detached leaves were incubated in Petri dishes adaxial side up on 3-ATA solutions in concentration 2-50 mM during 1-3 d. In the control used distilled water. The samples for SEM were fixed with glutaraldehyde and postfixed in 2% osmium tetroxide, dehydrated in graded alcohols, critical point-dried with CO2 and coated with gold. The specimens were examined in a LEO-1430 VP scanning electron microscope (Carl Zeiss, Germany). Fragments of leaves were harvested at 48 and 68 hours post inoculation.

Conidia of the pathogen were germinated on a surface of wheat leaves with formation of primary growth tubes and appressoria. After 48 h of incubation 10-20 % of conidia developed normal colonies. After 68 hours a typical colony had from 5 up to 10 hyphae about 50-100 mkm in length. At concentration of 50 mM 3-ATA the quantity of germinated conidia were similarly as control, and the quantity of ungerminated conidia were 3 times more than in control samples, thus development of colonies of a powdery mildew practically was completely inhibited. The number of colonies at concentration 10 mM was 10 times lower than that in the control and the quantity of germinated and the ungerminated conidia 3 and 13 times exceeded control. After treatment with 2 mM 3-ATA 2 and 5 times more germinated and ungerminated conidia accordingly were observed. The similar results were obtained in experiments with nonfixed detached leaves and a low vacuum (VP mode) scanning microscopy. So the more simple methods without difficult sample processing were also effective. The data obtained both with fixed and nonfixed material show the important role of active oxygen species in powdery mildew pathogenesis. Our results demonstrate practicability of utilization of nonfixed samples for investigations of plant pathogens development.

**This study was supported by Russian Foundation for Basic Research, grant № 05-04-48402.**

ИСПОЛЬЗОВАНИЕ СКАНИРУЮЩЕЙ ЭЛЕКТРОННОЙ МИКРОСКОПИИ ДЛЯ ОЦЕНКИ ВЛИЯНИЯ 3-АМИНО-1,2,4-ТРИАЗОЛА НА РАЗВИТИЕ МУЧНИСТОЙ РОСЫ ПШЕНИЦЫ

Рябченко А.С., Аветисян Г.А.

Методом сканирующей электронной микроскопии проводились исследования влияния ингибитора пероксидазы и каталазы 3-амино-1,2,4-триазола (3-АТА) на развитие мучнисторосяного патогена *Erysiphe graminis* f.sp. *tritici* на пшенично-эгилопсной линии 56/99i. Полученные результаты свидетельствуют о важной роли активных форм кислорода в патогенезе мучнистой росы.

## THE MACROMYCETES TROPHIC STRUCTURE PECULIARITIES IN «SREDNYAYA PRIPYAT'» WILDLIFE SANCTUARY OAK FORESTS

**Shaparava Ya.**

*V.F. Kuprevich Institute of Experimental Botany of NAS of Belarus, Minsk, Belarus*

E-mail: Shaparava@yandex.ru

There is a territory of "Srednyaya Pripyat"" wildlife sanctuary in a subzone of deciduous-pine forests of Pinsk-Pripyat' geobotanical area. Natural alluvial landscape areas are concentrated on the given area of a bottomland of Pripyat'. They are most major both on terrain of Byelorussia and in Europe as a whole and therefore have international significance for a biodiversity conservation. One of distinguishing characteristic of the bottomland area is presence here of the large ancient

lake-shaped expansion annually flooded by high waters. The originality of woods of "Srednyaya Pripyat"" wildlife sanctuary is determined by oak-woods. The specific diversity of mycobiota of oak-wood different plots varies from several tens up to several hundreds. It is determined by series of factors, from which biotopical heterogeneity of a plot, its area, aspects and intensity of economic use (cutting, a recreation, etc.), and also an ecological condition of cenosises are principal. Under consideration oak forests, in the mycological plan, are rather weakly investigated, as the long period (in separate years) prior to the beginning of July they are filled by water. Development of mycothalluses as a rule starts in the early autumn after dry summer when sinking of the ground waters is observed.

Under consideration oak forests in the mycological attitude are most affluent on a species composition macromycetes, and, in particular, on mycorrhiza-formative (more than 60 %). In oak forests of a central part of republic saprotrophes are dominantes (Gapienko, 1984). Investigated masses are located on depressions (near to former riverbed, etc.). Intensifying mycorrhiza-formative in such oak forests, in connection by a depletion of soil of these localities by elements of a mineral nutrition and the under level pH, that frames the favourable conditions for development of a mycelium of the majority of macromycetes by this trophic group. The basic mycological appearance of the terraced oak forests is formed by representatives of macromycetes of orders Agaricales, Boletales and Russulales. Humic and covering saprotrophs compose approximately 12% from total quantity of all species. However for them the highest sociability and an abundance is characteristic. The major quantity of species introduces group xylotroph developing both on brushwood and stumps, and on alive, but the weakened trees of oaks (about 25%).

On probed area the determination of three aspects brought in in the third issuing the Red Data Book of Byelorussia is marked: *Lepista sordida* (Fr.) Singer, *Fistulina hepatica* (Schaeff.: Fr.) Fr., *Ganoderma lucidum* (Fr.) P. Karst.

ОСОБЕННОСТИ ТРОФИЧЕСКОЙ СТРУКТУРЫ МАКРОМИЦЕТОВ ДУБРАВ ЗАКАЗНИКА «СРЕДНЯЯ ПРИПЯТЬ»

Шапорова Я.А.

В дубравах заказника «Средняя Припять» доминирующей трофической группой являются агарикоидные макромицеты (более 60 %). Гумусовые и подстилочные сапротрофы составляют примерно 12%, ксилотрофы около 25%.

## EVALUATION OF GRAPE VARIETIES RESISTANCE TO FUNGI DISEASES

**Shykhlinski H.M.**

*Genetic Resources Institute of ANAS, Baki, Azerbaijan*

One can note mildew (*Plasmopara viticola* Berl et de Toni), oidium (*Uncinula necator* Burrill.), grey rot (*Botrytis cinerea* Pers.) and anthracnose (*Gloeosporium ampelophagum* Sacc.) of the most harmful and nocuous fungus diseases of grape in the Azerbaijan environment.

Phytopathologic evaluation of more than 200 collection varieties and forms of grape was carried out on the purpose of study of their tolerance to main fungus diseases in the Tovus Base Station of Azerbaijan Repablik. The evaluation of resistance grape varieties and forms was carried out on a natural background on a five-ball scale (Nedov, 1985; Voitovich, 1987).

As a result of a phytopathologic evalution to mildew (leaves and bunches) it has been reveoled, that in natural environmental condition 12 of 217 varieties and forms of grape were - immune, 1 -resistant, 23 - tolerant, 148 - sensitive and 33 varieties - high sensitive. The phytopathologic evaluation of resistance of grape varieties and forms to oidium (leaves and bunches) has shown that 12 varieties are immune, 3 - are resistant, 26 - are tolerant, 107 - sensitive and 69 - are high sensitive. The phitopathologic evaluation of resistance to grey rot (berries and bunches) in natural enveronmental conditions has shown that 12 varieties were found immune, 22 -resistant, 151 - tolerant and 32 - sensitive. Phytopathologic evaluation of resistance to anthracnose (leaves and bunches) on a natural environmetal background 12 varieties were immune, 45 -resistant, 154 - tolerant and 6 - sensitive.

As a result of research it has been revealed, that the American grape species turned out immune to aforesaid diseases. The varieties grapes concerning to the Euroasian species, have shown a various level of resistance to the above-stated diseases.

ОЦЕНКА УСТОЙЧИВОСТИ СОРТОВ ВИНОГРАДА К ГРИБНЫМ БОЛЕЗНЯМ

Шихлинский Г.М.

В условиях Азербайджана на естественном фоне проводилась фитопатологическая оценка более 200 сортов и форм винограда к основным грибным болезням (милдьюм, оидиум, серая гниль, антракноз). В результате исследования были выделены устойчивые и толерантные к болезням сорта и формы винограда.

## PREDICTION OF THE EFFICIENCY OF LONG-TERM APPLE FRUIT STORAGE BASED ON BIOLOGICAL PECULIARITIES OF MYCOPATHOGENES

**Skripnikova E.**

*I.V. Michurin All-Russian Research Institute of Horticulture, Michurinsk, Russia*

E-mail: elena.sk@mail.ru

Such fungal diseases as monilia, blue mold, gray mold wilt, bitter rot, scab, Alternaria spot, Fusarium rot, Phoma fruit spot, kernel rot were recorded during long-term storage. Harmfulness of some diseases depends on variety and biological peculiarities of fruit, growing location, climatic factors.

Such genera as *Monilia*, *Penicillium*, *Botrytis*, *Gloesporium*, *Alternaria*, *Phoma*, *Cladosporium*, *Fusarium*, *Venturia* are considered to be the main causative agents spread in central Russia. *Penicillium expansum*, *Botrytis cinerea*, *Alternaria alternate*, *Gloeosporium fructigenum*, *Venturia inaequalis* are the most aggressive ones.

Complex system of relationship between pathogen and host results in the development of fungal diseases. Apples fully meet requirements of mycopathogenes in nutrients that are mostly secondary nonspecific necrotrophs. Understanding biological peculiarities of fungi is a background for prediction of mycoinfection development in storage and efficient control.

Optimum hydro and thermal factors required for mass sporification have been established in the orchard. They are specific for each fungous, all secondary necrotrophs however are characterized by a wide temperature range for spore germination. Some species with dark-colored mycelium tolerate air drought without any evident loss of viability.

Mycosis infection of fruit can be predicted by spore saturating orchard air. Therefore the terms of protective and fungicide treatments should be established considering dynamics of spore population.

ПРОГНОЗИРОВАНИЕ ЭФФЕКТИВНОСТИ ДЛИТЕЛЬНОГО ХРАНЕНИЯ ПЛОДОВ ЯБЛОНИ НА ОСНОВЕ УЧЕТА БИОЛОГИЧЕСКИХ ОСОБЕННОСТЕЙ МИКОПАТОГЕНОВ

Скрипникова Е.В.

Для прогнозирования развития инфекционных болезней хранения и успешной борьбы с ними необходимо учитывать биологические особенности грибов-фитопатогенов. Важным показателем прогноза развития болезней является насыщение воздуха сада спорами грибов, которое зависит от гидротермических условий выращивания плодов и применяемых систем защиты.

## THE PRODUCTS OF VITAL FUNCTIONS OF THE GREY MOULD AGENT AS A SELECTIVE FACTOR FOR THE RESISTANT SAMPLES OF TOMATO

**Stadnichenko M., Polyksenova V.**

*Belarusian State University, Minsk, Belarus*

E-mail: stadnichenko_m@list.ru

The results of the researches conducted on the territory of Belarus show that the last years are characterized by considerable changes of the phytopathological situation. The injuriousness of widely specialized parasites, that parasitize on a large number of plants and affect different tissues and organs, has increased. The grey mould agent micromycet Botrytis cinerea Pers. belongs to this group. It possesses a wide set of enzymes which allows this fungus to change quickly under the influence of environment factors and easily adapts to different power supplies. The pathogen excretes substances of various nature which kill and destroy the cells during the fungus migrating into the plant. The disease agent is also capable to synthesize toxic substances in the Capek's liquid culture. Taking into consideration the specificity of mutual relations between a fungus and a plant-host it was decided to study the influence of the grey mould agent metabolites on tomato gametophyte (pollen) and sporophyte (seeds).

The research included the following stages:

1. Derivation of *B. cinerea* monosporous isolate and diagnostics of the filtrates for phytotoxicity,
2. Selection of the initial concentration for primary plating in the liquid culture and the terms of cultivation of the disease agent slip,
3. Differentiation of the tomato samples by the sporophyte and gametophyte reaction on the pathogen toxic filtrate.

The studying of the seeds and pollen germination, the diagnostics of the intensity of the tomato underground and ground parts' growth processes, the measuring of the pollen tube growth under the influence of the fungus metabolite have shown that the population of the grey mould agent is polymorphic on the basis of toxin production. The complex of the toxic products of the botrytiosis agent's vital functions exercise selective inhibition on the seeds and pollen germination of various samples of tomato; this allows using the fungus *B. cinerea* metabolite influence for the selection material estimation by the level of botrytiosis resistance.

ПРОДУКТЫ ЖИЗНЕДЕЯТЕЛЬНОСТИ ВОЗБУДИТЕЛЯ СЕРОЙ ГНИЛИ КАК ФАКТОР ОТБОРА УСТОЙЧИВЫХ ОБРАЗЦОВ ТОМАТА

Стадниченко М.А., Поликсенова В.Д.

Возбудитель серой гнили (*Botrytis cinerea* Pers.) характеризуется широким внутривидовым разнообразием и фитотоксичной активностью по отношению к томату. Комплекс токсичных метаболитов оказывает избирательное ингибирование на прорастание семян и пыльцы, что позволяет использовать их для оценки селекционного материала по уровню ботритиозоустойчивости.

## TO LICHEN'S FLORA OF GOMEL DISTRICT

**Tsurikov A., Khramchenkova O.**

*F. Skoryna Gomel State University, Gomel, Belarus*

E-mail: tsurikov@front.ru

The lichen's flora of Gomel district is studied very nonuniformly. The maiden items of information about Gomel Polesye flora's structure concern to a start of XX century (Lubitskaya, 1914). The flora of National park "Pripyatsky" was studied in 1982 - 1983 by employees of Experimental Botany Institute NASB (Golubkov, 2001). The more integrated analysis of a specific structure of lichen flora of Gomel district is represented actual.

This paper is addition to the earlier published data (Tsurikov, 2005). The field researches were conducted in Gomel city and Gomel, Rechitsa and Buda-Koshelevo regions. Specimens of lichens of Gomel State University Scientific Herbarium of Byelorussian Polesye also were exanimate. Systematic position identifications were conducted in labs of F. Skoryna Gomel State University and Ya. Kupala Grodno State University. Some doubtful specimens made more précised in laboratory of lichenology and briology V.L. Komarov Botanic Institute RAS.

103 species of lichens in 33 genera and 12 families were determined. 3 identified species included in 3-rd issuing of the Red Book of Republic of Belarus. They are *Lobaria pulmonaria* (L.) Hoffm. (VU), *Parmeliopsis hyperopta* (Ach.) Arn. (VU), *Parmotrema stuppeum* (Taylor) Hale (VU). The most number of species belonging to *Cladonia* genera (27), Cladoniaceae. The greatest number of species was folious (44 %). The most widespread group is corticolous. Geographical stricture of lichen flora is described as boreal-nemoral.

К ФЛОРЕ ЛИШАЙНИКОВ ГОМЕЛЬСКОЙ ОБЛАСТИ

Цуриков А.Г., Храмченкова О.М.

Было определено 103 вида лишайников. 3 вида лишайников включены в 3-е издание Красной книги РБ. Наибольшее число видов лишайников относится к листоватым. По отношению к субстрату ведущее место среди определенных

## LICHENOBIOTA OF THE PARK «KOMAROVO»

**Yatsyna A.P.**

*Belarusian State University, Minsk, Republic of Belarus*

**E-mail: lihenologs84@mail.ru**

The park in the village Komarova is located in the territory of the National park «Narochanski», which has been found in 1999. Studying of lichens was carried out in current 2005 - 2006. The territory of park occupies of 25 hectares. The park in Komarovo was found in the second half of 19 century, presented by three terraces: the bottom terrace has a flat relief with superfluous humidification and contains some ponds. The central terrace contains some buildings, including old manor. Opposite the estate some trees *Larix decidua* Mill. were preserved. The top terrace is built up by residential buildings, the eastern of part the garden is presented by fruit trees: *Malus domestica* Borkh., *Prunus domestica* L., *Pyrus communis* L.. 74 species of the lichens, which refer to 18 families and 36 genuses, are revealed as a result of carried out research in the territory of park. The parameter of regular variety represents of species in a genus makes 2,05 in average. Orders Lecanorales (54 species) leads on number among other orders which is 73% out of a total lichens. The largest family is Physciaceae - 14 species (19,1%). Further follow families Parmeliaceae that contains 13 species (17,5%), families Lecanoraceae and Teloschistaceae are presented by 9 species. Four families contain 45 species (60,8 %) in the sum. The greatest number of species contains the following genuses: *Lecanora* (8 species), *Physcia* (5), *Caloplaca* (5), *Physconia* (4), *Ramalina* (4), *Xanthoria* (4). On the whole in the territory of park lichenobiota is presented by the basic genuses and kinds widely spread on the territories of republic parks (Yatsyna, 2005). Among lichens foliose forms prevail - 34 species (46%), crustose - 31 species (41,9 %), bushy - 9 species (12,1%). The biggest part of lichens 59 species (79,7 %) is met on a bark of trees. Lichens are collected on 18 species of trees. 6 species (8,1%) have been collected on a stony substratum - granite boulders (but in individual copies). A special group is represented by the lichens settling on artificial substrata - 10 species (13,5 %), among them the most often met are: *Candelarialla aurella* (Hoffm.) Zahldr., *Hypogymnia physodes* (L.) Nyl., *Lecanora crenulata* (Dicks) Hook.. One species is found on the soil - *Peltigera malacea* (Ach.) Funsk.

Yatsyna A.P. Lichenobiota of the park «Stankovo» // Fungi natural and anthropogenic ecosystems: Proceedings of the international conference dedicated to the centenary of the beginning by professor A.S. Bondartsev his research activity at the V.L. Komarov Botanical Institute RAS (24-28 April, 2005, Saint Petersburg). Vol. 2. St. - Petersburg, 2005. p. 347 - 350.

ЛИХЕНОБИОТА ПАРКА КОМАРОВО

Яцына А.П.

В течении 2005 -2006 года изучен видовой состав лишайников усадебного парка Комарова. В единичных экземплярах собраны *Aspicilia cinerea* Körb., *Chaenotheca furfuracea* (L.) Ach., *Lecanora varia* (Ehrh.) Ach., *Peltigera malacea* (Ach.) Funck., *Usnea hirta* (L.) Wigg., *Xanthoria candelaria* (L.) Th. Fr.

## THE INFLUENCE OF DIFFERENT AGROSTIMULIN CONCENTRATIONS ON PROTEOLYTIC ACTIVITY OF *IRPEX LACTEUS* FR. STRAINS

**Zagnitko J., Manuylova J.**

*Donetsk National University, Donetsk, Ukraine*

Many fungi growth on organic substrates only. Some of authors propose to use regulators of plant growth as stimulators of enzymes synthesis. It was founded that stimulators of plants growth have activied the cellulase synthesis of some fungi. Gibberellins increase the activity of hydrolytic enzymes.

The influence of different concentrations of agrostimulin on thrombolytic, milk-coagulative and caseinase activity of Irpex lacteus strains are investigated. It was showed that 0,1% agrostimulin concentration stimulates the thrombolytic activity of all researching strains on 5$^{th}$ growth day, except strain D-9. Agrostimulin 0,2% on the 10$^{th}$ experiments day lowed level the thrombolytic activity of all researching strains in compare with the control.

It was founded that the 0,1% agrostimulin concentration inhibited the synthesis of milk-coagulative enzymes on the 5$^{th}$ growth day (strain D-9), on the 10$^{th}$ experiments day (strains D-1 and D-8). The 0,2% agrostimulin concentration increased milk-coagulative activity of all investigating strains on 5$^{th}$ growth day, but it lowed enzymes activity on 10-15$^{th}$ growth days. The inhibitive influence of 0,4% agrostimulin concentration on milk-coagulative enzymes synthesis of strains D-8, D-9 are established on 5$^{th}$ growth day. The positive influence of this concentration in all other experiment are found in exponential growth.

The all investigating agrostimulin concentrations have increased the caseinase activity of all I. lacteus strains, except the agrostimulin 0,2%. It's inhibited caseinase activity of strains D-2 (5$^{th}$ growth day) and D-8 (10-15$^{th}$ growth day).

ВЛИЯНИЕ РАЗЛИЧНЫХ КОНЦЕНТРАЦИЙ АГРОСТИМУЛИНА НА ПРОТЕОЛИТИЧЕСКУЮ АКТИВНОСТЬ ШТАММОВ *IRPEX LACTEUS* FR.

Загнитко Ю.П., Мануйлова Ю.А.

Показано, что для повышения выхода ферментов тромболитического действия лучше всего использовать агростимулин в концентрациях 0,1 и 0,4% (для штаммов Д-1, Д-2); ферментов молокосвертывающего действия - 0,2 и 0,4% агростимулин (в экспоненциальной фазе роста); казеинолитических ферментов - 0,1 и 0,4% агростимулин.