

FACULTY OF BIOLOGY AND BIOTECHNOLOGY FOR IMPLEMENTATION

SDG 15 « LIFE ON LAND»

THE MAIN OBJECTIVES FOR ACHIEVING THE SDG

- **Providing quality education**
- **Promotion of environmental literacy and responsible attitude to the nature**
- **Promotion of biodiversity conservation and restoration of environmental objects**
- **Promoting the principles of green economy**
- **Popularization of rational waste disposal**

LANDSCAPING OF THE CAMPUS

The reduction of forest lands, soil degradation in arid regions and loss of biodiversity are the global problem. The UN calls on countries to preserve forests and biodiversity, more rational use of terrestrial ecosystems. The Faculty of Biology and Biotechnology implements programs in the field of ecology, conducts research on the terrestrial ecosystem in order to further protect, restore and promote their further rational use. The faculty supports ecosystems, related to the university, deals with their rational use, implements measures to stop the process of land degradation and loss of biological diversity. Thus, the Faculty of Biology and Biotechnology pursues a policy for the conservation and restoration of terrestrial ecosystems adjacent to the university buildings and the park, in the form of surveys of green spaces (detailed study of the main species of trees, shrubs and soil cover). Phytopathological studies of plantings on the territory of the university are conducted annually in order to develop environmental measures. The university conducts activities to identify and preserve plants listed in the Red Book.

In order to improve the plantings on the territory of the university, sanitary felling of trees, crushing of stumps, as well as planting of young seedlings (common pine, prickly spruce, fir, thuja, apple trees) are carried out. Park paths are being repaired, places for recreation are being arranged. Trees are planted to preserve the historical value of the landscape. So, two years ago, on the Day of Science Workers, the faculty organized the planting of apple seedlings of the «Sievers» variety. The event was held jointly with the ECOJER Environmental Association and the Alma Qala Civil Initiative movement, whose founder Yerlan Stambekov, in his speech expressed great gratitude to the university «for supporting and providing a location for planting fruit trees that are on the verge of extinction and are listed in the Red Book of Kazakhstan».



«Sievers» apple trees are distinguished by a variety of shapes, sizes, colors and flavors of fruits. They were planted to a mountainous area from the main botanical garden of Almaty under the guidance of Doctor of Biological Sciences, Professor, academician Aimak Zhangaliev. Experts note that the genetic fund of apples «Sievers», preserved to this day in Kazakhstan, will increase the yield of other varieties of apples and form a stable immunity to various diseases. Also earlier, more than 160 Crimean pines and Altai firs were planted on the KazNU campus.

GREENHOUSE

There is a greenhouse on the campus of Al-Farabi Kazakh National University, where fruit and vegetable crops and ornamental plants are grown using innovative technologies.



The main purpose of the greenhouse complex of the university is to create conditions for conducting scientific research in a greenhouse in combination with the practice of theoretical knowledge of students majoring in Biology. In the greenhouse complex, various types and varieties

of plants are grown and studied throughout the year. Also, the greenhouse complex is the most convenient place for conducting scientific research and experiments necessary for writing theses and master's theses. In the complex, teachers can conduct field and practical seminars and workshops, helping to increase students' interest in growing vegetable crops. In addition, it is possible to grow seedlings of ornamental plants necessary for landscaping the territory of our university. And also to grow various vegetable crops and use them in the university canteen.

AGROBIOCENTER

The Faculty of Biology and Biotechnology is responsible for the work of the Agrobiocenter, the sole center of our university, which conducts agricultural, scientific, technical and research work with industrial practice. The Agrobiocenter is located in the Ili district of Almaty region.



The Agrobiocenter is intended primarily for conducting field practices in biological disciplines and methods of teaching biology. The main purpose of the creation of the Agrobiocenter was to improve the quality of practical training of future specialists in biology and biotechnology. Of course, it is impossible to imagine a full-fledged training of future specialists in the field of biological and environmental education without field training practices in botany, zoology, soil science and soil ecology, genetics, biotechnology, biology teaching methods conducted on the basis of the Agrobiocenter. During the practice, the natural environment and natural objects in their natural environment are comprehensively used for educational and research purposes. Also, the following agricultural crops are grown annually on the basis of the Agrobiostation: potatoes, cabbage, beets, pumpkin, corn, apples, which are then sold at the student fair. The greenhouses also grow a wide variety of flowers used to decorate the university grounds.

WINTER GARDEN

The Winter Garden belongs to the Al-Farabi Kazakh National University, Faculty of Biology and Biotechnology. The garden is located on the fourth floor of the Omirbek Zholdasbekov Palace of Students. The winter garden hosts research works of undergraduates and doctoral students, festive events for students.

Along with ordinary plants, ornamental and exotic plants for export (avocados) are grown in the garden. The presence of 50 exotic plant species in the winter garden, such as dracaena, scheffler, ficus, monstera, avocado, play an important role.

Scheffler is an ornamental deciduous plant. Its main external feature is fingered leaves, such «fingers» can be 7cm or more.

Dracaena is a woody plant, less often represented by shrubs. The tree-like form of representatives of the genus is due to the secondary growth of the stem. Some species have been used since ancient times as a source of so-called «dragon blood». Some representatives of the genus are popular greenhouse and indoor plants.

Ficus belongs to the evergreen ornamental-leaf plant species of the Mulberry family. Indoor ficus species are used as decorative plants for landscaping. The leaves are alternate, less often opposite, toothed and lobed.

Monstera is an evergreen vine with large- up to 45 cm- carved leaves. Monsters are unpretentious and even at home can grow up to several meters in length. The leaves are pinnately dissected. *Monstera alba* is a large brightly colored tropical flowering plant.

Avocado is a fast-growing tree, reaching a height of 20 m. The trunk is usually straight, strongly branching. The leaves are elliptical, reach 35 cm in length, fall off all year round. The flowers are nondescript, small, greenish, located in the axils of the leaves.





AQUARIUM LABORATORY




The Aquarium Laboratory of the Department of Biodiversity and Bioresources has existed at the Faculty of Biology and Biotechnology of Al-Farabi Kazakh National University for more than 40 years since 1979. During this time, a lot of experience has been accumulated in the maintenance and breeding of many species of aquarium fish, but work on the maintenance of local species has begun relatively recently. The aquarium complex is equipped with systems of small aquariums that allow conducting research with objects of warm-water and cold-water fish farming, as well as other objects of aquaculture in the following areas: assessment of the physiological state of organisms (growth rate, development characteristics, nutrition, behavioral reactions, resistance to adverse environmental factors, susceptibility to infectious agents, immunity indicators, etc.); assessment of growing conditions and development of optimal technologies for specific types of aquaculture. The peculiarity and problem of keeping local fish species in aquariums is their selectivity to the temperature and purity of the water.



Currently, the laboratory is working out methods of keeping 4 endangered fish species endemic to the Balkhash basin in captivity – these are the Balkhash marinka *Schizothorax argentatus*, the Semirechensk minnow *Phoxinus brachyurus* and the Severtsov char *Triplophysa sewerzowi*.

Until the mid-1970s of the last century, the Balkhash marinka was one of the most important objects of fishing – up to three thousand tons of this fish were produced per year. The average weight of fish in catches was about 1.5-2 kg, and the maximum was about 10 kg. Dried marinka meat (balyk) was valued on a par with sturgeon. However, the irrational organization of fishing and the introduction of alien fish species led to a rapid reduction in the number and range of this species. In recent years, the Balkhash marinka is increasingly rare in the vicinity of the city of Almaty, where not only amateur fishermen, but also poachers are trying to get these fish. In the aquarium laboratory of the Department of Biodiversity and Bioresources, a small flock of this species has existed for more than 5 years.

The Semirechensk minnow is a small fish no more than 8 cm long, usually much smaller. This species was first described in 1912 by the great Soviet scientist Lev Semenovich Berg from several specimens caught in springs near the village of Chilik. In the past, the Semirechensk minnow was widespread in the Balkhash basin, where it inhabited springs, small rivers and lakes. This species performs a very important ecosystem role, eating a large number of mosquito larvae. However, other information on its biology is extremely scarce. We managed to obtain the offspring of this species in captivity, but it is too early to talk about sustainable reproduction.

	<p>Balkhash marinka (<i>Schizothorax argentatus</i>)</p>
	<p>Semirechensk minnow (<i>Phoxinus brachyurus</i>)</p>
	<p>The Severtsov char (<i>Triplophysa sewerzowi</i>)</p>

The Severtsov char is one of the smallest fish in Central Asia. The length of adult fish rarely reaches 5 cm. The species was discovered and described by the outstanding Soviet ichthyologist Georgy Vasilyevich Nikolsky in 1937 from the Ili River basin. The biology of this species has not been studied at all. Due to the fact that the Severtsov char has become extremely rare in the natural environment, the aquarium laboratory contains only a few specimens. Observations in the aquarium should help to understand the biological characteristics of this species in order to develop recommendations for the effective conservation of its natural habitat.

The work on the maintenance of native fish species in aquariums is not only of great practical and scientific importance, but also allows students to engage in independent scientific work and educates them to respect their native nature.

BIOBASE

The educational and Scientific Biological Base (NBB) was created as a special division of the Faculty of Biology on the basis of a Letter from Kaz GU (No. 27-740 dated 30.09.77) and an Order of the Ministry of ViSSO of the Kazakh SSR (No.5/1-21-536 dated 12.07.78).

Educational and scientific biological base – is an educational and auxiliary and scientific unit of the Faculty of Biology and Biotechnology of Al-Farabi KazNU.

The tasks of the NBB are determined by the curricula of the departments and scientific laboratories of the faculty, according to the applications submitted and approved by the Dean's office for the required number and types of laboratory animals for the academic year.

NBB employees are engaged in the maintenance, feeding and breeding of laboratory experimental animals, which is carried out in accordance with Sanitary norms and rules approved by the Ministry of Health of the Republic of Kazakhstan and the University Administration. The main objectives of the activity of the biobase are aimed at strengthening the position of the University as the leading scientific and educational complex of the country, corresponding to international standards of scientific research based on the latest achievements in biology.

The main functions of the biobase include:

- 1-Provision of biomaterial for scientific research of a fundamental and applied nature in various areas in biomedicine.
- 2-Material and technical support of educational and scientific processes.
- 3-Equipping the NBB with modern laboratory equipment, breeding of laboratory animal breeds and the use of all resources for educational and research purposes.

SCIENTIFIC PROJECTS OF THE GF

The next step in achieving SDG 15 is research within the framework of grant-funded research projects for the conservation, restoration and rational use of terrestrial and inland freshwater ecosystems and their services, including forests, wetlands, mountains and drylands. Scientific research in the field of protection, restoration and support of ecosystems is carried out on the basis of the Research Institute of Biology and Biotechnology and the Research Institute of Ecology Problems functioning at the Faculty of Biology and Biotechnology of Al-Farabi Kazakh National University.

So, within the framework of the project «**INTRODUCTION OF PERENNIAL WHEAT INTO THE CULTURE OF AGRICULTURE FOR THE CONSERVATION OF BIODIVERSITY AND SOIL FERTILITY IN THE SOUTH AND SOUTH-EAST OF KAZAKHSTAN**» (Head, Doctor of Biological Sciences, Professor M.S. Kurmanbaeva) Research is being conducted on the development of agrobiological foundations for the introduction of perennial wheat into the agricultural culture of the south and south-east of Kazakhstan and the study of its role in increasing the productivity of arable land, reducing greenhouse gas emissions, preserving soil fertility and improving the environment.

As a result of the research, the phenology of development, the accumulation of aboveground and root biomass, the formation of the leaf surface of perennial wheat was determined. To determine the phenology of the development of perennial wheat, the features of the growth and development of perennial wheat were studied in the greenhouses of Al-Farabi KazNU and M.Auezov SKSU, in various agroecological zones of the south in the city of Shymkent and in the Almaty region of the Karasai district of south-east Kazakhstan. Seed germination was determined in laboratory, greenhouse and field conditions. The date of the beginning and full onset of the main phases of

development in the field has been determined. Morphological and anatomical features of perennial wheat have been studied. Optimal terms, methods and norms of sowing perennial wheat have been developed. During the study of the peculiarities of the formation of the yield and the quality of the grain of perennial wheat, the productivity of perennial wheat was determined. The content of protein and gluten in the grain was determined. Basing on the obtained results, a method for cultivating perennial wheat in Kazakhstan has been developed.



A

B

C

Perennial wheat in the flowering phase, A, B - greenhouse of Al-Farabi Kazakh National University, C - greenhouse of South Kazakhstan University of M. Auezov.



The growth of perennial wheat in the field.



Ears measurement of perennial wheat, cm.



According to the project «**COMPREHENSIVE STUDY OF BIORESOURCES OF COMMON REED (*PRAGMITES AUSTRALIS*), ITS ECOSYSTEM SIGNIFICANCE AND THE POTENTIAL FOR SUSTAINABLE USE IN BIOECONOMICS**» (Head – PhD, Professor S.T.Nurtazin), the research is aimed at achieving SDG 12 «Responsible consumption and production» and SDG 15 «Conservation of terrestrial ecosystems». Based on the negative effects of the growth of the world economy on the environment, new approaches have been actively developed in recent decades to obtain materials and energy sources using renewable natural biological resources. This direction is based on the use as raw materials for production purposes, including feed for farm animals and poultry, biogas, etc. This direction, based on the use of biomass as a raw material for the production of biogas, as well as feed for farm animals and birds, has been called «bioeconomics», the goals of which are to maximize the preservation of the natural environment, ecosystems, biodiversity while ensuring economic growth and employment of the population.. The objects of the study were phytocenoses of common reed (*Phragmites australis*) widespread in Kazakhstan, which has a high potential for biomass growth in the warm season (on average 5-10 t/ha, and sometimes up to 30 t/ha).At the same time, reeds usually grow in the floodplain of rivers, on soils with a high level of soil water, in wetlands unsuitable or unsuitable for use for agricultural crops. It should be noted that

Kazakhstan is one of the countries richest in natural resources of common cane in the world. Traditionally, a wide range of economic use of cane has recently expanded significantly. In particular, reed stems are used for the production of cardboard, chipboard, paper and packaging materials, in the synthetic and textile industries, as well as in the production of mats, fences, thatched roofs and building materials. The leaves of young shoots are a useful feed for livestock, as they contain 18-22% crude protein. Reed is also successfully used for phytoremediation in aquatic ecosystems and for the treatment of wastewater systems, hydroponic systems and wetlands. In recent years, there have been many options for using ordinary cane as various innovative types of composite building materials, raw materials for the production of cellulose and naturally decomposed bioplastics, standardized solid fuel briquettes, pharmacological preparations and food additives, feed pellets for livestock, etc. In addition to the above, reed beds provide a wide range of ecosystem services, such as carbon storage, water quality regulation, flood buffering, etc.

Currently, reed beds occupy about 3 million hectares in Kazakhstan. Especially large massifs are noted on the Ili, Shu, Irtysh, Syrdarya, Zhaiyk rivers, as well as on the lakes Balkhash, Tengiz, Zaisan, Sarykop. Reed ecosystems in Kazakhstan provide the greatest biodiversity. We have developed five types of feed concentrate based on common reed (*Phragmites australis*). The main ingredients in our feed concentrates were alfalfa, wheat, corn, sunflower cake, soy meal, etc. The obtained feed concentrates had different indicators of animal edibility (cattle, MS), nutritional value and cost. A patent was obtained for feed pellets based on cane. Work continues to improve the technology of cane silage in combination with various root crops and various types of dry cane mass for the manufacture of fuel pellets and disposable tableware.



Reed ecosystems



Fuel pellets and disposable tableware made of reed

The productivity of the planet's green cover depends on the condition and fertility of the soils, on the resources of which the entire «nutrition pyramid» of the biosphere is built. Their quality is of particular importance for agricultural lands that provide food for the growing population of the planet. The problem of protection and rational use of soils has two main directions: protection of fertility and preservation of productive territories for the needs of agricultural production. The world's population is growing rapidly, and food needs can be met either by increasing yields or by expanding agricultural territories. The reserve of land suitable for agricultural development is almost exhausted. The expansion of arable land is possible mainly due to lands located in the risk zone, where not only biological communities, but also soils are easily destroyed. The effect of involving these lands in economic turnover is small, these lands are short-lived, they easily degrade, losing their natural fertility.

The project «**ASSESSMENT OF THE IMPACT OF MAN-MADE WASTE ON THE PROPERTIES OF SOIL COVERS AND DEVELOPMENT OF A METHOD FOR THE REHABILITATION OF ECOLOGICALLY UNFAVORABLE INDUSTRIAL LANDS**» (Head - Doctor of Biological Sciences, Professor Yessimsitova Z. B.) is aimed at developing a domestic fertilizer «EcoSoil» of plant origin obtained from rice husks, characterized by low addition density and high adsorption capacity. Within the framework of the project, it is planned to analyze the ecology of the soil cover, assess the current physical and chemical state, problems and ways to solve them in the East Kazakhstan, North Kazakhstan and Zhambyl region. Conducting research in the field of protection of rare and endangered plant species, including medicinal plants is one of the priorities in the implementation of SDG 15.

As a result of regular anthropogenic impact on the earth, negative processes are developing in many regions of the Republic of Kazakhstan, affecting the violation of the soil cover, causing over-compaction, chemical and biological pollution and reduction of biodiversity. An increase in the anthropogenic load on the environment leads to the emergence of zones with a critical ecological situation. These problems require comprehensive monitoring of the state of the natural environment, conducting research that allows not only to identify and assess the danger of pollution, but also to establish trends and the speed of changes.



The importance of the problem of soil contamination with chemical elements lies in the fact that soils are a natural accumulator of heavy metals from the environment, which is the main source of pollution. The use of bio-coal from rice husks for remediation of soil covers is an urgent and new direction in the field of increasing crop productivity, obtaining environmentally safe products with significantly lower costs.

Rice husk-based biochar obtained by carbonation has a more developed structure with a larger specific surface area and porosity, which increases its sorption properties. Due to its high porosity in combination with other physicochemical features, biochar contributes to the retention of moisture and useful nutrients in the soil. The novelty of the study lies in the fact that the bio-coal obtained using the optimized method is a new porous material based on a bio-source for the effective removal of heavy metals from the soil cover, which helps to achieve sustainable development goals and improve the policy of the closed-loop economy.

«Zhas galym» project on the topic «**STUDYING THE STATE OF POPULATIONS AND INTRASPECIFIC PHENOTYPIC VARIABILITY OF RARE SPECIES OF MEDICINAL PLANTS FROM THE GENUS ADONIS L. IN NORTHERN KAZAKHSTAN**» (project Manager - Zhmagul M.Zh., PhD) is aimed at studying the current state of the population and intraspecific anatomical and morphological variability of rare species of medicinal plants from the genus *Adonis* in the flora of Northern Kazakhstan and developing measures for their conservation. As a result of processing the material of field research, herbarium funds and literary sources, it was found that 3 independent species of *Adonis* grow in the territory of Northern and Central Kazakhstan in the volume accepted according to the international POWO database: *Adonis vernalis* L., *Adonis volgensis* Steven ex DC. and *Adonis villosa* Ledeb. Populations of *Adonis villosa* Ledeb and *Adonis*

vernalis L. were studied for the first time. Currently, a critical revision of herbarium collections has been carried out in large domestic and foreign herbarium funds, including: the Herbarium of the Institute of Botany and Phytointroduction; the Herbarium of the international scientific and Production holding «Phytochemistry», the Herbarium of the Astana Botanical Garden, the Depository of Living Systems of the Moscow State University «Noah's Ark» (MW) (Seregin, 2020), the Herbarium of Masaryk University.



The data obtained allowed us to establish the species diversity and distribution of *Adonis* in Northern and Central Kazakhstan. Thus, 308 *Adonis* growth sites were identified in these regions. The most common species in the studied region is *Adonis volgensis* Steven ex DC – 210 locations, *Adonis villosa* Ledeb is relatively less common. – 80 locations. Very rarely, *Adonis vernalis* L. is found in the studied region – 27 locations.

TRAINING OF HIGHLY QUALIFIED SPECIALISTS

The main contribution of the Faculty of Biology and Biotechnology of Al-Farabi Kazakh National University to the achievement of SDG 15 «Conservation of terrestrial ecosystems» is the training of highly qualified specialists: biologists, zoologists, geobotanists of the master's and doctoral degree levels, competitive in the domestic and international labor market in the following educational programs: 7M05112 «Geobotany», 6B05102 – «Biology», 6B05102 – «Biology» (NIS), 6B05108 – «Biomedicine», 6B05109 – «Neuroscience», 6B05103 – «Biotechnology», 6B05103 – «Biotechnology» (NIS), 6B05110 – «Zoology», 6B05101 – «Biological Engineering», 6B05107 – «Microbiology», 6B05105 – «Genetics», 6B08401 – «Fisheries and industrial fishing».

In world practice, the training of botanical specialists is determined by the tasks of scientific and industrial activity and the economic needs of the country. In addition to the recommendations of domestic and foreign specialists, based on the experience of training specialists in the field of geobotany, the choice of directions and the list of disciplines is compiled taking into account the applications of the main employers for specialists and priority research in the field of geobotany,

determined by the National Academy of Sciences and the Ministry of Education and Science of the Republic of Kazakhstan for the future and curricula of foreign countries.

The training of specialists in the field of botany in Kazakhstan has been carried out since 1934 at the Al-Farabi Kazakh National University, on the basis of one of the oldest departments of the University, which does not lose its significance and relevance to the present. Geobotany specialists are in demand in akimats, in organizations whose activities are related to the organization of monitoring of plant biological diversity, in the system of the Ministries of Ecology and Health; scientific staff in academic and branch scientific, environmental and environmental institutions, design organizations of biological and agricultural profile, in nature reserves, oil companies, NGOs as experts in design, agricultural reclamation systems, utilities and services dealing with the prevention and control of desertification. Among them, the RSE at the PHW «Institute of Botany and Phytointroduction» of the Forestry and Wildlife Committee of the Ministry of Ecology and Natural Resources of the Republic of Kazakhstan is the main customer, founder and direct active participant in the implementation of highly qualified specialists.

In addition, the following scientific organizations are interested in graduates of geobotanics - Institute of Plant Biology and Biotechnology, Institute of Plant Protection and Quarantine, National Parks, Botanical Gardens, akimats of all levels, etc. For more than 80 years of training of botanists, geobotanists, the department has established itself as a reliable partner of these organizations, making changes to the curriculum of training specialists, according to the requirements of the time and the specializations recommended by employers, and has a huge authority in Kazakhstan and abroad.

Graduates of the EP 6B05110 «Zoology» will possess knowledge and competencies in the field of fundamental and applied zoology and animal ecology and will work in the environmental field as engineers, specialists of the 1st, 2nd category, inspectors, zoo technicians, security engineers, senior inspectors, inspectors and assistant inspectors. During the training, students will undergo practical training on the basis of nature reserves, such as: Aksu-Jabagly, Almaty, Alakol, West Altai, Karatau, Kurgaldzhinsky . Markakolsky, national parks: (Ile-Alatau State National Natural Park, Altyn-Emel Park, Karkarala State National Natural Park, Katon-Karagai National Park, Tarbagatai State National Natural Park) and zoological reserves (Tarbagatai Reserve, Lepsinsky Reserve, Kuludzhunsky Reserve, Andasai Reserve, etc.). Applicants The EP «7M05118 Zoology» is also offered, where undergraduates can specialize in biodiversity conservation and take leading positions in relevant national organizations. The educational program «6B05102 Biology» also has competencies in the relevant field and trains specialists in environmental protection.



Students at the annual field practice

The annual field practice introduces students to various biotopes, allows them to master the methods of field research, learn how to work with determinants, make a list of species and know the

characteristics of individual biotopes, identify the main species of vertebrates and invertebrates of each biotope.

SUMMER SCHOOLS AND THEME NIGHTS

The faculty periodically organizes summer schools, thematic weeks and events dedicated to animal welfare, responsible care for animals, and the preservation of their biodiversity. In 2019 and 2023, Associate Professor of the Department of Biodiversity and Bioresources N.S.Mamilov, together with the Institute of Zoology of the Ministry of Education and Science of the Republic of Kazakhstan and with the support of the German Academic Exchange Agency (DAAD), held summer schools for foreign and local students. All the data obtained by students on the diversity and properties of wild animals and plants are considered from the point of view of biocentrism and ecosystem services. Therefore, this field practice is of great interest for ecologists, zoologists and botanists and for students with a wider range of interests. When conducting field classes, the principle of «do no harm» is observed, which is important for the formation of environmental awareness and understanding of young people. Thus, students assimilate information in two stages: theoretical analysis of the natural characteristics of the territory and the formation of practical skills. The content of the first stage is the assimilation by students of terms, concepts expressing the essence and certain patterns of interaction between man and nature. The second stage is connected with the use of the mentioned terms and concepts in practical actions in the natural environment – excursions and individual classes. The proposed approach allows not only to gain new knowledge, but also to strengthen cultural ties between different peoples. In 2023, we received 36 applications. We selected 15 participants whose specialty most corresponded to the theme of our summer school. Of the 15 selected students, only 13 were able to participate in the summer school. All students arrived at the campus of Al-Farabi Kazakh National University on August 16, then we conducted a tour of the zoological museum and an introductory lecture on the diversity of landscapes and wildlife of Kazakhstan. From August 17 to August 29, the summer school was held at the ornithological station of the Institute of Zoology on the Chokpak Pass (western Tien Shan). This pass is located between the Talas Alatau and Karatau mountain ranges, so birds are forced to make spring and autumn migrations here. At the ornithological station, students gained knowledge about the diversity of ecosystems, fauna and flora of the Western Tien Shan, mastered the skills of setting traps for birds and studying their morphological and biological features. The general direction of the summer school was to get acquainted with the animal and plant world, landscape features of the region, cultural values and mentality of the Kazakh people. In addition to lectures presented by specialists of the University and the Institute of Zoology, a large proportion were guided practical classes. However, the specifics of the hospital and its working environment provided the students with the most ornithological information. After catching the birds, they were delivered to the station, where, under the guidance of specialists, students ringed them, determined their species, gender and age, and then measured wing length, weight, and estimated fat reserves. Separately, lectures were given on the whole about the banding station, about birds of prey, squinters and pigeons, the species diversity of birds of Kazakhstan. The practical - ornithological part included: identification of birds, observation, trapping and banding. Bird sightings were carried out during the routes, at the pass itself, where the flight of birds of prey was mainly monitored, as well as at the Ters-Ashibulak reservoir, where waterfowl and near-water birds became the main object of observation. As a result, about 1,000 birds were caught in two weeks and 53 species from 32 genera, 22 families and 9 orders were identified. The botanical part consisted in collecting and identifying plants typical of the steppes and foothills of Southern Kazakhstan.



Field research in the Ile River Valley



A group of students from Germany at the Department of Biodiversity and Bioresources before going on an excursion

Thematic exhibition "BIOART". The Department of Biodiversity and Bioresources of the Faculty of Biology and Biotechnology together with the Biological Museum of Al-Farabi Kazakh National University in May 2023 held the first exhibition of creative works «BioArt» dedicated to the integrity of a living organism and the environment.

The exhibition was attended by schoolchildren, students of art studios, students, undergraduates, doctoral students and teachers. In total, more than 100 works of art and sculptural

compositions were presented at the exhibition. In their works, the authors presented their views on biological diversity, showed how they represent the planet in the future with favorable and unfavorable developments. In their works, they urge people to take care of nature and its riches. The Grand Prix at the exhibition was awarded to Mikhail Zevako, a 15-year-old contestant representing the UNESCO club's «Star of David» Art Studio, his work «The last dance of nature» fully reflected the concept of the exhibition and showed all facets of the integrity of man and nature: the fragility of relationships and at the same time reliability and support.



«Bioart» exhibition



Handmade by 9th grade student Mikhail Zevako of the ART Studio «Star of David» of the UNESCO club «The last dance of nature»

Guests and participants of the exhibition visited the Biological Museum, an introductory tour of the faculty was conducted for schoolchildren, heads of departments and teachers told about their work and scientific research. The exhibition was held in a relaxed and friendly atmosphere. All participants of the exhibition expressed their wish to continue holding this event, making it an annual event.



Participants and organizers of the thematic exhibition «Bioart»



Participants and visitors of the exhibition of the thematic exhibition «Bioart»

CONFERENCES AND ROUND TABLES

On April 20, 2023, an INTERNATIONAL SCIENTIFIC AND PRACTICAL CONFERENCE within the framework of sustainable development was held, dedicated to the 70th anniversary of the Doctor of Biological Sciences, Professor Tamara Minajevna Shalakhmetova. The issues of biodiversity conservation and ecology were considered at the conference. Air, soil and water pollution, conservation of plant and animal species are an urgent topic at present. In this regard, a large-scale conference in the field of bioecology was held. The issues of biodiversity conservation were considered at the conference. A well-known scientist, Doctor of Biological Sciences, Professor, corresponding member of the National Academy of Sciences of the Higher School of Economics Tamara Minajevna Shalakhmetova, after graduating from the Biological Faculty of the Kirov Kazakh State University, went through a professional and scientific path from senior intern researcher to Dean of the Faculty of Biology and concurrently Director of the DGP Research Institute of Environmental Problems of the Al-Farabi Kazakh National University.

Tamara Minajevna Shalakhmetova is a recognized scientist in the field of cell biology. In 2003, she was elected a member of the Russian International Society for Cell Biology (Institute of Cytology of the Russian Academy of Sciences, St. Petersburg). She was twice awarded the MES RK state scholarship for outstanding achievements in science.

The event brought together prominent scientists, public and state figures, representatives of the leadership, faculty of the university, etc.

At the event, a congratulatory letter from the Chairman of the Board – Rector of Al-Farabi Kazakh National University Zhanseit Tuimebayev was read out with a high assessment of Tamara Shalakhmetova's merits and wishes of success in scientific and pedagogical activities.

During the plenary session of the conference, presentations were made by: Professor of the University of Illinois James Lee, Professor, Academician of the National Academy of Sciences Zulkhair Mansurov, Professor of the Department of Biology of Nazarbayev University Dos Sarbasov, Professor, Laboratory of Human Microbiome, CHU «NLA», Nazarbayev University Almagul Kushugulova, Professor, Director of the Institute of Experimental Biology named after F.M.Mukhamedgaliev Yerzhan Toishibekov et al .



At the conference of T.M. Shalakhmetova - with the staff of the faculty management, April, 2023.



Plenary session of the conference by T.M. Shalakhmetova

Within the framework of the «Sustainable Development Goals-15», on September 22, 2023, an international scientific and practical conference «Problems of desertification of the territory of the Republic of Kazakhstan and ways to solve them» was held at a high level at the Faculty of Biology and Biotechnology of the Al-Farabi Kazakh National University, dedicated to the 80th anniversary of Candidate of Biological Sciences, Associate Professor Abibulla Ametovich Ametov.

At this conference, Chairman of the Board-Rector of Al-Farabi Kazakh National University Tuimebayev Zhanseit Kanseitovich congratulated the owner on the 80th anniversary and awarded the «silver medal of Al-Farabi».

Speakers from Turkey, Russia and many cities of Kazakhstan, in particular from Astana, Aktobe, Aktau, Shymkent and Turkestan, took an active part in the conference and made plenary reports. The event discussed issues of biodiversity conservation, reduction of natural pasture lands, that is, the increase of desert and semi-desert zones. The Main Botanical Garden of Almaty, the Director General of the Institute of Botany and Phytointroduction G. T. Sitpayeva and her teams congratulated Abibulla Ametovich and noted his contribution and merits in the field of botany. Teachers and professors of universities of Almaty, Astana, Shymkent, Aktobe, Aktobe also sent congratulations to the hero of the day.

At the international scientific and practical conference, a library exhibition of the author was organized and the textbook «systematics of higher plants» in volume III was presented. The international scientific and practical conference presented «problems of desertification and ways to solve it», discussed topical issues of increasing the number of geobotanics, as well as the preparation of passports of natural pasture lands.

Students, undergraduates, doctoral students of the university told about their scientific work in the sectional departments, as a result of which they took prizes and were awarded certificates.



Congratulations of A.A.Ametov with anniversary from the staff of the department



Awarding of scholarships to doctoral students and undergraduates of the department during the conference