

Plant Physiology and Biochemistry Department

of V.N. Karazin Kharkov National University is a basic department of the School of Biology – 6.040102, specialties **Plant Physiology and Biochemistry** and **Microbiology and Virology**. The training curriculum includes theoretical subjects in the field of Life Sciences and special courses in plant physiology, biochemistry and biotechnology as well as microbiology and virology. The Department provides training Bachelors, Specialists and Masters in Biology. A particular attention are given to an investigation of plant growth and development control by means of integrated biochemical, physiological, genetic, biotechnological and molecular genetic approaches.

Graduates of Plant Physiology and Biochemistry Department work as scientific collaborators in scientific research organizations and laboratories of biological, medical (clinical, biochemical and bacteriological laboratories), pharmaceutical, agricultural profiles as well as teachers of biological disciplines at Secondary and High Schools.

HISTORY OF THE DEPARTMENT

Plant Physiology and Biochemistry Department is one of the oldest plant physiology schools in Ukraine. The department was founded in 1889 on the initiative of the prominent scientist **Vladimir Ivanovich Palladin** (1859-1922) who set up the Kharkov plant physiology school. During 120 years 15 textbooks and manuals, 12 monographs, more than 900 papers have been published; 800 students including 30 foreign ones have got trained in physiology and biochemistry at the department. Among the graduates of plant physiology and biochemistry department more than 60 graduates became PhD and 20 graduates became professors.

EDUCATION

The department provides teaching of three general courses for students of the School of Biology – **«Plant Anatomy», «Microbiology», «Plant Physiology and Biochemistry»**. 13-15 full-time and external students, 5-7 postgraduate students and applicants for PhD get trained at the department annually. Foreign students from China, Iran and Jordan are getting trained in magistracy (MA course) and a postgraduate course. The Department provides training Bachelors and Masters in the field of Biology with majoring in plant physiology and biochemistry and microbiology and virology.

ACADEMIC DISCIPLINES

«Plant Physiology and Biochemistry» special courses:

- Plant Biochemistry
- Plant Secondary Metabolism and Substances
- Photosynthesis
- Mineral Nutrition with General Soil Microbiology
- Physiology of Flowering
- Physiology of Plant Resistance
- Plant Ecophysiology
- Plant Hormones
- Plant Intracellular Signal Systems
- Special practice “Methods of Plant Cell and Tissue Cultures in vitro”
- Gene Engineering and Plant Biotechnology
- Transgenic Plants and Biosafety
- Systemity of Plant Physiological Functions
- Special Practices in Plant Physiology, Biochemistry and Biotechnology.

«Microbiology and Virology» special courses:

- Industrial Microbiology
- Soil Microbiology
- Microbial and Viral Ecology
- Metabolism of Microorganisms
- Microbial Synthesis
- Biology and Taxonomy of Bacteria Groups
- Biological Nitrogen Fixation
- Medical Microbiology
- Microbial and Viral Genetics
- Plant Viruses
- Scientific Documentation and Standards in Microbiology
- Special practices in Microbiology and Virology

The students carry out their qualifying projects and masters' graduate works on the basis of the department. We have an experimental field plot, “Plant Growth and Development” laboratory, a factorostat chamber for the vegetation experiments, a biotechnological laboratory “Plant Morphogenesis in vitro”, and microbiological laboratory. Also the students carry out their works on the basis of Kharkov research institutes: V.Ya. Yuriev Plant Production Institute of UAAS, National Centre of Plant Genetic Resources of Ukraine, Institute of Cryobiology and Cryomedicine of NAS of Ukraine, Institute of Forestry and Agromelioration of UAAS.

SCIENTIFIC WORK

The field of research of Plant Physiology and Biochemistry department includes:

- ❖ A physiological and genetic relatedness of plant growth and development control;
- ❖ Plant tissues and cell cultures morphogenesis *in vitro*;
- ❖ Physiological and biochemical mechanisms of plant-microbes interactions in different environmental conditions;
- ❖ The mechanisms of the vegetable plants' growth, development and productivity promoting by phytochrome activation;
- ❖ The effects of *Vrn* and *Ppd* genes of soft wheat (*Triticum aestivum* L.) and *E* genes of soya (*Glycine max* (L.) Merr.) on callusogenesis and morphogenesis *in vitro*;
- ❖ An influence of *Vrn* genes of soft wheat (*Triticum aestivum* L.) and *E* genes of soya (*Glycine max* (L.) Merr.) on associative and symbiotic nitrogen fixation respectively.

Furthermore members of the department carry out investigations of physiological and biochemical mechanisms of stress and environmental effects on plant growth and development as well as regularities of microorganism species structure formation in forestry soils. In 2008 International Conference ‘Plant growth and Development Control: physiological, biochemical and genetic aspects’ has been held on the basis of the department. For the last eight years members of the department have defended four PhD theses (PhD in Biology by specialties ‘Plant Physiology’, ‘Botany’ and ‘Biochemistry’) and a doctoral thesis (V.V. Zhmurko). Now at the department there are three post-graduate students and two applicants for PhD in Biology. The department has up-to-date laboratories, several master courses in a foreground field of research closely associated with scientific work of the department and a postgraduate course in Plant Physiology.

STUDENT LIFE

Our students take part in a social life of the department and the University. They participate in the student biological competitions and tournaments; make reports at the student scientific conferences in Ukraine and CIS countries. They took the first places at the Ukrainian contest of the student research works on Biology; they are awarded with the letters of commendation of Ministry of Science and Education of Ukraine, Kharkov Regional Administration, and the University. Some of them obtained a personal scholarship.

SCIENTIFIC COLLECTIONS

A collection of wheat and soybean near isogenic lines. The department stores and keeps up a collection of monogene- and digenedominant *Vrn* (*vernalization*) and *Ppd* (*photoperiod*) near isogenic lines of soft wheat *Triticum aestivum* L., and *EE* near isogenic lines of soya *Glycine max* (L.) Merr. Our collection numbers nearly 42 wheat isogenic lines of 8 cultivars' genofonds, and 13 soybean isogenic lines of 2 cultivars' genofonds.

A collection of microorganisms. The collection numbers nearly 2000 strains of such microorganisms as bacteria, microalgae and microscopic fungi. It continually expands by research workers of the department who isolate new strains of microorganisms from different natural sources and exchange the strains with other collections of microorganisms. For the last years new strains of associative and symbiotic nitrogen fixing bacteria were added to the collection.

These scientific collections of the department enable to carry out fundamental investigations, supply Bachelor and Master courses and also a postgraduate course in Plant Physiology and Microbiology.

PARTNERING

The department closely collaborates with lots of Ukrainian and foreign Universities and research institutes of UAAS and NAS of Ukraine: T.G. Shevchenko Kiev National University, Dnipropetrovsk National University, I.I. Mechnikov Odessa National University, Fedkovich Uzhgorod National University, Lugansk National Agrarian University, Institute of Plant Physiology and Genetics of NAS of Ukraine, N.G. Kholodniy Institute of Botany of NAS of Ukraine, V.Ya. Yuriev Plant Production Institute of UAAS, Institute of Selection and Genetics of UAAS, National Centre of Plant Genetic Resources of Ukraine, Institute of Cryobiology and Cryomedicine of NAS of Ukraine, Institute of Forestry and Agromelioration of UAAS, V.V. Dokuchaev Kharkov National Agrarian University.



Head of the department

Vasyl Vasylyevich

Zmurko

Our papers



A laboratory
«Plant Growth
and Development»



A biotechnological
laboratory



An experimental
field plot



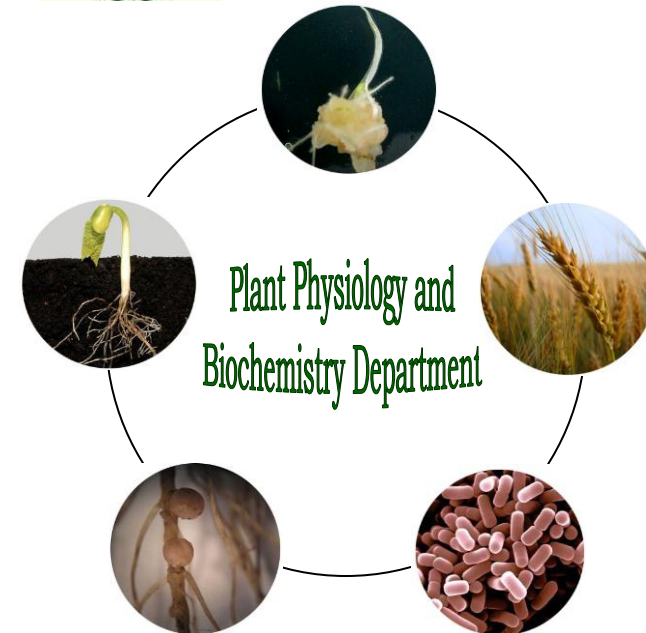
Our graduates



**V.N. Karazin
Kharkov National
University**



**The School of
Biology**



V.N. Karazin Kharkov National University,
Plant Physiology and Biochemistry
Department
4 Svobody sq., Kharkov, 61077, Ukraine

Head of the Department
Vasyl V. Zmurko, Doctor of Sciences
(Biology), Full Professor
E-mail: Zmurko@univer.kharkov.ua
Phone: 707-52-32