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Dear Colleagues,

The 4th International Symposium on EuroAsian Biodiversity (SEAB2018) which held July since 3 till 6, 2018 organized by the Institute of Cell Biology and Genetic Engineering (NASU) and Taras Shevchenko National University of Kyiv, UKRAINE.

The program of SEAB2018 included all aspects of basic and applied biodiversity researches.

This Symposium provided us not only with the opportunity to learn about the newest biodiversity research developments, but also to strengthen professional and personal contacts with colleagues throughout the world.

With kind regards,

Dr. Namik Rashydov

Co-Chair of SEAB2018

Editors: Olena Nesterenko, Andrii Potrohov, Lidiya Khudolieieva, Nataliia Kutsokon

A Part of the Territory of the Vast Forest Slopes of the Lesser Caucasus Mountains

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The aim of the work: Here forests in the form of separate arrays of main foothills of the northern, north-eastern and eastern slopes covered. Lesser Caucasus in the north eastern region, coniferous forests mainly Garmagvari Goygol, around the villages of Tovuz region of pine trees and forests are found in the Winter. The region's forests are mostly deciduous broadleaf types.

Lesser Caucasus in the north-east slopes of the mountainous areas in order to prevent the collapse of lands from erosion and degradation processes, corrupt forest restoration and planting new forests urgent problems of the time. The time taken to curb the growth of forests, erosion, severe ecological disasters, erosion processes, expansion, growth of gray areas, mountainous areas, floods and landslides, avalanches, there will be the danger of drying up of springs and rivers. In these areas, particularly in low-lying areas of the few non-wooded forests and protective forests and forest several times the amount of restoration and large-scale studies are being carried out in order to rekanstruksiya. That should be considered to be increasingly limited areas of forests and large-scale logging operations in these areas because of decreasing erosion threatens the forest. Deforestation, erosion and collapse of slopes, unsystematic cattle grazing, drought, the cultivation of agricultural crops and natural vegetation areas. antropodinamik factors resulted sukssesiyalarla. The above-mentioned factors dramatically affect the vegetation of the area.

Materials and methods: In order to prevent water erosion in mountainous areas, protective forests, as well as a large set of measures for the rehabilitation of rivers basins (reforestation, aqromeliorativ and hidromeliorativ) should be led.

Forest fund is the precious treasure of the people. At the moment, the most important problem of forestry is focused and efficient use of the forest fund. In Azerbaijan, this problem is very actual, so here the forest areas are so few, the reserve of the soil areas that will be given to the forest production is limited. In our forests, 150 species of feral fruit plants of 1536 species are available. There are thousand tons (walnut, apple, pear, dogwood, hawthorn, medlar, hazelnut, pistachios, dates, hawthorn, blackberry, etc.) of feral fruit products in these plants. 30 percent of these fruits are significance of consumption products.

Results: Forest Protection and Restoration Department of Tovuz region has an area of 100 hectares seeding. Each year more than one million seedlings of various species in these areas are grown. Tinglərdən species of deciduous and coniferous forests in Tovuz grown in areas facing severe ecological disasters, steppe areas, to prevent the growth and expansion of erosion processes are used in greening mesəbərpası and road edges. Since the road had a positive impact on the ecology of trees and shrubs.

Keywords: Lesser Caucasus in the north-eastern part of the forest, erosion

Age-Related Pyruvate Kinase Activity in Brain Structures of the Rats Subjected to Hypoxia in Prenatal and Postnatal Ontogenesis

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Aim of the study: The studies of the time-related changes in pyruvate kinase activity(PK; EC 2.7.1.40) under stressful factors raised big interest in researchers. The aim of this study was a comparative analysis of the changes in PK activity, one of the key enzymes of energy metabolism in the brain, in relation to the age of the animals, brain structures and period of hypoxia.The experiments were conducted in accordance with bioethical principles and guidelines documents, recommended by European scientific fund and Helsinki declaration.

Material and Methods: In the 1stseries of the experiments 20 albino female rats were exposed to hypoxia in special gas mixture (5% of oxygen, 95% of nitrogen) in the stage of organogenesis of prenatal development during 5 days, daily for 20 min in a special hyperbaric chamber. The progeny was divided into 3 groups and were bred until they achieved 17-day, one-month (these aged groups of rats are considered to be critical ones in postnatal development) and three-month ages. The 2ndseries of the experiments were carried out on the albino male rats of 3 age groups: 3-month-old (mass 90-110 g), 6-month-old (mass 130-150 g), 12-month-old (mass 190-220 g). After each series of experiments the animals were sacrificed and the whole brain was carefully dissected on ice and orbital, sensorimotor, limbic cortices, hypothalamus and cerebellum were identified. In order to eliminate the effect of handling stress the appropriate control group of animals of the same age were placed into the same chamber under normal oxygen content. PK- activity was determined by the method of H.U.Bergmeyer.

Results: Energy metabolism in the brain differs from other tissues by its high reactivity and plays an important role in adaptation of the functional state of a whole organism to stressful factors.

The dynamics of changes in PK-activity in brain structures of rats exposed to hypoxia on E13-E17 days of intensive organogenesis, did not show restoration of PK activity up to the control indexes on P17, P30 and P90 days ($p<0.01$; <0.001).The results show, that hypoxia, given to fetus during organogenesis leads to changes in glycolysis process in the brain structures that bears irreversible character.

The results of postnatal exposure to hypoxia on P90, P180 and P360 days showed that with increasing age, animals get more resistant to the effects of exogenous stress factors, indicating to switching on more mature adaptive-compensatory mechanisms in these age groups ($p<0.01$).The highest resistance was observed in cortical structures. These data are considered as an evidence of realization of biological effects of hypoxia through oxidative mechanism.

The study of the age-related changes in the PK-activity in the brain structures in response to hypoxia will allow understanding the mechanisms of redox–shifts in the brain, subjected to hypoxia in prenatal and postnatal periods of ontogenesis.

Key words: rats, brain structures, hypoxia, pyruvate kinase, ontogenesis,age-related changes.

Agroflora of the Watered Areas in the Lesser Caucases

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Based on the analysis of biological and morphogenetic features of the natural conditions and lands of the north-western slope of the Lesser Caucasus the modern ecological situation in the territories have been learned. As the result of studies, changes in the speed of the soil of the antropogen and natural causes in North-western slope of the Lesser Caucasus,erosia and salinization processes and these negative consequences have been fixed in the administrative regions , soil composition, structure, agricultural areas have been analyzed. According to the study, 11 families , 77 genera and 221 species have been identified on the plant cover of the hay field. 51.58% legumes ,42,53%grains and 5.88% various grasses are organise in the area.

Material and Methods: In the practice, mowing was conducted with grass mowing aggregate,it has been sown and dried in the area and dry weight determined. Agro-technical measures which accepted for the district were taken in the practise area. For the learning agro-chemical characterics of the experience field lands, before putting experience 0-30 from 5 konvert form; 30-60; 60-100 cm layers of soil samples have been taken and analysed. After the first and last mowing, mixed soil samples were taken from 0-30 and 30-60 cm layers phenological observations and biometric measurements taken every cutting out. Results of the experience were confirmed with mathematical calculations. The economic efficiency of fertilizers calculated with the method N.N.Baranov for the additional product costs.

Rainfall is important for the take higher yields of agricultural crops and feed plants in the irrigated regions of the Lesser Caucasus. Provision of poor water irrigation of the region and forage crops dont allow substantial expansion of arable lands.

Results: Studies show that, there are humus 2.1%, nitrogen 0.18%, 0.16% phosphorus, 2.58% potassium in 0-20% layer of irrigated chestnut soils. Amount of flexible food items were organised of easy hydrolysis of the 108.2 nitrogen,flexible phosphorus 18.6 , exchanging potassium 241.0 mg / kg, in the accordance layer. 80-100 cm layer significantly decreased the amount of nutrients. During the summer months little rainfall and mountain water scarcity prevents cultivation of fodder crops. It becomes clear of perennial informations ,rainfall is much important for cultivation forage crops. According to information,much more precipitation rainfall in Aprel, May and June months. Amount of rainfall sharply decreases over the years.Precipitation sharply decreases in July and August months, lack of irrigation water.

As a result, the size of the launch and development become weakening of agricultural crops. In Showing months,spoil the rainfall at all,lack of irrigation water does not allow plants moisture to ensure the normal manner in the region. The relative humidity is of great importance to cultivate plants in rural agricultural. During the summer months little rainfall and mountain water scarcity prevents cultivation of fodder crops. It becomes clear of perennial informations ,rainfall is much important for cultivation forage crops. According to information,much more precipitation rainfall in Aprel, May and June months. Amount of rainfall sharply decreases over the years.Precipitation sharply decreases in July and August months,lack of irrigation water.

These plants play an important role in the formation of temporary seasonal vegetation. The main senoz forming of grass cover organise long-term permanent natured perennial grass, bushes, shrubs and kolca pictures are made up of species. According to the study, 11 families, 77 genera and 221 species have been identified on the plant cover of the hay field. 51.58% legumes, 42,53% grains and 5.88% various grasses are organise in the area.

Keywords: mowing, forage crops, senoz, species

Analysis of Morphological Polymorphism of Seeds of Some Oak Species Found in the Research Base of the Dendrology Institute

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Aim of the study: The genus *Quercus* L., popularly known as oaks show highest morphological variations among species and populations. The major reason for the phenotypic diversification of oaks is the high frequency of hybridization among species.
Morphological signs of acorns in different oak species are different. Can morphology of acorns be distinctive for at least some groups of Quercus? To answer that, this study has aimed to evaluate the morphological variations among acorns of different groups of Quercus species as well as acorns of closely related species. By this way it would be possible to show whether they are morphologically different.

Materials and methods: In Azerbaijan flora encountered 6 species of oak genus, 3 kinds of species are introductive species. There are 5 spices of oak genus (*Q.castaneifolia C.A.Mey., Q.araxina (Trautv) A.Grossh., Q.pedunculiflora C.Koch., Q.ilex L., Q.suber L.*) in the research base of the Institute of Dendrology, ANAS. The first 3 spices spread in natural conditions in the Azerbaijan flora, the 2 spices have been introduced bringing from the Mediterranean coast. In Absheron condition Quercus suber L. does not produce seeds. The article analyzes the variability of the morphological parameters of the seeds of the other four species. Acorns were picked up directly from trees. Acorn samples were chosen randomly among the mature and normal shaped ones during sampling process. Morphological polymorphism of acorn among and within the groups of *Quercus* species were studied. A total
of 100 acorns belonging to 4 species of *Quercus* L. (Fagaceae) in Dendrological park were examined in this study. Measurements of 3 characters: length, diameters and mass were taken from of each acorns. Variation order was drawn up and performed mathematical analysis.

Results: Morphological variations of acorn among and within the groups of *Quercus* species were studied. Defined that, distribution for length of acorns are average (V=11-25%) in all investigation species, distribution for diametr of acorns are normal (V=26,84%) in *Q.castaneifolia C.A.Mey,* in Q*uercus pedunculiflora C. Koch* and *Quercus araxina (Trautv) A.Grossh are* average, in Q.ilex L. is asymmetric (V=51,16%). İn *Q.ilex L.* distribution for mass of acorns are asymmetric too, so that V=66.34%, in other three species distribution are symmetric. This study has proved the taxonomic utility of fruit characters in Fagaceae and also states that relationships among the characters can be explained by the use of morphometric methods.
The fluctuation of reaction rate is great importance for adapting organisms to the natural environment, so it ensure the keeping and increase of species.

Key words: Quercus L., acorns, variation row, modification variability

Antimicrobial Properties of Widespread in Azerbaijan Flora *Rosa nizami* Species

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Aim of the study: Three types of substances (extract, juice, essential oil) obtained from Rosa nizami (genus Rosaceae) in thelaboratoryof Ethnobotany in the Institute of Botany of Azerbaijan National Academy of sciences (ANAS)were delivered to the department of microbiology and immunology of Azerbaijan Medical University. Antibacterial and antifungal properties of substances were investigated.

Material and methods: Essential oil and extract produced from flowers and juice obtained from fruits of endemic plant of Azerbaijan Rosa nizami were the objects of investigation. Disk diffusion method was used to investigate antibacterial and antifungal characteristics of substances. Staphylococcus aureus (Gram-positive), Escherichia coli, Pseudomonas aeruginosa (Gram-negative), Candida (yeast) were used as test cultures during research. Suspensions were prepared according to MacFarland standards (1 billion microbial cells in 1 ml of suspension). Then, suspensions were inoculated onto Sabouraud dextrose and Muller Hinton media and kept for 10 minutes at 37 ˚C. Sterile discs dipped into substances for 3-5 minutes were applicated into media with microorganisms. Petri dishes with MH were incubated at 37 ˚C, with SDA – at 28 ˚C for 24-48 hours.

Results: Rosa nizami is endemic and rare plant of Azerbaijan. Commonly grows in North-East of Small Caucasus and Nakhchivan Autonomic Republic. Soluble extract and essential oils of plant were prepared from flowers gathered in Jule. Juces were produced in October – after fruit ripening. Results if investigations were obtained using controls. Substance 1 had the highest antimicrobial activity. 3% and 10 % solutions of substance 1 were tested for antimicrobial activity using disc diffusion method. Obtained results are given in tables below.

Table 1. Results of antimicrobial activity of substances against different microorganisms.

Test-culture	Substance			Control-alcohol		
	1	2	3	1	2	3
Staphylococcus aureus	12 mm	11 mm	-	8 mm	7 mm	3 mm
Escherichia coli	7 mm	10 mm	-	8 mm	7 mm	11 mm
Pseudomonas aeruginosa	7 mm	8 mm	-	-	-	-
Candida albicans	10 mm	6 mm	-	-		-

Table 2. Antimicrobial effects of different %-solutions of substance 1.

Test-culture	In 3% alcohol	Control-alcohol	In 10% alcohol	Control-alcohol
Staphylococcus aureus	11 mm	8 mm	5 mm	5 mm
Escherichia coli	13 mm	8 mm	10 mm	5 mm
Pseudomonas aeruginosa	12 mm	5 mm	6 mm	5 mm
Candida albicans	12 mm	7 mm	7 mm	6mm

Acknowledgements. Investigation was conducted on basis of cooperation agreement between the department of Microbiology and immunology of AMU and laboratoryof Etnobotany of ANAS.

Key words: Essential oil, extract, *Rosa nizami,* antimicrobial

Anti-tumor, Radioprotective and Immunomodulatory Activity of Water Soluble Extracts of Basidiomycetes

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Aim of the study: the aim of our study was to assess the influence of water soluble extracts of Basidiomycetes on the development of tumor process in *A/f* mice, possibilities of increasing the effectiveness of the cytostatic drugs therapy, outcome of radiation sickness and activation of alveolar macrophages.

Material and Methods: the water soluble extracts of *Flammulina velutipes (Curt.:Fr.)Sing (strain 229), Auricularia auricular-judae (Bull.) J. Schröt*, (Forest Institute of NAS of Belarus) and *Phallus impudicus L.: Pers* (the bodies were collected in the woods near Gomel) were tested.

Experiments are performed on *A/f* mice (2-3 months of age, body weight of 19-22 g). Animals were in laboratory vivarium at 22.0ºC. Antitumor activity of extracts of mushrooms has researched in the test definition out of spontaneous and chemical induced (mutagen-urethane) lung adenomas. The impact of *Ph. impudicus* extract on the growth of tumors and the efficacy of cytostatic therapy (cyclophosphan) for mice with Ehrlich carcinoma were study. The speed of tumors growth was estimated to alter its volumes. Evaluation of radio protective efficacy extract of *Ph. impudicus* was investigated by survival rate of mice after irradiation (7.0 Gr), as well as on its impact on bone marrow cells after exposure dose 5.5 Gr (Cs^{137}). Determination of endogenously formed colonies in spleen conducted in 9 days of exposure. The total cell count of bronchoalveolar lavage, percentage of alveolar macrophages, lymphocytes and granulocytes, phagocytic activity of alveolar macrophages with latex beads was study.

Results: the prophylactic receipt of *Aur. auricularia* extract before urethane injection reduced the quantity of lung adenomas more than 3 times. The quantity of lung adenomas/mouse was reduced after used within 14 days of extract of *Fl. velutipes*. Frequency of tumorigenic process also was reduced compared to control. The prophylactic reception within 14 days of extract of *Fl. velutipes* lead to decreased by 10% quantity mice with adenomas after introduction urethane.

Water soluble extract of *Ph. impudicus per os* reduces expressiveness of symptoms of radiation sickness after a single external irradiation of mice in a dose 7.0 Gr.

Survival rate of mice that took water extract of mushroom a week before exposure was of 3.95 times greater than the exposed mice that took tap water.Water extract of *Ph. impudicus* increased the number of endogenously colonies in spleens of mice after an irradiation (5.5 Gr).

The extract of *Ph. impudicus* leads to reducethe the tumor volumes in an experiment on mice with Ehrlich carcinoma. Extract of *Ph. impudicus* was shown increase of cyclophosphan cytostatic therapy efficacy for mice with Ehrlich carcinoma: the inhibition of tumor growth was by 64.5% higher compared with mice without cytostatic treatment, and by 15.6% compared with the animals treated of cyclophosphan.

Keywords: Flammulina velutipes, Auricularia auricular-judae, Phallus impudicus, adenomas, Ehrlich carcinoma, macrophages.

Aquatic Plants and Animals Within The Chernobyl Exclusion Zone: the Effects of Long-Term Radiation Exposure on Different Levels of Biological Organisation

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Aim of the study: Evaluation of dose-dependent cytogenetic, hematologic, histologic, morphometric, production, parasitological and population effects on aquatic species of different taxonomy due to long-term radiation impact.

Material and Methods: The researches were carried out during 1998-2017 within the Chernobyl exclusion zone (CEZ). The water objects were the flood plain water bodies of the Pripyat River within 10-km area around the destroyed unit of the CNPP - Azbuchin Lake, Yanovsky Backwater, Dalyokoye Lake, Glubokoye Lake as well as different parts of the CNPP cooling pond and rivers Uzh and Pripyat. The result of analyses was compared to the data received for hydrobionts from water bodies with background levels of radioactive contamination.

Results: The absorbed dose rate for biota of the researched water bodies was registered in range 1.3 mGy $year^{-1}$ - 3.4 Gy $year^{-1}$. It is determined that the rate of chromosomal aberrations in the roots of the helophyte plants of the most contaminated lakes on average in 2-3 times and in cells of the pond snail embryos in 4-6 times exceeding the spontaneous mutagenesis level, inherent to aquatic organisms. Leukogram analysis of peripheral blood of fish showed the decrease of part of lymphocytes, responsible for the implementation of immunological reactions. At that it is registered increase in the number of granulocytic elements (neutrophils and pseudoeosinophils), responsible for phagocytic function and involved in allergic and autoimmune reactions. Along with changes in leukograms an increased level of morphological damages of erythrocytes (deformation of nucleus and cell membrane, nucleus and cytoplasm vacuolization, pyknosis and lysis of cells, forming of microcytes, schistocytes, double nucleus cells and micronuclei) was determined, which is generally for pray fish in 4-12 times and for predatory fish in 7-15 times higher than in fish from reservoirs with background levels of radioactive contamination. Analysis of the viability of the seed progeny of the common reed at germination in the laboratory showed that in gradient of absorbed dose rate from 0.03 to 11.95 cGy $year^{1}$ for parental plants in lakes, there is a reduction in technical germination (from 93 to 60%), germination energy (from 91 to 30%) and seed viability (from 54 to 38%). At the same time significantly increased the number of abnormalities of seed seedlings: necrosis of roots (from 1.3 to 14.7%); disturbance of gravitropism (from 2.6 to 17.0%); damages of organogenesis (from 4 to 24%) and disturbance of chlorophyll synthesis (from 0 to 2%).

Acknowledgements: This study was supported by the NAS of Ukraine, the State Agency of Ukraine on the Exclusion Zone Management and partly – by the TREE (Transfer-Exposure-Effects) consortium, funded by the Environment Agency and Radioactive Waste Management Ltd. (UK). The authors wish to thank the personnel of the State Specialized Enterprises "Ecocentre" and "Chernobyl NPP" for promoting research within the CEZ.

Keywords: Chernobyl exclusion zone, radioactive contamination, aquatic biota, dose rates, effects.

Associated Evaluation of Rare Species of Plants of the Shatsk National Natural Park

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Aim of the study: In the flora of the Shatsk NPP, the status of the "Red Data Book" at different times was of different kinds, since their rarity was determined depending on the approach to assessing the occurrence of the species and the threat of its disappearance from a certain territory, however, this provision needs to be clarified.

Material and methods: An important aspect of the analysis of the flora of any nature conservation object is the allocation of its rare component, the clarification of the sozological structure and representation in the Red Books. According to the latest edition of the Red Data Book of Ukraine (2009), at the Shatsk NPP, there are already 47 species of plants that are protected, which states that the species is "protected in Shatsk NPP". Since the analysis of the list and the motives of the protection showed that the last five species of plants listed in the list, including the lavender larvae, the marsh marsh field, the crawfish gudarya, the blueberries and the walnut flying willow are, however, indicated for Flora of Shatsk NPP in literary sources, but the herbarium collection of these species from the territory and reservoirs of the park is still absent. But in the Red Data Book of Ukraine (2009) for these species it is indicated - "they are protected in Shatsk NPP", therefore they are conditionally included in the list of protected persons. We carried out a morphological analysis of rare species of vascular plants that grow on the territory of the Shatsk National Nature Park. The morphological descriptions of 44 examined plants and their location on the territory of SSTP are made. An absolute majority of rare species is represented by angiosperms, the proportion of which is 90.7%. They belong to 2 classes of Liliopsida and Magnoliopsida, which respectively have 14 and 25 species. Planuoscopic (Lycopodiophyta) are represented by 3 species, which make up 6.8%, to the genital organs (Polypodiophyta) belongs to 1 species (2.2%). The analysis of the quantitative ratio of species showed that among the rare species of vascular plants that grow on the territory of the studied area, the largest number of representatives of the Orchidaceae family, which is comprised of 14 species, is 33% of the total number of all species; The family Cyperaceae has 6 species (14.3% of the total), the family Droseraceae, Lycopodyaceae, Lentibulariaceae has 3 species (which is 7%). Families of Caryophyllaceae, Iridaceae, Ophioglossaceae have 2 species (3.2% of the total). The least numerous are 9 families: Vacciniaceae, Crasulaceae, Liliaceae, Betulaceae, Salicaceae, Fabaceae, Juncaceae, Ophioglossaceae, Ranunculales, Sheuchzeriaceae, having a single representative of a total of 2.3% Most of the plants grow on the territory of Melnikovsky forestry. There are 30 species registered in the area. Within the limits of Svitiag forestry, 11 species were found. The phytocoenoses of the Rostan and Pulim forestry have 5 rare species of plants.

Results: According to the results of the sozological analysis of the studied vascular plants, it has been established that rare species of the Shatsk National Nature Park are classified as rare - 5, species are vulnerable - 29 species, inestimable - 9 species.

Kaywords: Shatsk national natural park, rare species of plants, systematic analysis.

Biodiversity Aspect Expression of Key Flowering Genes in *Arabidopsis Thaliana* under Different Mode Ionizing Radiation

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Aim of the study: The study aim is investigate how blooming process of plant depends on a mode of ionising radiation. Our results have shown that chronic radiation on hundred fold of dose (17 cGy) less than acute exposure (15 Gy) have caused to delay blooming. But small chronic dose (3 cCy) have caused opposite effect. We notice that changes in level of expression of key flowering and reparations genes are not related. Presumably, it's related with activation of DNA reparation processes in 3 cGy chronic exposure and 15 Gy acute exposure.

Material and Methods: For our study we used *Arabidopsis thaliana* Columbia ecotype, wild-type. The plants were cultivated in soil, under 18/6 light/dark light illumination at room temperature. 25 experimental plants and the same quantity to control group were taken into the study. Chronic radiation acting on plants was performed with ^{137}Cesium chloride in total dose 3 cGy and 17 cGy, dose rate 10^{-7} cGy/sec and $6{,}8*10^{-6}$ cGy/sec. In acute exposure, plants were irradiated by X-rays in total dose 15 Gy, dose rate 89 cGy/sec. Plants was irradiated at 5 week age in shoot growth stage.

To determine the activity of studied genes were used quantitative PCR method. To perform real time PCR analyses, we designed specific primers for flowering genes and sensitive to radiation acting genes with NCBI BLAST and literature data. To referents gene we used *UBQ10*. The PCR real time data were analysed with REST 2009 software.

Results: Analysis of genes activity showed that 3 cGy chronic radiation increases expression of *Co* (1.15), *Gi* (1.054), *Ap1* (2.708) and *Rad 51* (1.059) genes activity and decreases expression of gene *PCNA2* (0.874) in comparison of control group (Ref. *Ubq10*) at 95% C.I. At 17 cGy chronic exposure decreases expression of genes *Ap1* (0.349), *FLC* (0.268), *Rad 51* (0.83) *PCNA2* (0.838) at 95% C.I. But at 15 Gy acute exposure increases expression of genes *FT* (4.558) and *PCNA2* (1.289) and decreases expression of *Co* (0.986), *Ap1* (0.189) at 95% C.I.

Increase of *Co, Ap1* and *Gi* expression can stimulate earlier flowering and decreasing of Ap1 and *Co* cause delay blooming. Acute exposure cause increasing of *Rad51* and *PCNA2* genes and decreasing of flowering genes except *FT*. In this case, flowering delayed least than 17 cGy. Obtained data reveals that chronic ionising radiation carry out more strong biodiversity changes than actual radiation.

Acknowledgements: Our study supported by IRSES GA-2013-612587 «Plant DNA tolerance»

Keywords: *Arabidopsis*, chronic radiation, acute radiation, flowering, gene's expression

Biodiversity of Decorative Plants in Conditions of Absheron

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Aim of the study: Institute of Dendrology territory is consisted of 12 hectares; it has a beautiful example in Absheron landscape architecture. During the scientific work carried out in Institute Dendrology of NAS Azerbaijan in laboratory "Landscape architecture", biological and ecological features of decorative trees, shrubs and grass plants which introduced from local and foreign flora were studied in the area of Arboretum within the condition of Absheron and in Baku were developed by using these plants the decorative compositions with different forms. There has been arisen an urgent need for reconstruction and renovation of park and gardens landscape compositions, the creation of new compositions in flower and ornamental plants landscape architecture.

Materials and methods: The research objects are different species and genus of ornamental trees, shrubs and herbaceous plants. We have used 2 styles of composition structures: regular in form of geometric shapes or landscape. Each year in the compositions are changed annual plants with another annual plants, but perennial plants are stayed fast. In centre of compositions has been planted taller, mostly evergreen shrubs and trees, and at the edge are planted lower, perennial plants and annual herbaceous plants. We have aim to have plants in well grown in plants composition and evolved; we have picking them with the request of soil, light, heat and moisture. There are chosen plants in compositions by the way that their blooms are changed at the same time from fade plants changing to other flowered plants, thus is ensuring the continuity of flowering. Nowadays by creating flower compositions has paid much attention to bulbous and tuberous plants. These plants are hyacinth, tulip, narcissus, gladiolus, crocus, lily and etc. Bulbous and tuberous plants are differed of high decorative quality, beautiful, fast flowering and are used in design of flower-gardens. In the research work has studied biological and ecological features of bulbous and tuberous plants and there has used in the creation of compositions.

Results: There are collected many plants in Institute of Dendrology from around the world. There are described results of scientific research works on determining works of most introduced, perspective, trees, shrubs and herbaceous plants from local flora and plants from foreign countries in using of creating different compositions in Absheron. Also there are studied their biological and ecological features. It was established that the introduced plants from different countries and ornamental plants from the local flora were well adapted under the Absheron climatic conditions and they were recommended for the creation of various compositions in parks, squares. Use of trees, shrubs and herbaceous plants is profitable giving them the superiority in the creation of original forms of compositions.

Keywords: biodiversity, composition, plant, landscape, park

Biodiversity of Genus *Pyrus* L. (Rosaceae Juss.) in Flora of Azerbaijan Republic

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Aim of the study: There are more than 150 species wild fruits and berries belonging to the 15 families and 36 generas in the forests of Azerbaijan. Their composition is rich in various vitamins, microelements, proteins, fats, sugars, acids, in a word, with many essential elements useful for human organisms. From this point of view, wild fruits do not fall behind cultivated fruit types and sometimes they are superior from them. One of the wild fruits is the species pear belonging to the genus *Pyrus* L. grown in our forests. 27 species from them are grown in the Caucasus. As a result of researches conducted by T.H. Talibov and A.M. Ibragimov there have been identified 17 species and 3 variations of wild pear have spread in the territory of Nakhchivan Autonomous Republic.

Material and methods: Floristic studies were conducted in the Nakhchivan Autonomous Republic in the years 2004 -2017. The list of species is based on the observations made by the author, relevant data from publications, and the herbarium of the Institute of Botany of Azerbaijan National Academy of Sciences and Institute Bioresources of Nakhchivan Section of Azerbaijan National Academy of Sciences and Nakhchivan State University. The documentary evidence of containing herbarium materials are found in the Herbarium of the Institute Bioresource of Nakhchivan Section of Azerbaijan National Academy of Sciences. The study determined the localities with great diversity due to their richness in species, hybrids, ecotypes and forms. For each locality the coordinates and the altitudes were determined by using GPS.).

Results: It has been revealed that currently 21 species of wild pears belonging to the Pyrus L. genus are known in the flora of Azerbaijan. 17 species of them have been spread in the area of Nakhchivan Autonomous Republic.

Pyrus zangezura Maleev., *P. voronovii* Rubtz., *P. georgica* Kuth., *P. demetrii* Kuth., *P. fedorovii* Kuth., *P. psuedosyriaca* Gladkova., *P. chosrovica* Gladkova., *P. megrica* Gladkova, P. caucasica var. *schuntukensis* Tuz., *P. salicifolia* var. *angustifolia* Kuth., *P. salicifolia* var. *latifolia* Alexenko species have been given firstly for the flora of Azerbaijan and Nakhchivan Autonomous Republic.

As a result of climate change and anthropogenic factors in recent years in the Autonomous Republic considering the wild pears of *Pyrus boissieriana* Buhse (CR A2 abc; C1), *P. eldarica* Grossh. (CR A2 abc; C1), *P. grossheimii* Fed. (CR A4 cd; C1), *P. hyrcana* Fed. (CR A2 abc; C1), *P. salicifolia* Pall. (NT), *P.vsevolodii* Heidemann (NT) species rareness and endangering they have been included the Red Book of Azerbaijan Republic, *P. medvedevii* Rubtz. (NT), *P. syriaca* Boiss. (NT), *P. zangezura* Maleev. (VU B1a(i)c(ii); C2a(i)), *P. raddeana* Woronow (VU B1a(i)c(ii); C2a(i)), *P. voronovii* Rubtz. (VU B1a(i)c(ii); C2a(i)), *P. megrica* Gladkova (VU B1a(i)c(ii); C2a(i)) species have also been included the Red Book of Nakhchivan Autonomous Republic.

Keywords: Azerbaijan Republic, wild pear, *Pyrus* L., flora, rare species, distribution areas, Red Book of Azerbaijan Republic and Nakhchivan Autonomous Republic.

Biodiversity of Plant Viruses Affecting Ornamental Plants in Ukraine

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Aim of the study: The susceptibility of ornamental plants sensitivity to infectious diseases limits their popularity. Virus diseases are of great economic importance in ornamentals because most of them are propagated vegetatively. This kind of plant propagation, either by tissue culture or by scions, bulbs, rhizomes, or other tissues, is the most economic method to propagate plants maintaining their uniformity. Virus diseases are of great significance because even when present in the latent state, the viruses could be transmitted to healthy plants and cause commercial losses. Our work was focused on analysing the diversity and spread of virus diseases of ornamental plants in Ukraine.

Material and methods: Plant samples of ornamentals (orchid, cactus, gladiolus, lily, gerbera, iris, hosta etc.) with visual virus-like symptoms were collected from Botanical gardens and private collections in different parts of Ukraine over the last 20 years. Collected samples were examined for about 15 plant viruses endangering ornamental plants in Europe and Asia using double antibody enzyme-linked immunosorbent assay (DAS-ELISA) and indirect ELISA with commercial antiserums (Loewe (Germany), Prime diagnostics (Netherlands)). The RT-PCR was accomplished using specific primers complementary to various parts of viruses' genomes. For sequencing of virus genes, we used Applied Biosystems 3730x1 DNA Analyzer with Big Dye terminators, version 3.1 (Applied Biosystems, USA). Recombinants were identified using RDP4 package, phylogenetic analysis was conducted using Neighbor-Joining and/or Maximum Likelihood method(s) in MEGA 6.

Results: The obtained results indicate the abundance of viruses affecting decorative plants in Ukraine. For orchid cultivated in Botanical gardens, *Cymbidium Mosaic Virus* (*CymMV*) and *Odontoglossum ringspot virus* (*ORSV*) were detected in greenhouses only. In orchids mixed infections were typically represented by a couple of these viruses (*CymMV* and *ORSV).* Besides, in orchid collection of Ukrainian Botanical gardens the presence of mixed infections caused by viral and bacterial agents are defined. For *Lilium* plants *Lily symptomless virus* (*LSV*) were prevailed. *Gladiolus* plants were infected with *Cucumber Mosaic Virus* (*CMV*), *Tomato mosaic virus* (*ToMV*) and *Tomato aspermy virus* (*TAV*). *Cactus virus 2* (CV2) were identified in *Cactaceae* plants from Ukrainian Botanical gardens. Detection of *Hosta virus X (HVX)* in collections of *Hosta* plants in 2012 was the first evidence of *HVX* occurrence in Ukraine.

According to obtained outcomes, *ORSV* and *CymMV* are the most widespread viruses infecting orchids in greenhouses. Phylogenetic analysis showed that Ukrainian isolates of theses viruses share high level of similarity with Korean isolates. In phylogenetic studies it was showed that the *CMV* isolated from the gladiolus is represented in the first subgroup of group A and is related to the *CMV* isolates from European vegetable crops.

Acknowledgements: The authors are thankful to Dr. Ivan Boubriak and Dr. Meletele Navalinskiene for their help.

Keywords: ornamental plants**,** plant virus, diversity, Ukraine

Biodiversity of Plant Viruses Endangering Vegetable Crops in Ukraine

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Aim of the study: There is a vast number of taxonomically different viruses inducing great yield losses of vegetable crops in the world. Thanks to the rapid development of greenhouses and seed trade in the recent years, vegetables became especially important crops in Ukraine. The problem of viruses endangering production of vegetables remains understudied as many pathogens are not described or detected at all. This work was focused on analysing the diversity and spread of virus diseases of vegetable crops in Ukraine and revealing tentative novel pathogens of virus nature.

Material and methods: Plant samples of vegetables (tomato, cucumber, sweet pepper, cabbage, radish, squash, pumpkin, melon, etc.) with visual virus-like symptoms were collected from the fields and/or greenhouses in different parts of Ukraine over the last 20 years. Collected samples were examined for about 15 plant viruses endangering vegetable production in Europe using double antibody enzyme-linked immunosorbent assay (DAS-ELISA) with commercial test systems (Loewe and DSMZ (Germany), Agdia (USA)). The RT-PCR was accomplished using specific primers complementary to various parts of viruses' genomes. For sequencing of virus genes, we used Applied Biosystems 3730x1 DNA Analyzer with Big Dye terminators, version 3.1 (Applied Biosystems, USA). Recombinants were identified using RDP4 package, phylogenetic analysis was conducted using Neighbor-Joining and/or Maximum Likelihood method(s) in MEGA 6.

Results: Our results confirm the increased number of viruses infecting vegetables in Ukraine. For cucurbits cultivated in the open field, *Zucchini Yellow Mosaic Virus* (ZYMV), *Cucumber Mosaic Virus* (CMV), *Watermelon Mosaic Virus* 2 (WMV-2), and *Cucurbit Aphid-borne Yellows Virus* (CABYV) were detected. In comparison, *Cucumber Green Mottle Mosaic Virus* (CGMMV) and *Impatiens Necrotic Spot Virus* (INSV) were found in the greenhouses only. For plants of *Solanaceae* family, *Potato virus Y* (PVY), *Pepper Mild Mottle Virus* (PMMV), *Tomato mosaic virus* (ToMV), and *Turnip Mosaic Virus* (TuMV) prevailed. Brassicas were infected with TuMV and CMV.

Both mono- and in mixed infections were found. In cucurbits, mixed infections were typically represented by a couple of viruses, i.e. WMV 2/CABYV, WMV 2/CMV, CMV/CABYV, ZYMV/CABYV and WMV 2/ZYMV. For plants of *Solanaceae* family, PVY/ToMV and PVY/ToMV/CMV infections were recorded. According to obtained outcomes, WMV 2, CMV, ToMV, PVY, TuMV (and CGMMV in the greenhouses) are the most widespread viruses infecting vegetables in explored parts of Ukraine.

Several new for Ukraine viruses have been described including PMMV and TuMV. Phylogenetic analysis showed that Ukrainian isolates of viruses infecting vegetable crops share high level of identity and typically belong to the most frequent phylogenetic groups.

Acknowledgements: The authors acknowledge partial support from the Ministry of Education and Science of Ukraine, and are thankful to Dr. Ivan Boubriak for his help.

Keywords: plant virus, diversity, vegetable crop, phylogenetic analysis, Ukraine

Bioecological features of carnation species (*Dianthus* L.*)* spread in the rocks and debrises of the north-eastern parts of the Lesser Caucasus

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Aim of the work: The article deals with the species composition, spreading features and bioecological characteristics of *Dianthus* L. species spread in the cliffs and debrises of the north-eastern parts of Little Caucasus. *Dianthus* L. species plays special role in the rock and debris planting. The great majority of the species adapted to drought conditions.

The species includes edible plants such as buckwheat, rhubarb, beet, spinach and sorrel. The various types of amaranth, decorative garden plants as well as carnation and cactus plants, such as astrophytes, hymnocalcium, mammilia. It includes also weeds belonging to carnation species.

The aim is to identify the species of *Dianthus* L. spread on the north-eastern part of the Lesser Caucasus. Many petrophits are narrow specialized plants and are associated with certain ecotopes. It is theoretically and practically significant to clarify the nature of them during synenesis process.

Materials and methods: The research material is a type of carnation that has been widely spread on the rocks and debrises of the north-eastern part of the Lesser Caucasus and has been well adapted to these areas.

The researches were carried out in the north-eastern part of the Lesser Caucasus, in the mountainous regions of Goshgar and Kepez. These mountain systems have been regarded as a standard for the North-East of the Lesser Caucasus. The data from route and stationary searches were used. Route searches covered mountain rocks, slopes, bare and eroded rocks and debrises from the middle mountain zone to subnival and nival zones. At the same time, floristic, floristic-systematic, theological, botanical-geographical, phytocenological and statistical methods used in Botany are taken into account.

In assignment and naming of plants A.A.Qrossheym “Flora of Causasus” (1950-67),” Flora of Azerbaijan”, 1st book (1961) and A.M.Askerov's " The concept of Azerbaijani flora " (2010), "The concept of flora of the Caucasus", 3rd book (2008) have been used.

Conclusion: Dianthus L. species are typical for dolomite sediments of the Kepez mountain system. Most rock and sedimentary plants are observed at the peaks of the Kepez mountain system.

The rocks are characterized by their unique ecological conditions. Plants grown in the rocks have special adaptability. The amount of solid roots increases and they form in the shape of a pillow. The following species of *Dianthus* L. Spread in the north-eastern part of the Lesser Caucasus:

Chapter: Caryophyllaceae Juss.

Species: Dianthus L. Carnation

D. caucaseus Smith (=D. discolor Smith)- Caucasus. Niddle-rooted, perennial plant, height-20-30 sm, blooms in July and September. Hemicriptophyte In the Goy-Gol high mountain zone, alp and subalpine zones.It has been described from Caucasus. Heliophyte, lapistystophyte, decorative.

D. fragrans Adams Kneedle-rooted, perennial plant, height is 20-35sm, blooms in July and August. Hemicryptophyte, Eucalyptus (Pl.) Goy-Gol, dry up to subalpine zone, on the clay cliffs.It has been described from Caucasus. Kseromezophyte, heliophyte, lapistystophyte, decorative.

D. kusnezovii Marc Kneedle-rooted, perennial plant, height is 5-15sm, blooms in July and August. Hemicryptophyte, Eucalyptus (Sp.). On Dashkesan high mountains, (3200m) rock splits and rock debrises. Heliophyte, optional xmasofit, decorative.

Key words: rock, debr, family, genus, kind, carnation

Bioecological Features of Woodfern Which Exposed to the Threat of Extinction in the North-Eastern Part of the Small Caucasus

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The northeastern part of the Small Caucasus is one of the richest regions of the Caucasus in terms of biodiversity.The woodfern have not been thoroughly studied in the Small Caucasian .At present, the woodfern species takes the first place in humid, tropical and subtropical forests,due to its diversity of vital forms.However, there are rare and endangered species,too.Below is given information about the degree of rarity in line with international standards and taxonomic status and dissemination patterns of woodfern which including to the "Red Book" and exposed to the threat of destruction .

Material and methods: Here, comparative-morphological, systematic, ecological methods have been used. The International Botanical Code (2009) and A. M.Asgarov's book "Azerbaijan's Flora Concern" (Askerov, 2011) is based on the definition of the nomenclature issues. Macrotacson's were determined on the basis of some important sources of classification of woodfen (Pichi-Sermolli, 1977, Smith et al., 2006; Maarten et al., 2011).

The Diva-Gis system was used to achieve ecological parameters in the study area.Hipsometric altitude and range coordinates were measured by Garmin eTex 20 model GPS.

List of woodfern that are exposed to the threat of extinction in the north-eastern part of the Small Caucasus

Family Woodsiaceae (Diels) Herter- family Vudsia

Gender Woodsia R.Br. - Vudsia

1.W.alpina (Bolt.) S.F.Gray, 1821, Nat Arr. Brit.Pl/2-17.-Acrostichum alpinum Bolt / 1790, Fil.Brit.2 ^ 76 -Alp v.

Short root perennial grass, hemicryptophyte, 15-35 cm;spor creating VI-VII. High mountain meadows, rarely in the woods, rocky and stony places. Holarctic. (Rs.)

The species is described in England.

Atlantic, North, Central, South, Eastern Europe, North, South-West, (Turkey, Iran), East Asia; South America, the Caucasus.

Belongs to the category of "those close to danger" included in the 2nd edition of the Red Book of Azerbaijan - NT *

Family Dryopteridaceae R.C.Ching.- Woodfern family

Gender Dryopteris Adans.s.str. - Woodfern

2.D. remota (A.Br.ex. Doell.) Druce.1908, List Brit.Pl.:87; Ackerov, 1982, Dokl. ASAsSSSS, 38.9: 57.-Aspidium remotum A.Br.ex Döll, 1857, Fl.Bad.1: - Edge a.

Long-rooted perennial grass, hemicryptophyte, 60-100 cm, spor created VI-VII.

Kepez and Bozkir highlands, from low to high mountain ranges, humid areas, in shady forests. Holarctic. (Sp.)

The species is depicted in Europe. Central, East, South East Europe, Asia (Turkey), Caucasus.

3.D. filix-mas (L.) Schott.1834, Gen.Fil.: tab.9.-Polypodium filix-mas L. 1753, Sp.Pl .:1090.-Aspidium caucasicum A.Br.1841, Flora: 707.-Dryopteris caucasica (A.Br.) Fr.-Jenk.et Corley, 1972, Brit. Fern Gas. 10.5: 222; Gabr.a. Greuter, 1984 Willdenowia, 14: 153. D.Filix-mas (L.) Schott subsp.caucasica (A.Br.) A. Askerov, 1983, Assistant Professor of Medical Sciences (Tbilisi) 39: 6-D.filix-mas subsp.pseudoriginal (Christ) A.Askerov, 1983, cit.Sc .: 39: 6.- Male a.Long rooted perennial grass, hemicrythophyte, 50-100 cm,spor creating VI-VII, in middle and higher mountain forests, humid slopes. Holarktik. (Pl.)

The species is depicted in Europe.

Atlantic, South, South-East, Northern Europe, South-West (Turkey, Iran), Asia, South America.

Changes of Plant-Associated Bacterial Communities in the Radioactive Contaminated Environment

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Aim of the study: to evaluate the phytopathogenic potential of the opportunistic and saprophytic bacterial microflora of *Linum usitatissimum* and *Oenothera biennis* plants from the Chernobyl Nuclear Power Plant Zone of Alienation.

Material and Methods: In our study dominant forms of bacteria from plant seeds samples grown at a radioactive field located 5 km from the Chernobyl Nuclear Power Plant near the village of Chystogalivka and at a control field in a non-radioactive area in the town of Chernobyl, were isolated and identified. Bacterial strains isolated from the seeds of flax grown at the non-radioactive experimental fields were identified as *Pseudomonas fluorescens* and Gram-variable *Paenibacillus sp.* Isolates from the radio-contaminated Chernobyl area have been previously identified as *Enterobacter sp*. and *Cupriavidus pauculus*. Bacterial isolates from inflorescences of *Oenothera biennis* (Chystogalivka) were identified as *Pantoea sp.* and *Acinetobacter baumannii*.

Results: In adverse environmental conditions there is a tendency to increase the number of opportunistic microorganisms and biotrophs. Bacterial and fungal pathogens form a large group of species, the representatives of which can infect humans, animals and plants. For example, bacterial strains of *Pseudomonas aeruginosa, P. alcaligenes, P. chloraphis, P. fluorescens, P. mendocina, P. monteilii, P. oryzihabitans, P. petrocinogenes, P. pseudoalcaligenes, P. putida, P. stutzeri, P. maltophila, Burkholderia complex (P.) cepacia* from water, soil and plants can cause a diseases in humans. Opportunistic fungi including soil saprophytes and phytopathogens *A. corymbifera*, *A. flavus*, *A. fumigatus*, *A. terreus*, *A. kiliense*, *C. keratinophilum*, *F. oxysporum*, *F. solani* , *F. verticilloides*, *P. variotii*, *S. brevicaulis* and others can be the cause of so-called secondary mycoses. In particular, in urban ecosystems and disturbed forest ecosystems, an increase in the frequency of detection of potentially pathogenic microscopic fungi was noted (Marfenina et al., 2002, Dudka et al., 1994). Conditionally pathogenic microorganisms and biotrophs have advantages over saprophytes and highly specialized pathogens, because they are characterized by high adaptive potential, are more resistant to the effects of adverse environmental factors and can find new host organisms.

The common features of bacteria from plants grown at radionuclide contaminated area are increased synthesis of mucus and encapsulation. It was found that all selected isolates produce catalase, therefore, bacteria were resistant to oxidative stress. The higher virulence of most bacteria isolates from plant grown at radioactive contaminated area compare to the isolates from plant from area without radioactive contamination was established by the phytopathogenicity tests. *Enterobacter sp*. and *Cupriavidus pauculus* bacteria from the flax seeds demonstrated the highest virulence and aggressiveness in all studied test systems (flax, corn, *Arabidopsis thaliana*). Enterobacteria close to agents of opportunistic infections tends to dominate in the conditionally pathogenic microflora from plants grown in the radioactive contaminated environment.

Keywords: stress, anthropogenic factors, pathogen, opportunistic pathogens, biotrophs

Chromatographic Analysis of Fruit Extract of Common Opuntia

(Opuntia Vulgaris* Mill*)

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Aim of the study: Opuntia usual is a sort of plants of cactus family (Cactaceae). Opuntias are widespread in subtropical areas of South America. It is a perennial plant that reaches 4-6 meters height. The first mention of Opuntia we can meet on a book of F.Ernandes " History of New Spain's plants" (1535). Segments of opuntia are juicy, thick, oblong or obovate, grow one from another. Later thorns develop on large mature segments. Moreover, on the areolas of opuntia, except the thorns, yellowish glochidias are developing. Glochidias easily fly away from a cactus and have a protective function.

In ancient days, till America was not discovered by Europeans, a local population used cactus as a meal, medicine, paint raw materials, as green fences and also for making magic mascots and herbs. It is known that before America was discovered by Europeans, people along with a corn, tobacco and potato accepted fruits and young stems of opuntia usual in food. And now opuntia is favorite food plant of Mexicans. According to the researches, stems and fruits of opuntia contain 1-4% of oil, cellulose, carotene, vitamins C, Ca, Zn, Mg, flavonoids,glycoside, ruthin, kempferol.

For curative purpose fruits, seeds, flowers, roots and stems of Opuntia Vulgaris are used.An opuntia is a natural insulin, because it contains K, Ca due to that it can regulate the level of sugar in diabetes.

Materials and methods: The object of experiments was fruits of Opuntia Vulgaris, collected in Absheron in September and October, 2017. Lipids were received from the fruits of Opuntia by the method of extraction. For the receipt of lipids by the method of extraction, the fruits of Opuntia were finely cut and exactly weighted and then wrapped in a filtration paper and fixed into Soksilet machine. Also the process of methylation of fat acids was conducted and as a result methyl ether was obtained at a low temperature that has an ability to vanish. For realization of methylation process, 1 gram was taken from every fraction of lipid and dissolved in 10 mls of ether petrol (70-100 C) and twice stirred in 5 mls of 10 % solution of hydroxide of potassium. Obtained extractions were combined and were neutralized by universal indicator in 1 % solution of chloride acid for the receipt weak sour environment (ph = 50-55). This solution was processed in diethyl solution for three times by combining stages, then is dried up by dry sulfate of atrium and drawn out either.

Terms of chromatography: chromatograph of Agilent Technologies 7890B Network CG System, 5977A inert Mass Selective Detector by mass spectrometer as a detector of Split/Splitless injection-Split, Inlet-pressure 8.2317 psi, Split-10, LowMass-50, HighMass-1000, Threshold 150. 30-meter capillary quartz column of "HP-5MS Ultra Inert" with the internal diameter of 0,25 mm and tapes of immobile phase 0,25 of thickness were used. Temperature condition of column: initial temperature 60C – 5 min stably; raise of temperature 15 C/min to 220C-3 min stably. Methanol solvent was used. Speed of gas- carrier (Ne) 1.2 mls/min.

Keywords: opuntia usual, linolicacid, palmitic acid, gas chromatograph extract.

Climate Changes: the Impact of Desertification and Burning on Flora and Fauna in Bozdag Massive

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Aim of the study: One of the major problems that seriously disturbs world scientists, ecologists and environmental protection from the end of the 20th century is the global climate change. As one of the major consequences of global climate change, desertification is a tragic event for millions of our planet.So, desertification means degradation of soil and vegetation, loss or total loss of their biological and economic productivity.During desertification, fertility is catastrophically degraded, the cattle perish, the water sources dry up, the sown areas are saline, and the sandstorms are "moving" into their dwellings, resulting in poverty, hunger, and disease.

Material and Methods. *Methods for the study of mountain herb were also used in the research.A lot of ecological information had been learned(water system, cover etc.)while studing of the area.The materials were used in the development of materials such as "Флора Азербайджана", "Определитель растений Кавказа", "Флора Кавказа", "Флора СССР", "Flora of Turkey", I and II of the Red Book and others.*

The desertification process in Azerbaijan is mainly due to natural, especially anthropogenic factors in foothills and plains.The average annual precipitation in these areas varies between 150 and 400 mm, and is 3-4 times faster than the surface evaporation. Climate refers to semi-desert and dry steppe.The desertification process is more typical for the Kura-Araz lowland, where the Korchay State Nature Reserve is located.We have seen the negative effects of climate change on the flora and fauna in the Bozdag massif as a result of continuous experiments.Observed annual observations show that the winter months are very cold, windy, spring and autumn are very rainy , and the summer is warm and dry in The Specially Protected Nature Reserves.Recent observations show that in the summer months average temperatures are 39^0-42^0C windy days are more frequent in the previous years.Vegetation development does not continue until the end of the plant due to drying.

Results: Predominance of dry and hot climate in the area and acceleration of the desertification process have a negative effect on wild mammals, gazelles and wild bird fauna in the Korchay State Nature Reserve. Although the species of flora fauna has been adapted to such an environment, they are required to seek food and water resources. They are looking for ways to smuggle. The Tugay Forest fragments in the Kurchay and Korchay Valley play a decisive role in the concentration of active irradiation, but these fragments are also at risk of extinction.Recent observations show that drought and hot winds due to erode in soil and vegetation, destruction of ephemeric plants in 120 hectares of the large desert plains of the area and the desertification process in those zones.

Keywords: flora, fauna, desert, steppe, ephimer

Collection of Technical Plants of the M. M. Grishko National Botanical Garden of the NAS of Ukraine

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Aim of the study: Technical plants of our collection are divided into those containing oil, fiber, cellulose, sugar, inulin, tannin, narcotic, and also are dye, insecticidal, as well as those that serve as raw material for the manufacture of tools, weaving and decorating. Particular attention is paid to the study of biological properties of plants, the potential for naturalization of new introduced plants and the content of economically valuable components. The collection of technical plants is a source of enrichment of species and variety diversity, and also has an important educational value.

Material and Methods: The collection of technical plants involves species from the natural flora of Ukraine and other countries. It contains varieties derived by selection methods, interspecific crosses and the allocation of inbred lines. The research was conducted using field and laboratory methods. To study the introduction, phenology, morphology, anatomy and biochemistry of plants methods of A. M. Grodzinsky, I. M. Beideman, D. P. Protsenko, O. V. Brayon, Z. T. Artyushenko, A. A. Fiodorov, C. M. Ziman, A. O. Nichiporovich, A. I. Ermakov, C. M. Pochinok and others were used.

Results: The collection of technical plants has 161 taxon. It includes plants of 136 species belonging to 86 genera of 27 families. Most of the plants are from families: *Amaranthaceae*, *Asteraceae*, *Brassicaceae*, *Fabaceae*, *Malvaceae*. Grant attention was given to the study of oil and dye plants.

65 samples of oilseeds were collected. A study of introduction and cultivation technology of *Amaranthus* L.. A grade of amaranth Helios with high content of oil and squalene is created. Established biological, morphometric, environmental and biochemical features of *Chenopodium quinoa* Willd. as a source of fatty oil and squalene. Also studied is the productive potential in the culture of the *Lithospermum officinale* L., in the seeds of which contains 15% fatty oil.

Our collection includes 61 sample dye plants from 19 families: *Asteraceae*, *Amaranthaceae*, *Fabaceae*, *Polygonaceae*, *Malvaceae*, *Rubiaceae* and *Solanaceae*. The collection involved plants that are suitable for use as a dye raw food, textiles and eggshell. Along with the availability of suitable pigments overlooked set of biologically active substances. Along with the biological properties of introduced plants studied their potential ability to naturalization.

Acknowledgements: Research performed by 374-NK project of NAS of Ukraine "Ecological and biological basis of the conservation, enrichment and effective use of genetic resources economically valuable plants in Ukraine".

Keywords: technical plants, oil plants, dyeing plants, *Amaranthus* L., *Chenopodium quinoa* Willd., *Lithospermum officinale* L.

Comparison of Main Shoot Stem Deposited Ability of Winter Wheat Varieties at Different Times of Breeding Under Drought

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Aim of the study: Winter wheat is a drought sensitive culture. A drought stress led to decrease in photosynthesis rate and to a smaller formation of photosynthetic assimilates (Medrano et al., 2002; Flexas, 2008). Under the drought, for the grain filling plants can use previously accumulated metabolites. The ability to accumulate reserved assimilates and their use in different varieties can be varying considerably (Ruuska, 2006). Therefore, the genetic diversity of culture plants varieties may be a reserve for improving to drought tolerance.
The aim of the work was to identify features related to the resistance of winter wheat plants to drought, based on comparative studies of the grain productivity of the main shoots and the deposited ability of its stem in high-yielding modern varieties and earlier breeding varieties.

Material and methods: The period of spring-summer vegetation in 2017 was characterized less than the normal amount of precipitation from April to July. Due to the lack of precipitation during period from anthesis to milk-wax ripeness, grain filling was carried out in arid conditions. The object of the study were 6 varieties of winter wheat (*Triticum aestivum* L.): 3 varieties of the last years of breeding (2013-2016): Pridneprovska, Darunok Podillya and Raygorodka and 3 drought-resistant varieties: Odeska 267, Podolyanka and Yednist, which were registered 10-20 years ago (1997-2008). The research was carried out on the experimental field of the Institute of Plant Physiology and Genetics (Ukraine, Kyiv region). The accounting area was 10 m^2 (4 replications). The yield was determined by the direct harvesting method in 4 replications. The determination of morphometric parameters was carried out on 25 main shoots, and biochemical ones in the mean samples formed from these shoots. The grain yield components of the studied varieties were determined on 25 main shoots at full grain maturity. The assessment of the depositing capacity of the stem was carried out by the difference between the dry weight at anthesis and full ripeness.

Results: The yield of the studied winter wheat varieties varied in the near range: from 7,75 to 8,55 t/ha. The highest yield among them had varieties Raygorodka (8.55±0.24 t/ha) and Podolyanka (8.16±0.18). The stem dry matter weight of the main shoots in modern varieties of winter wheat at anthesis varied in the range from 846 to 1096 mg and in varieties of earlier breeding: from 807 to 1007 mg. The highest dry matter weight of the stem at this phase had the variety Raygorodka. The difference of stem dry matter weight of main shoots at anthesis and full ripeness varied substantially between varieties (from 189 mg to 277 mg). Both the high-yielding varieties were differed from others by a higher difference (on 15-45%) of stem dry matter weight at these phases. A significant reduction of dry matter weight at full ripeness, as compared to the anthesis, may indirectly indicate a larger outflow of assimilates from the stem. The strong correlation between the grain weight of main shoots with the difference of its stem dry matter weight at anthesis and full ripeness (r=0.84±0.27) confirms that the high productivity of winter wheat varieties is related to their ability to deposit assimilates.

Acknowledgements: The publication contains the results of research conducted within the framework of the project funded by the National Academy of Sciences of Ukraine No. III-l-17 "Investigate genetic and physiological basis of drought-tolerance of wheat and create competitive genotypes resistant to adverse environmental factors caused by global climate change" (2017 -2021 years).

Keywords: *Triticum aestivum* L., stem dry matter weight, drought, yield.

Confrontation as a Form of Environmentally Oriented Behavior

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Aim of the study: is to research the confrontation as a form of environmentally (ecological) oriented behavior.

Material and methods: The article is based on confrontation as a form of environmentally oriented behavior. Materials and literatures in different languages had been involved to the study. Critical and comparable methods had been used during the research.

Introduction: The article is based on confrontation as a form of environmentally oriented behavior. Ecological behavior is a consequence, the realization of the constructive content of ecological consciousness and is largely determined by the peculiarities of the psychological field that is peculiar to one or another personality. Like ecological consciousness, ecological behavior is always strictly individual, reflecting the unique features of the individual. However, considering all the many forms and types of ecological behavior, some common elements, features and connections can still be found, and a number of basic differences can be identified that allow some classification of behavior. One of the social aspects of the society's perception of its own in the wilderness is a disputable consistent with the evolutionally-adaptive social, ecological, and substance abuse. The simplistic society can bring one of the dilemmas, the presumptive and acceptable variants of the dilemma, and that's why publicity in the direction of a more effective adaptive approach changeable conditions or circumscribed continuous passage moving, which actually makes the society disappear. Efficiency stage of adaptation behavior can be adapted as a positive identity of indicator, defining the impotence of the functioning society. When it comes to socio-politics, there is no need for an individual, just as one of the most prestigious of being "superior" to the rest of the world.

It is explained as anthropo - (socio-) centric requirements. However, exclusively the excitement of wine is the development of the personality egoism, which is specific to the concrete society, which is presented in a refined phenomenon. In the meanwhile, the "superiority" of the society is driven by this, it can be said to be a counterbalance to the complex of nonviolence.

The development of personality in the general - social world is formulated as a "blessing" with the possibility of socializing with its own possibilities of supply, which is actually driven by the control of the "counterfeit" external world. More than ever, the "noble" feeling of the "free", the "historic" in the history of the "affluent" of the rest of the world, is the place where the "home" is replaced by the subversive "vicious" external world.

It should be noted that the behavioral reaction of the society in relation to external influences manifested in one form or another is nothing but an expression of the society's desire to ensure its own security (or to raise its level) by taking necessary attempts from the social point of view to preserve necessary for this means and conditions. However, all these attempts uniquely have a limited, we might say, predetermined character: they can only be successful as much as the actual situation of interaction that "arises" itself.

The state of a complete constant "psychological dependence" to the danger (real, presumed, or imaginary, illusory), the inevitability of its expectation, the dependence of all possible on the natural situation factors inevitably leads to a state of stress.

Two main forms of behavior are described quite well: reactions to danger: aggression and flight. Note that each of the named forms behavior in its own way mobilizes the impulse to security. In this case, if aggression "does" this through striving (very often finding its own real embodiment) to the ruthless destruction of the alleged source of danger, then "flight" is aimed at "eliminating" the possibility of an alleged collision with the object of the anticipated threat.

In addition, if the value (more precisely, the totality of its undesirable for socium characteristics) signal of the alleged threat is not enough, the growing, growing tendency towards the manifestation of aggressive behavior, otherwise the case (that is, if a socially significant estimate intensity of the above-mentioned

threat defines it as significant), then a counter plant is naturally formed the opposite of the previous trend - the tendency to "escape".
Thus, both aggression is as possible (acceptable, acceptable, etc.) forms of social behavior directed at the surrounding environment that both the alleged, and at already known levels of the alleged danger.

Results: Ecological behavior is a consequence, the realization of the constructive content of ecological consciousness and is largely determined by the peculiarities of the psychological field that is peculiar to one or another personality. Like ecological consciousness, ecological behavior is always strictly individual, reflecting the unique features of the individual. However, considering all the many forms and types of ecological behavior, some common elements, features and connections can still be found, and a number of basic differences can be identified that allow some classification of behavior.
The application importance of the article: could be used in seminars and lectures at higher education institutions and at schools.
Key words: Confrontation, ecological, behavior, psychology, escape

Conjunction of the Molecular, Cytogenetic and Genetic Biomarkers as a Predictor of Vulnerability to Medical Radiation Treatment

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In our studies reported previously, blood samples were obtained voluntarily from various groups; healthy controls, prostate cancer patients, and the thyroid diseases patients exposed to Iodine-131 (diagnostically and therapeutically). Blood samples and isolated lymphocytes, were exposed *in vitro* to high challenging dose of X-rays. Before and right after *in vitro* irradiation; the DNA Repair Competence Assay and cytogenetic methods (chromosome aberrations, sister chromatid exchanges, micronucleus frequency were investigated. Strong variability between individual's vulnerabilities to ionizing radiation was observed in responses to both; high challenging dose of radiation, as well as to diagnostic and therapeutic Iodine-131[(1-3)]. Therefore, in this study, the polymorphisms of XRCC1(194) and XRCC1(399) genes, that are engaged in base excision and DNA single strand breaks repair, and XRCC3(241) involved in DNA double strand breaks repair *via* homologous recombination, were investigated in randomly chosen samples from 60 subjects. Results of investigated biomarkers stratified according conjunction of polymorphic alleles have shown insignificant variability between all subjects in the DNA sensitivity to irradiation, detected immediately after challenging exposure in 4^0C. In contrast, high differences are observed between subgroups stratified according conjunction of polymorphic alleles of investigated genes; in levels of biomarkers related to DNA repair (DNA RCA) and to percentage of cells with significantly elevated number of sister chromatid exchanges (HFC – high frequency cells) as well as biomarkers of cancer risk. One of the highest percentages of not repaired DNA damage evaluated by the DNARCA, and frequency of chromosome aberration, were detected in lymphocytes of prostate cancer patient with homozygous genotype at XRCC3-241/C and XRCC1-194/C, and heterozygous at XRCC1-399A/G locus. Influence of age, gender, and cancer incidence in the immediate family, were also investigated. Obtained results confirm strong influences of investigated genotypes on the repair efficiency of DNA damage induced by high doses of therapeutic irradiation, or accidental exposures, as well as on the levels of biomarkers, that are predictor of cancer risk.

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Cosmarium pseudoretusum F. Ducellier New for Ukraine, Rare for Europe

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Aim of the study: Within the framework of Chernihiv Polissia desmids (Zygnematophyceae, Streptophyta) diversity study there was found one noteworthy Cosmarium species. It is its first occurrence for Ukraine flora and it was found only in six countries of Europe before. The aim of this research is to provide diagnosis of this species including photos and drawings, and make comparison to description given in papers of European algologists. Ecological characteristics shall be discussed as well.

Material and Methods: Study Area. Lake of Magistratske situated on the left bank of Desna River in Chernihiv Polissia (51° 28' 26.1" N 31° 20' 12,3'' E).

Sampling and analyses. First samples were collected in 2016 and in 2017 there was performed a series of sampling over the course of 5 months from April to August with intervals of 2-3 weeks. There were collected 24 samples. The samples were taken from the euphotic zone of the lake by scraping off periphyton from old plants and by squeezing water plants biomass floating on the water surface and collecting the resulting liquid. The samples were fixed with 4% formalin. Some preliminary examination was done using live samples. Examination was done using Olympus BX-51 microscope, photos were done with Canon EOS 1000D. Identification of this species was done using paper of Jan ŠŤASTNÝ (2010).

Results: *Cosmarium preudoretusum* F. Ducellier was found only in the Lake of Magistratske in Ukraine. In Europe it was found in Austria (Lenzenweger 1999), Czech Republic (Stastny 2010), France (Kouwets 1999, Anon. 2017), Germany (Ludwig & Schnittler 1996, Paul, Stastny & Doege 2017), Netherlands (Coesel 1991), Turkey (Europe) (Sahín 2005) according to Guiry, M.D. & Guiry, G.M. 2018. AlgaeBase. We were observing samples collected over the period of five months of 2017 and studying population of Cosmarium preudoretusum F. Ducellier in the lake of Magistratske. Water pH is 7,3 – 7,5. Dimensions of cells are similar the ones specified by Jan ŠŤASTNÝ (L: 26-28 μm, B: 20-21 μm, I: 6,5 – 7,5 μm). It should be noted that there were found cells with well-developed papillate outgrowths at the basal angles and some cells with barely visible papillate outgrowths. This can be explained by morphological variability within population. There were made photos of live cells and cells with more and less visible species distinguishing characteristics (papilate outgrowths at basal angles). New desmids species is added to the flora of Ukraine. Area of *Cosmarium pseudoretusum* F. Ducellier habitat is now extended with the seventh country in Europe.

Keywords: desmids, *Cosmarium*, Chernihiv Polissia, Ukraine

Cytomixis as a Mechanism for Increasing Heterozygosity and Genetic Diversity in Plants

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Aim of the study: Despite significant progress in study of cytomixis its role as mechanism to increase genetic diversity and speciation in plants are still not clear. We have studied the assignment and actions of cytomictic chromatin in meiosis as well the mechanisms of rearrangement of microsporocyte and microspore genotype.

Material and Methods: Several monocotyledonous species with spontaneous cytomixis were investigated: Saffron lily (*Lilium croceum* Chaix.), Welsh onion (*Allium fistulosum* L.), Onion (*Allium cepa* L .). Light and fluorescent microscopy were used.

Results: Based on the cytogenetic analysis we conclude that in microsporocytes of these species are formed additional or extra chromosomes presumably of a cytomictic nature. The markers of additional chromosome are the aberrations, weakened synapsis between homologues and synapsis with other chromosomes, including bivalents of the basic karyotype with the formation of secondary chromosome associations, which allow some extra chromosomes to be fixed in the meiotic apparatus. Stabilization of the microsporocyte karyotype is achieved through a wide arsenal of ways: the emission of aberrant chromosomes beyond the meiotic spindle, the differential distribution of chromosomes in the ana-telophase and the asymmetry of cytokinesis, the formation of dyads, triads or pentads, the programmed cell death of one or two microspores per tetrad, as well as by cytomixis. A part of extra chromosomes can adapt in the genome of microsporocytes as evidenced by polymorphism of pollen grains. It should be noted that the above events can be caused both by cytomixis and by the potential hybrid nature of these species.

Keywords: cytomixis, microsporogenesis, extra chromosomes, *Lilium croceum* Chaix., *Allium cepa L. , A. fistulosum* L.

Determination of Plant Life Activity Indicators on The "Yeni Kend" Water Reservoir

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Aim of the study: Biodiversity, first of all, reflects the theoretical basis of evolution as one of the fundamental concepts of theoretical biology. Cultuvated and wild biodiversity fall under impact of natural, environmental, ecological and neurogenic effects all the time. Therefore, species that need special flora protection are to be found in order to preserve plants.

The "Yeni kend" water reservoir area was subjected to 80-85% of technogenic contamination, and a number of unspecified species for area have been discovered. Therefore, the study of life activity indicators of some species in "Yeni kendl" water reservoir area was set as a goal. Localities of some species of *Artemisia* genus which is unusual for water surroundings, settled in the form of pallets.

Material and methods: The study was carried out around the "Yeni kend" water reservoir in 2016-2017. For this, roots from 10 plant examples were marked, measured, average length, diameter and leaf number of each root were defined.

Life activity indicators of plants (LAI) [Rusakov E.G. Study methods of flora and vegetation] is defined by the following formula:

$$HFG = \frac{100n_1+70n_2+40n_3+5n_4}{N}$$

Here: n_1, n_2, n_3, n_4 – the number of healthy, weakened, seriously weakened and drying plants; 100, 70, 40, 5 – life activity level coefficient in percentage of the number of healthy, weakened, seriously weakened and drying plants, N – the total amount of plants in the stasis.

Results: The "Yeni kend" water reservoir area is connected to Kura river, Ganjachay and Goshgarchay valleys. The rising and falling water here which happened very often and other anthropogenic effects caused changes in the washing slopes, the growth of erosion proceeses, changes in the structure, composition and productivity of flora and herbicides. As a result, the forest and shrubs are gradually lessened, some of the species have been sorted out completely, invasive plants, jungles emerged on their area. During the study, 36 types of "healthy" species having a 100-80% coefficient, 12 species were "weakened" by 58-70%, 17 species were "seriously weakened" by 49-20%, and 19 species were considered "completely destroyed" by 19% and lower in the area flora. *Festuca sulcata L., Paliurus spinachristi Mill, Medicago sativa L., Hordeum bulbum L., Phleum paniculatum Huds.* types according to literature were not seen in the area even though it is widely spread in the area, it has been completely destroyed.

Scientific results of research materials on these species which allows you to analyze "Human-nature-ecological situation" triple relations results, at the same time, on the basis of plants response, there are conditions for substantiated development of combat measures. In this connection, proper use of the vegetation cover of the area, research on the molecular-genetic basis of Xerophyte plants adapting to the aquatic environment, as well as fertility of contaminated plants and restoration of the initial phytosyncope, eco-geotechnical investigations has great importance on theoretical and methodological bases on the "Yeni kend" water reservoir area environments located in the Little Caucasus botanical-geographical region.

Keywords: technogenic contamination, plant life activity indicators

Development of Potential Risk Assessment of the Transgenic Plants for the Evaluation of Practical Perspectives for their Adoption in Ukraine

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Aim of the study: Development and adoption of universal system for scientifically based risk assessment of GM plants is extremely important taking into account wide and controversial societal attitude to new genetic engineered plants not having scientific background in most cases. Especially this problem obtains new angle for consideration with development new breeding technologies and development of synthetic biology tools. On one hand such system must be the optimal in the terms of time consumption and cost efficiency, and on other hand it should provide the guarantee of necessary safety level. Respectively, this study is devoted to the development of clear scientifically based system for evaluation of an environmental (ecological) risk of transgenic crop field release in dependence of possible vertical gene flow from transgenic plants to sexually compatible species.

Material and Methods: This research represents an attempt to adopt and to develop for Ukraine a system of pre-release risk assessment of GM crops after the idea of F.H. de Vries developed by K. Ammann. Such approach is based on integrated information (specific codes) on hybridization potential, dispersal of diaspores, frequency of the distribution of respective species. The codes are divided by steps on the indexes from lowest risk up to highest risk. After an evaluation of all codes, their combination provides an opportunity to estimate potential influence of transgenic plants on wild flora. Six categories of risk probability have been developed from “no effect” to “substantial and widespread effect”. Accordingly to the risk category the conditions of field releases, terms of monitoring and level of containment of transgenic species belonging to these categories can be defined.

Results: In the case of Ukraine such preliminary risk assessment was done for corn (no effect), soybean (not effect), oilseed rape (substantial but local effect), sugar beet (minimal effect), potato (no effect), camelina (substantial but local effect) and wheat (minimal effect). The considered approach can be used in the risk assessment for any novel plant varieties developed using new breeding techniques.

Acknowledgements: This research was conducted out under the project “Scietific principles of the usage of GMO detection and identification methods in agricultural plants and food products derived from them” of Natl. Acad. of Sci. of Ukraine (2015-19).

Keywords: GM crops, environmental risk, risk assessment, new breeding technologies.

Digenea Biodiversity (Trematoda: Digenea) of Freshwater Slug Molluscs in Forest Biocenosis of Ukrainian Polissya

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Aim of the study: Contamination by digenea is one of the most important natural factors usually causing the regulation of natural composition of forest animals. Digenea belong to Trematoda class and are endoparasites of vertebrates and spineless animals. They are characterized by a complicated life cycle connected with changes of intermediate and amfimict generations and with the change of animal hosts. Freshwater molluscs are the first obligatory intermediate trematoda hosts, poikilothermal animals serve as others (metacercariae), if any. Vertebrates of different classes are definite hosts of digenea. In view of the above the conducting of long term planned research would be reasonable for revealing digenea diversity circulating on forest biocenosis of the region. Obtaining adequate data will enable not only to set species composition of digenea, but to determine the circle of definite hosts and to estimate their role in parasites circulation and the place of these vertebrates in ecosystems of the region as well. Thus, the aim of our research was to determine the species composition of digenea at cercariae stage in freshwater molluscs in forest biocenosis of the region.

Material and Methods: Our own molluscs collection from 2016 – 2017 in 5 water reservoirs served as research material. 873 samples of Gastropoda molluscs class have been examined on the availability of trematoda invasion. Molluscs have been collected using commonly accepted methods. The morphology of different molluscs development stages has been studied on living samples mostly, applying vital stains. Cercariae measurements have been performed on living and on the samples fixed by 70^0 ethanol.

Results: The results of the research revealed that 16 digenea species have definite hosts among the representatives of Amphibia, Reptilia, Aves and Mammalia. Among registered digenea larvae 7 species or 43.8% from the total amount parasitize representatives of Aves class and belong to 5 families, the representatives of *Echinostomatidae, Strigeidae* parasitize birds only, while the representatives of *Plagiorchidae* and *Notocotylidae* parasitize birds and mammals as well. Digenea, the final hosts of which are representatives of Aves class belong to 5 families *Echinostomatidae* (Echinostoma revolutum, Echinoparyphium aconiatum, Echinoparyphium recurvatum), *Strigeidae* (Cotylurus cornutus), *Notocotylidae* (Notocotylus attenuaus*), *Plagiorchidae* (Plagiorchis elegans*), *Cathemasiidae* (Cathemasia hians).

Digenea finishing up their development cycle in mammals are represented by 6 species in our collection (37.5% of all registered species). They belong to 5 families: *Paramphistomadae, Fasciolidae*, *Plagiorchidae*, *Notocotylidae Alariidae*. The representatives of *Facsiolidae*, *Paramphistomatidae*, *Echinostomatidae, Notocotylidae*, *Strigeidae* and *Alariidae* which are the agents of dangerous diseases in wild animals and mammals have epizootological importance in the region. Systematic arrangement of digenea species is registered in slug molluscs the final hosts of which are representatives of mammals: *Paramphistomatidae* (Liorchis scotiae), *Fasciolidae* (Parafasciolopsis fasciolaemorfa, Fasciola hepatica), *Notocotylidae* (Notocotylus attenuaus*), *Plagiorchidae* (Plagiorchis elegans*), *Alariidae* (Alaria alata).

4 digenea species (12.4% of all registered species) have been revealed as those that finish up their development in representatives of Amphibia class. They belong to three families: *Plagiorchidae* (Opisthioglyphe ranae, Haplometra cylindracea, *Haematoloechidae* (Haematoloehus asper) and *Diplodiscidae* (Diplodiscus subclavatus). The species O. ranae, D. Subclavatus occur also in reptiles. The digenea – Lepthophallus nigrovenosus (6.3%) from *Plagiorchidae* family finishes up its development only in the representatives of Reptilia class. P. elegans outstands from the diversity of the examined digenea species, whose definite hosts can also be reptiles alongside with mammals and birds.

Thus, 11 digenea species (68.8% of the total parasites revealed) finish up their development cycle in homoeothermic animals. The obtained results testify to the fact that the major amount of the revealed digenea in forest biocenosis parasitizes homoeothermic animals.

Research is done for my own expense.

Key words: digenea, cercariae, freshwater molluscs, Ukrainian Polissya.

Distribution of Intestinal Parasites in Hens in the Western Region Farms of the Azerbaijan Republic

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Aim of the study: Many studies have been conducted to raise productivity in individual and farm poultry farms, to reduce the rate of infection. Various pathophysiological, biochemical and functional variations occur in internal organs of the birds, blood lymphatic vessels and gastrointestinal tract from mechanical and toxic effects of parasites.As a result, the resistance of the bird diminishes and conditions for the occurrence of infectious disease.This, in turn, leads to the massive destruction of various birds in bird farm.As a result of timely and well-coordinated combat measures, parasitic illnesses can avoid damage from harming the country's economy.In the meantime, treatment and prophylactic measures should be planned at a planned pace to eliminate diseases spread among animals.

Materials and methods: Parasitological studies were conducted in different seasons of the year in the individual and farms of Dashkesen, Gadabay and Agstafa regions, which are considered to be economically viable in the western part of Azerbaijan in 2015-2016.Feeding in verious conditions,848 analisys have been taken from hens in different age groups and it have been analised for helmint eggs and larvae,as well as for oocytes of eimery.Also,patient anatomic cutting have been done in 68 dead individual and farm hens,gastric helmetologically has been analised,itching from the mucous membrane has been taken of the thin and intense ,the development of the oocytes of the primitives was studied.Analys samples were examined by the method of I.Kovalenko. Species of helminth eggs according to morphological signs. S.Daxno and amount 1 gr of eimeria oocytes was determined in anays samples according to the methods of A.Chertkova.

Results: According to parasitological studies conducted in individual and farm farms in the western region, chickens are infected with helminthesis and eymeriosis.According to the results of the tests, helminths were found to be spread in Ascaridia galli, Capillaria sp, Heterakis gallinarum, Trichostrongylus tenius, Raillietina tetragon species and Eimeria tenella, Eimeria maxima species.Apparently, intestinal parasites have been widely spread in hens in researching farms .While the examination, it was found that the chickens was more likely to infect the parasites than the old hens.Also, chickens, which were freely circulating in courtyard areas, were more intensive with intestinal parasites than those detained in the closed areas.The main reason for the spread of parasites is the availability of favorable conditions for their development.

That is, the presence of all three factors of the invasion chain - the source of the disease, the transmitting factor carrying it and the infection-sensitive organism - allow the spread of parasitosis.Therefore, in preventing the spread of gastrointestinal tract in chickens, proper treatment and prophylaxis is one of the most important issues.

Key words: invasion, helminth, eimeria, hen, parasite, oocytes

Early Spring Flora of Small Caucasus Territory (Azerbaijan)

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Aim of the study: Early spring flora was studied in various ecosystems of the Small Caucasus botanical-geographical region of the Azerbaijan Republic (arachnid and arid plants, aran and peanut rhinos, high-grass and grass-brown rhinos) and their importance for forage purposes was assessed.

Material and Methods: The research work will be carried out in three natural ecosystems of the Small Caucasus in the years of 2014-2016, including the following: Red Samukh, Palanteken, Bozdag, Akar-bahar Ridge; aran and peanut rhinos (Bozkir plain, Ortaceyancol, Çobandag); high-mountain-grass and meadow-grass rails (Goygol-Yellow rock, Dashkasan highland meadows, Gadabay valleys) and early spring flora was determined.

Results: The early spring at the territory is being observed at various period of time depending of the height. Though, at the middle mountain area it is observed at the end of March, beginning of April, at the high mountain area it is observed from the beginning of May. The spring flora and vegetations that it produces are ephemers and ephemeroids which essentially have short vegetation period. This time is being considered as the period of feeding of animals by fresh herbs from aran up to the subalps.

The basis of spring plants is ephemeral. While the aridity begins the ephemeral creatures finish their life cycles and continue their lives during the aridity in the form of fruits and seeds. These plants can be classified as Viola L. and Draba L. species. Ephemenoids are the first and last spring vegetations which after growing of fruits or seeds continue their lives during the aridity period under the soil in the form of bulb, ball or carrot. Generally, the vegetation period of these plants varies from 1.5 to 2.5 months. The beginning of the vegetation period can be dramatically changed due to the winter season's continuity. Moving towards upland the continuity of the winter season is being increased.

The beginning of the vegetation period of plants can change year by year due to the climatic conditions. Though, in 2014-2015 the coming of spring in middle mountain territory began at early April, but in 2016 due to the mild climatic conditions the coming of spring began at early March. Even at the middle of February (15-16) it was observed the first blossoms of almond (Amygdalus fenzliana Lipsky) and merendera (Merendera trigyna).

As a result of research, 28 varieties of flora related to the early spring flora of the region were identified, among which the Brassicaceae Burnett, Asteraceae Dumort are majority.

Each substrate has its own early spring flora and fauna. In general, the basis of the early flora for all substrates consists of xerophytes type of vegetations. The melting of the snow layer causing the growth of plant species such as: Gagea alexeenkoana, G. Carolli-Kochii Grossh, G.dubia A.Terracc, Puschkinia scilloides Adams, Viola odorata L., Viola occulta Lehm, Taraxacum desertorum Schischk., Merendera raddeana, M.Trigyna, Fritillaria curdica Bois. & Noe, F.caucasica and others. However, most of these species do not have the forage significance.

Key words: Small Caucasus, early spring flora, forage crops

Ecological Behavior as a Socio-Psychological Phenomenon

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Aim of the study: the goal of the study is to research ecological behavior as a socio-psychological phenomenon.

Materials and methods: during the study author involved literatures and materials in different languages, conducted her study using comparative and critical methods of analyzes.

The formation of a qualitatively new, more promising, than nowadays existing, the opposite way of seeing, perceiving, comprehending and the experience of the phenomena of the surrounding world should include:

- the requirement for an immediate fundamental change in character relations of society to natural reality, what should become the beginning of a new evolutionary state of the biosphere, in which a reasonable human activity will be a decisive factor in its development;
- the requirement for an immediate, fundamental revision traditionally which is based solely on highly questionable the principle of "socially significant utility" of the social point of view concerning the meaning and meaning of not only the surrounding society, but also the phenomena taking place in it, and events towards a more general and a more justified principle - the principle of "reasonable
expediency "(formation of" no sphere ");
-The demand for a qualitatively new, reflective developed at the present time within the global ecological system "society - the natural environment" a situation more objectively realized humanity, and, consequently, in the scientific-logical and moral-ethical a more justified assessment of all that is happening. The above requirements themselves, in turn, should Find your own adequate reflection in all areas without exception. socially conditioned activities carried out by mankind, thereby creating possibly more optimal conditions aimed at ensuring the process of harmonization of the relationship between the human community and its natural environment, that is, the formation of state, which a number of authors take as a phenomenon "Ecological culture".

That, in turn, should create optimal conditions for functioning in a different plane - the plane of life society as a whole. It should be recalled: until recently, as a generally accepted in research circles engaged in this issue (and not only in them), there was a statement according to which The ecological problem is an exclusively fruit of not quite reasonable (?!), irrational management of society (consisting, among other things, exclusively from "reasonable" beings - "homo sapiens") of one's own production-converting (practical, technical-technological etc.) of activities related (and actually conditioned) almost completely with the satisfaction of his own (that is, society) material needs.

Therefore, all actions taken without exception - attempts to find possible ways out of the created environmental crisis and avoidance of an impending ecological threat were only in this area, and possible and prospective options environmental problems were associated with "intensity" and "purposeful" implementation of numerous activities, aimed at eliminating undesirable phenomena precisely in this sphere. In a certain sense, this was facilitated, as it turned out, in principle, an erroneous, but widely held view, according to which the progressive development of society supposedly must have been accompanied (and will be accompanied by) the same degree of degradation the environment of its habitat - the natural environment.

However, this opinion can’t and should not be accepted as a indisputable approval. Rather, on the contrary, it is possible to nominate a number of quite well-founded (both scientifically and simply from an intuitive logic) of assumptions, if (not to take off from humanity responsibility for the current state of affairs in the global system "society - environment, "then, at least, explaining mainly the objective nature of their folding and thereby facilitating the "guilt" of humanity for the emergence of a range of issues, either otherwise related to environmental issues:

- Firstly, the above is, let us say frankly, not quite correct in strictly scientific plan, the consideration is entirely based on a more general position adopted in modern systemology regarding the nature of relations between open systems in general, according to which an increase in the volume of useful "quality" in one such system is inevitable leads to an increase in entropy (degradation, decrease in volume useful "quality", etc.) in another (in this case, supporters of the above statement, as two such systems, society is taken, with one side, and its natural environment, on the other).
As an objection to this provision, one can say the following: a society can't be represented as independent system, which is opposed in the above scale own, environment.

Results: The paper is based on Ecological vision as a social - psychological phenomenon. So, the phenomenon of ecological consciousness is a complex multilevel dynamic system, where the very content of environmental consciousness. The identification of these contradictions is one of the most urgent tasks modern sciences, revealing these contradictions as the main variables ecological consciousness; we will learn to recognize the essence of true mechanisms ecological behavior.
The importance of application: could be used in lectures and seminars at higher education institutions and at schools.

Key words: phenomenon, ecological, culture, vision, psychological

Effect of Drought on Lipid Composition of Maize Root Plasmalemma

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Aim of the study: Corn is one of the most important cereals grown worldwide and it is a good model for study of adaptive mechanisms to drought. Drought caused by water deficit is probably the most important environmental factor that adversely affects plants. Many plants have developed different mechanisms to reduce the effect of drought, including morphological, regulation of membrane permeability. Plant resistance to drought depends on the membrane lipid complex which provides their functional activity and stability. Our aim was to reveal biological effects of moderate water deficit on plasmalemma lipid composition in roots of two *Z. mays* varieties: “Dostatok” (drought resistant) and “Pereyaslavska” (moderately drought resistant).

Material and Methods: Plants were grown in containers on sand substrate for 21-22 days under 80% relative field capacity for plants (control) and 30% (experimental water deficit). The microsomal fractions enriched by plasmalemma were obtained from maize roots by two-phase aqueous polymer technique. Lipids were extracted from plasmalemma and their composition was analyzed by reversed-phase high performance liquid chromatography using Agilent 1100 HPLC system. The provisions of phospholipids in the chromatogram was determined by standard drug PL soybean seeds and sterols - standard cholesterol. Purity of fractions was determined by the number of stained vesicles formed from plasmalemma.

Results: The membrane lipids are mainly phospho-, glycolipids and sterols, the ratio of which is different in two varieties according to varieties of maize under different water supply. Triacylglycerols were also detected. Water deficit causes the increase of estimated sterol proportion in fractions of plasmalemma: in 32.6% of total lipids for “Dostatok” and in 27.5% of total lipids for “Pereyaslavska” variety. This indicates the stabilization of the membrane under water deficit via decreasing its fluidity, which may occur due to limitations of ion transport. In our experiments, water deficit led to decrease of total amount of glycolipids in both varieties. This phenomenon due to the inhibition of cell signaling function. The major phospholipids were: phosphatidylcholine (PC), phosphatidylethanolamine (PE), phosphatidylinositol (PI) and phosphatidylglycerol (PG). Following water deficit, we observed a reduction of these phospholipids. In plasmalemma, the composition of main classes of phospholipids also was changed differently. Dehydration caused a sharp decrease of major phospholipids, especially PC and PE. In general, “Dostatok” appeared to be more adaptive to water deficit. Changes in the lipid composition are important for determination of adaptive responses. Revealed changes in lipid composition depend on the stability of the variety and are implemented by stabilized membranes aimed at adapting plants to the environmental conditions.

Keywords: drought, plasmalemma, lipid composition, roots, *Zea mays*.

Effect of Pre-Sowing X-Ray Irradiation of *Chamomilla recutita* L. Seeds on Accumulation of Flavonoids in Herbal Material

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Aim of the study. Pre-sowing irradiation of seeds is proposed for use as a factor capable of modifying the accumulation of secondary metabolism products by medicinal plants. The purpose of the study is the selection of doses for X-ray irradiation of *Chamomilla recutita* L. seeds, which will result in an increase in the synthesis and accumulation of flavonoids in herbal material as well as biomass increase.

Material and Methods. X-ray irradiation of seeds, extraction of flavonoids, quantitative evaluation of the content of flavonoids in extracts using spectrophotometry (SF), qualitative and semi-quantitative analysis of extracts using high-performance liquid chromatography (HPLC) were used.

Results. It is shown that pre-sowing irradiation of chamomile seeds in the range of 5-50 Gy leads to an increase in the production and accumulation of flavonoids in comparison with control, and an increase of the dry mass of pharmaceutically valuable raw material (inflorescences) per unit of cultivation area. HPLC analysis of extracts showed that the qualitative composition of hydroalcoholic extracts of *Chamomilla recutita* L. inflorescences did not change, thereby it can be concluded irradiation of seeds do not induct biosynthesis of new compounds. The obtained results confirm the possibility of pre-sowing X-ray irradiation of *Chamomilla recutita* L. seeds in the range of 5-50 Gy as a modifying factor in order to increase productivity and pharmaceutical value of the medicinal raw material.

Keywords: *Chamomilla recutita* L., flavonoids, ionizing radiation, pre-sowing treatment, radio stimulation.

Effects of Temperature Stresses on Winter Wheat *Triticum aestivum* L. Mesophyll Cells Ultrastructure

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Winter wheat represents ~95% of the wheat crop in Ukraine It is typically sown in autumn and harvested in July of the next year. With the global climate change, the unpredictable winter conditions can severely affect the quality of the crop. Temperature regime is one of the key environmental factors, which determines the patterns of plant growth and development, affects its productivity.

Aim of the study was to analyze the effects of short-term high (+40°C, 2 h) and positive low (+4°C, 2 h) temperature stresses on ultrastructural characteristics of mesophyll cells in leaves of heat- and frost-resistant winter wheat cultivars and to elucidate a possible role of ultrastructural rearrangement in the formation of plant adaptive strategy.

Material and methods: 14-day-old winter wheat plants of the heat-resistant cultivar Yatran 60 and frost-resistant cultivar Volodarka were tested. Electron-microscopic studies were conducted using leaf cuttings from the middle part of the second leaf, 1-2mm in size. Samples were preliminarily fixed with 2.5% glutaraldehyde in 0.1 M cocadelate buffer (pH 7.2) under a vacuum infiltration at room temperature (1 h), then at 4°C for 4 h. Samples were flushed in the same buffer and post-fixed with 1% solution of OsO_4 in 0.1 M cocadelate buffer (pH 7.2) at 4°C for 12 h. To dehydrate samples, ethanol solutions at increasing concentrations were used and after acetone treatment they were put in the epoxide resin mixture Epon and Araldit. Cuttings obtained using the ultra-microtome LKB-8800 (Sweden), were analyzed by means of the electron microscope JEM-1230 (JEOL, Japan). To study cells and organelles morphometrically, the software UTHSCSA Image Tool 3 (USA) was used, applying scale of electron microscope images.

Results: We have shown that under short-term heat shock the chloroplast stroma of the heat-resistant variety Yatran 60 intensively formed plastoglobules and the number and size of starch grains increased. In mitochondria the hyperthermia resulted in the formation of developed cristae. Under short-term cold stress we observed some decrease in crista volume and organelles swelling. After hyperthermia the starch grains volume in the chloroplast stroma of the frost-resistant variety Volodarka decreased and multiple lipid drops were formed in cytoplasm. Chloroplasts acquired a more rounded shape. There was observed a partial disruption of the thylakoid membranes integrity and stroma lamellae deformation. A cold stress caused some increase in the volume of cells and chloroplasts but following a low temperature effect no destruction of thylakoid membranes occurred. Thus, the obtained results showed that changes in the ultrastructure of the winter wheat leaf mesophyll cells, which occur during the first hours of temperature stresses, allows to attributed them to the factors involved in the formation of plant adaptive strategy

Acknowledgements: The study has been conducted within the framework of the project «Phytohormone system of the new genotypes of *Triticum aestivum* L. and their wild ancestors affected by extreme climatic factors» with financial support from the National Academy of Sciences of Ukraine

Key words: *Triticum aestivum*, temperature stress, chloroplasts, mitochondria, plastoglobule, lipid drops.

Epigenetic Polymorphism Across Crop Populations is Basis of Its High Adaptive Capacity

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Aim of the study: The objectives of multi-steps researches was reveal the main way of crops' biological diversity formation**,** possible epigenetic mechanisms of seeds germinate asynchrony, the estimation of biological sense of this phenomenon and possibilities of application at breeding.

Materials and methods Assessment of the level of epigenetic polymorphism in the population of wheat and maize seedlings was carried out using DNA restriction analysis with subsequent PCR and calculation of "epigenetic distance" between profiles of DNA methylation of seedlings with different germination time.

Results. Four series of studies have established a relationship between the variation in the germination time of seeds of one species, variety, and yield with their epigenetic polymorphism manifesting in a variety of DNA methylation profiles of plants originating from them. It was shown that epigenetic differences in the seedling sample are associated with both different resistances to stress factors and their adaptive potential. The use of a quantitative assessment of the differences in the DNA methylation profiles between seed groups with the most extreme germination time as an "epigenetic distance" revealed the existence of a positive rank correlation between this index and the ecological plasticity of the variety.

Assessment of factors indicating the level of epigenetic polymorphism in the population of wheat and maize seedlings was carried also. The difference in the seeds' maturity degree by the time of harvesting was shown to be one of them.The existence of another group of factors not depending on the maturity degree and defining a higher level of polymorphism than the maturity degree was revealed. The totality of the obtained data allows considering epigenetic polymorphism as one of the factors of stability of plant communities.

The wide spread observance of this phenomenon indicates its importance for the sustainability of the functioning of biological communities various levels of organization, especially for a crops as single species association. Crops are the basic source of human feeding. At the same time, a crop is association of single species and even varieties, so it is biological system with lowered biological diversity and highest level of competition relations.

Various mechanisms of weakening of inter species competition for resources including different vital strategies are well studied. Thus the natural mechanisms for decline of *intra* species competition actually are not known presently.

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Keywords: epigenetic polymorphism, mechanisms of transgenerational memory, DNA methylation, seeds' asynchronous germination

Evolution of Cell Populations in Vitro: Peculiarities, Driving Forces, Mechanisms and Consequences

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Plant tissue culture methods *in vitro* are widely used for gene pool conservation and accelerated reproduction of rare and endangered genotypes. However, it is known that cultured *in vitro* cells are characterized by increased genetic variability at the chromosomal and gene level.

Multiyear investigations into the dynamics of cell population *in vitro* genetic structure, role and peculiarities of selection effect in the course of adaptation to growing conditions in culture, variability, and genome evolution details in long-term passaged culture (25-30 years and over) let us make generalizations as follows:

•cell culture *in vitro* presents the dynamically-heterogeneous biological system, clone population, which is developing (evolving) as a result of major driving factors of evolution – variation, heredity, selection and drift of genes (genotypes); interaction between these processes determines the biological characteristics of each particular cell line grown in specific conditions;

•cell adaptation to conditions of long-term cultivation *in vitro* is complicated and multistage process, various stages of passaged culture (cell dedifferentiation and their further proliferation, early passages *in vitro*, durable subculturing) demonstrate different types and levels of genome variation, as well as effect of various types of natural selection: destabilizing, directional or, predominantly, stabilizing.

•in the course of cell adaptation to growing conditions *in vitro* three periods can be singled out: the period of isolated cells' primary population, that of strain (cell line) formation and the period of established strain. Subdivision into the periods is determined by the type, direction and intensity of the "natural" selection operating in cell population. The established (adapted to growth *in vitro*) cell lines and strains are genetically heterogeneous, they are characterized by physiological and genetic homeostasis which can be explained by the action of stabilizing selection.

•considerable proportion of genome reorganizations in cultured cells appears to be canalized: variation to occur in culture *in vitro* is frequently comparable to natural variation in plants of related species; changes affect preferentially those DNA sequences which are distinguished by natural interspecies differences within the genus, individual sequences (rearranged in culture *in vitro*) may resemble those inherent to plant genomes of related species in nature; dominance of canalized changes in genetically heterogeneous populations may suggest adaptivity of precisely such genome alterations.

•any somatic cell with living (functionally active) nucleus upon tissue culture initiation as a result of "somaclonal" variation events to occur within the frame of N.I. Vavilov's law of homologous series in hereditary variation can restore in its descendants including regenerated plants overall genetic polymorphism (or at least significant proportion of it) inherent to given species, and, presumably, even plant genus as well. This opens vistas for conservation and restoration of natural polymorphism in cell and tissue culture *in vitro*.

Keywords: plant cell *in vitro*, evolution of cell populations

Factors Affecting on Biocenosis of Arid Territory

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Aim of the study: Biodiversity conservation and sustainable use can lead to the risk of developing and infecting the ecosystems, by adopting adaptive and softening in consideration of their agents. In this area a number of research works in the flora of Azerbaijan are being carried out. For the development of biodiversity, including ecology and application botanic, in the modern world, the organization of long-term global and regional planning and control over natural environment components takes on special place.

The protection of the environment, ecosystems and natural resources recently has been increased at a high level. Taking this into consideration, goal of researches - establish a system of measures to overcome and prevent the negative impacts on the bioseconds of pastures and grassland in arid lands.

Material and methods: The research work covers the arid lands of Azerbaijan (Shirvan, Mill, Mugan, Kura-Araz lowland). There is a generally accepted method of studying the flora and fauna of the arid territory. Biodiversity, floristical, systematically, geobotany, bioecology, locality (by area), economical, matemathical methods, organization of stauniverse, phenological observations, expeditions, and monitorings are used in researches. Ecological conditions of plants, botanical components, life forms, phenological conditions, abundance, phytocenosis (formation, assosiation, microgroups), productivity, species of plant grouping and etc. have been researched on the base of this methods.

Results: Strengthening confrontation of climate change in the restoration of forests, the creation of new forest cover, the improvement of the state of subtropical wetlands, the continuous and sustainable use of aquatic resources, degraded soils, and the influence of other factors negatively affecting on biodiversity plays an important role. As is known, climate and anthropogenic factors are primarily important. in the formation of any biocenosis. Thus, desertification - in the interrelation of the influence of natural and anthropogenic factors have been decreased fertility of arid, semi-arid territories and dry steppes. Under extreme conditions this can lead to irretrievable changes and destruction of the biopotential, degradation and bringing the territory to a typical desert. In this case, the vegetation cover is reduced and begins desertification of territories. This also includes the destructive power of mudflows and floods. All these natural and anthropogenic factors lead to fluctuations at the level of different phenophases and this has a devastating effect on phytocenosis. Desertification of arid territories in the flora of Azerbaijan is estimated as a decrease in the biological productivity of ecosystems.

Key words: arid territory, biocenosis, adaptation, desertification

Farm Animal Biodiversity in Ukraine and its Loss

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Aim of the study: The problem of biodiversity loss is actual for rather long time ago, but it is almost admitted, that wild nature is the most valuable one, and worth saving more. It is truth, of course, but domesticated varieties loss is available as well and even in more rapid rates. So, the problem should be revealed and found ways for its resolving.

Material and Methods: Analytical, axiomatic, hypothesis-deductive, empirical, synthetic, elementary-theoretical, of induction and summarizing methods.

Results: Biodiversity loss is inevitable loss at all levels: species, breed, and especially gene. On outstanding gene pool conservationist I.V.Guziev's survey, only for the last century, in Ukraine disappeared 16 breeds and breeding groups with their valuable genes: four horse breeds (tarpan, nogaiska, striletska, hermano-bessarabian), four breeds of pigs, three cattle breeds, three sheep breeds and two goat breeds with their valuable genes of adaptation to local conditions, stress, heat and disease resistance, special taste of production. V.S.Kozyr's investigation showed, that during 35 years in Grey Ukrainian population there were lost certain alleles (O', E'I', BPQA'D', G2Y2E', BGKY2E'OG'', G2Y2I', B), which logically pulled reduction in meat and milk production, body becomes narrower, tender and tenser.

In general, Grey Ukrainian is a breed, that characterizes with feed unpretentiousness, ease of maintenance, growth during all the life, high broth, skin, meat quality, high percent of fat and protein in milk, good ratio of fat and protein in milk, good maternal qualities. Bulls' live weight on insufficient feed was 1200 kg. This row of breeds' unique traits can be continued, but now this breed is going to disappear. In Ukraine there is only 954 animals of the breed at two farms. At the base of the breed there were created native Simmental, Ukrainian Beef, Lebedyn.

Other unique breed of Ukraine is Brown Carpathian. It is adapted to local mountainous conditions of Transcarpathian region. High altitude doesn't cause aeroembolism for the animals. Genetic research on 7 (Red Polish, Gallovey, Grey Ukrainian, Brown Carpathian, Whiteheaded Ukrainian, Yakutian, Holstein) breeds (MAS-selection) on CSN3, BLG, GH, LEP, PIT-1, MSTN showed, that Brown Carpathian is characterized with the most valuable ratio of genes, associated with yield and protein content. Today this breed enumerates not more, than 100 pure-bred animals and no official herds, only small private holders.

Officially in Ukraine there are some more autochthonous breeds: Red Steppe, Ukrainian Whiteheaded and Lebedyn. But there should be done strict surveys on pure animals availability, as because of need to meet hard market demands, these breeds were diluted with high-productive commercial breeds – Swiss, Holstein, Angler, and so on. So, in Ukraine there can be hardly found some authentic breeds, which Ukraine can boost at international exhibitions, as good-conformed Holstein, beautiful Swiss and other international breeds are in each country and have more possibilities to lead selection and have superior animals. At international exhibitions local authohtonous breeds are of special proud of owners, as only they have such animals with so special colour pattern, or hair distribution or so on. But Ukraine would like to uniform all animals at Holstein template to have nothing special.

Fatty Acid Composition of Seed Oils from Different Inductrial *Cruciferae* Species for Assessment of Biodiesel Production Perspectives

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Aim of the study: Main aim of this research was a comparison of fatty acid composition for seed oils from of spring (*Brassica campestris* f. annua D.C.) and winter *B. campestris* f. biennis D.C.) turnip rape, tyfon (*Brassica campestris f. biennis DC.* × *B. rapa L.*), oil radish (*Raphanus sativus L. var. oleifera*) and camelina (*Camelina sativa*) breeding forms and varieties produced in Natl. Botanical Garden of Natl. Academy of Sciences of Ukraine.

Material and methods: Biochemical analysis of oil content as well as chromatographic analysis of fatty acid composition of mentioned above species and their genotypes were conducted out.

Results: Determination of oil content in seeds of spring and winter (turnip rape forms and varieties identified the highest oil content for winter variety Oriana – 38.1%. Basing on chromatographic analysis indicated two types of fatty acid composition: high-erucic with content of 22:1 fatty acid up to 42.8% and high-oleic with content of 18:1 fatty acid up to 46.92%. On the basis of biochemical analysis of different breeding forms and varieties of tyfon and oil radish maximal oil content in seed was calculated (up to 45.1% for tyfon and up to 42% - for oil radish). The best genotypes with optimal fatty acid composition for biodiesel production were identified, too. Basing on chromatographic analysis of fatty acids of highly oil-containing Camelina (false flax) genotypes (with oil content 42.6-43.9%), most optimal fatty acid composition for biodiesel production was identified in Peremoha variety and breeding forms FEORZhYaF-2 and FEORZhYaFD.

Conclusions: Respectively, the conclusion can be made, that accepting yield levels for biodiesel production the attention must be concentrated on such breeding forms and varieties as winter variety Oriana and spring form EOSYaF-1 (turnip rape), Peremoha, FEORZhYaF-2 and FEORZhYaFD (Camelina), Fitopal and EOTFV (tyfon) and EORZHOFL-5 (oil radish). But accounting high level of linolenic acid (up to 38.3%) and other mono- and polyunsaturated fatty acids (up to 87.9%) false flax represents most appropriated species for industrial biodiesel production. Additionally, chosen genotypes could be used for production of two different types of this biofuel – “light” and “heavy”, according to differences in their fatty acid composition.

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Keywords: *Cruciferae*, turnip rape, tyfon, oil radish, camelina, genotypes, oil, fatty acids, composition, biodiesel.

Fatty Acid Composition of the Body Tissues of Honey Bee under the Action of Pesticides as a Marker of Toxicity

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Aim of the study: Stable obtaining of competitive agricultural products is associated with the use of plant protection products. However, chemicalization of agriculture poses a serious potential hazard to the environment. The dynamics of the fatty acid content in the body of honey bee is an important indicator of its functional state. In turn, this index can characterize the changed agroecological conditions, since bees are bioindicators of the environment state. The aim of this research is to study the fatty acid composition of the body tissues of the honey bee *A. mellifera L.* after feeding with the fungicide preparation.

Material and Methods: In an acute study the bees received an oral fungicidal preparation (active ingredient: tebuconazole, triazole class**).** According to toxicological studies, it is classified as weakly toxic, 3rd hazard class. The determination of the residual amount of pesticides by QuEChERS-method (2008) showed the accumulation of tebuconazole in the body of bees. Lipids were extracted from the tissues of the total chest and abdominal segments of the bees. The analysis of fatty acid was carried out on a gas chromatograph Trace GC Ultra (USA) with a flame-ionization detector and a standard mixture "37 Component FAME Mix" ("Supelco") was used for their identification. Seventeen fatty acids were detected and quantitatively identified in the tissues of bees in the control and experimental groups.

Results: The oral administration of fungicidal preparation in the amount of 100 and 200 μg of tebuconazole per individual bee leads to a redistribution of fatty acid content in the body. Reduction in the content of saturated fatty acids, especially palmitic and stearic, may indicate a decrease in the energetic and structural supply of the bee organism under pesticide loading conditions. The revealed increase in the content of long-chain polyenoic fatty acids can be important because they are involved in the regulation of a wide range of physiological processes. In particular, this refers to arachidonic and docosahexaenoic acids, the content of which is significantly increased. It is assumed that the increase of the fatty acid content of the families ω-3 and ω-6, as well as the ratio ω-3 / ω-6 characterizes the type of eicosanoids that are synthesized in the body at pesticide loading. The revealed modification of the fatty acid spectrum of lipids of honey bee tissue depending on the accumulated tebuconazole are explained by the participation of the fatty acids in the reorganization of reactivity system of the bee organism in the response to pesticide loading.

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Keywords: honey bees, pesticides, fatty acids.

Features of changes of the activity of antioxidant system enzymes in red blood cells in female rats after single and fractionated head irradiation in different doses

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Aim of the study: Radiotherapy of brain tumors in women of reproductive age may be accompanied by prolonged disorders of the endocrine function and lead to the development of stable ovarian dysfunction. Catalase and superoxide dismutase (SOD) are one of the main enzymes that are part of the system of intracellular protection of the body from free radicals of oxygen and products of peroxide oxidation of lipids (LPO) - antioxidant system (AOS). The aim of this study was the determination of the activity of catalase and SOD in erythrocytes of peripheral blood of female rats in the dynamics (after 7, 14, 30, 90 days) after single dose irradiation of the head in a dose of 2.0 and 6.0 Gy and fractionated in a total dose of 6.0; 10.0 and 20.0 Gy.

Material and methods: Experimental studies were performed on 240 sexually mature laboratory female rats weighing 150-170 g. The distribution of animals in groups was carried out in accordance with the experimental conditions (6 groups, 10 animals per study period). Animals were irradiated on an X-ray machine "RUM-17", the power of an exposure dose of $2.09 \cdot 10^{-4}$ Kl / kg and removed from the experiment by decaying with guillotine. The activity of catalase was determined in erythrocytes by the Aebi method in the modification of L. M. Ovsiannikova; activity of SOD - in accordance with the recommendations of the Bukovina State Medical Academy.

Results: Investigation of activity of catalase after single head irradiation in a dose of 2.0 Gy showed a statistically significant decrease in the index relative to the control values during the first 7-14 days, and after repeated exposure in a dose of 6.0 Gg, there is a significant decrease in the index over the entire duration of the observation. There is no difference between the activity of catalase in the case of comparison between the results of fractionated irradiation at doses of 6,0 Gy and 10,0 Gy, as well as 10,0 Gy and 20,0 Gy. At the same time, there is a significant decrease in the activity of catalase compared with control in all observation periods for fractionated irradiation at doses of 10.0 Gy and 20.0 Gy. These results reflect the sustained inhibition of catalase activity with an increase in the total dose of irradiation.

Investigating the activity of SOD in erythrocytes of rats after single head irradiation in a dose of 2.0 Gy showed a statistically significant decrease in the indicator for control after 7 days after irradiation and complete recovery - after 90 days. Single-dose head irradiation of animals at a dose of 6.0 Gy resulted in a significant decrease in the activity of SOD of erythrocytes after 7 and 14 days after irradiation. Fractionated irradiation of the head causes a decrease in SOD activity, which occurs both in the early and late observation periods, and is characterized by direct dose dependence. Recovery of SOD activity is slower than catalase, and even in late observation periods - at the 90th day after the applied regimen of radiation, complete recovery is no observed.

Taking into account the results obtained, it can be concluded that the biological efficacy of single head irradiation of females of rats in a dose of 2.0 Gy is equal to the effect of fractionated irradiation in a total dose of 6.0 Gy and single irradiation in the dose of 6.0 Gy - the effect of fractionated head irradiation in the total dose 10.0 Gy.

Keywords: irradiation of the head, female rats, catalase, superoxide dismutase.

Features of Reproductive Indicators of the Pumpkinseed *Lepomis gibbosus* (Linneus, 1758) from Zaporozhzhya Reservoir (Ukraine)

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Aim of the study: The study of the reproduction of the pumpkinseed has an important theoretical and practical significance for solving problems concerning the spread of this species and its adaptation to new habitat conditions. An important aspect of the study of pumpkinseed reproductive indicators is the study of the histological features of the sexual products development and the development phases of gonads of this species under the conditions of the Zaporizhzhya Reservoir.

Material and methods: Ichthyological material was collected in the water area of the Zaporizhzhya Reservoir in late May – early July. During the sampling for fertility, each female was measured and weighed, and scales were also collected for further age determination. The index of individual absolute fertility was calculated for each individual. Individual absolute fertility (IAF) is the number of mature eggs in the ovaries of one fish. Microtome "MZP-01 Technom" was used for making sections. The preparations were stained with hematoxylin-eosin and after Mallory. Microphotographs of histological preparations were made using a digital camera "Sciencelab T500 5.17M".

Results: The absolute fertility of female pumpkinseed ranged from 3.2 to 29.2 thousand eggs, relative fertility ranged within 158-588 eggs. The average index of the individual absolute fertility of females was 7366.3 eggs. The highest fertility rate was observed in four years old individuals, the IAF index on average was 8549.7 eggs. Beginning with the fifth year of life the fertility of the pumpkinseed gradually decreases, which can be due to the aging of the fish organism. The index of IAF of five years old individuals reached about 7676.6 eggs, and index of six-year-olds was 600 eggs less and averaged 7018 eggs.

In the phase of vacuolization (phase D), the vacuoles of the egg are small, evenly distributed inside, their diameter is 13.2 ± 0.9 μm, from a minimum value of 4.4 μm to a maximum of 54.5 μm. The number of vacuoles increases by the end of the phase. The diameter of the oocyte was 234.7 ± 8.2 μm. The nucleus is clear; it had a diameter of 52.5 ± 1.3 μm. The thickness of the oocyte shell was 4.5 ± 0.3 μm. The cell sizes varied greatly, from 8.2 μm^2 to 86.2 μm^2. This may indicate an asynchronous development of the gonads, which manifests in the formation of different-sized oocytes in one phase.

In phase E, the process of vitellogenesis, especially yolk, was intensified; it was stored in the form of granules. Vacuoles in this phase reached the maximum size and stopped increasing. Their average diameter was 27.7 ± 1.1 μm, and the area of oocytes was 205.56 ± 10.6 μm2. The thickness of the shell in phase E slightly increased and amounted to 5.2 ± 0.5 μm. The number of vacuoles in the development process decreased due to their fusion, which began at the end of the phase. This was due to the accumulation of the yolk granules in the cytoplasm of the oocyte, which displaced the vacuoles, and then they merged to form homogeneous layers.

In the E-F phase, a mass fusion of vacuole was observed, with individual vacuoles that did not merge having a diameter of 25.42 ± 1.1 μm, their diameters ranged from a minimum value of 7.1 μm to a maximum of 63.7 μm. It is worth noting that the increase in vacuole, as compared to phase E, was not observed, and a slight difference in parameters is explained by the merge of large vacuoles. The size of the oocytes of the E-F phase was 209.8 ± 96.5 thousand μm^2, with a diameter of 511.1 ± 80.7 μm. The thickness of the shell has also increased, in comparison with the previous phases, and it was 7.4 ± 0.5 μm.

As a result of the studies on the oogenesis of the pumpkinseed, we have identified various phases of oocyte development on each histological preparation, which indicates the asynchronous development of the oocytes. The portion spawning of the pumpkinseed explains this. It was also revealed that at the E-F stage vacuoles of the oocyte merge, forming peculiar layers of the homogeneous cytoplasm, which is caused by intense vitilogenesis. Thus, plasticity of the reproductive system of the pumpkinseed allows it mastering new reservoirs and increase its number effectively.

Keywords: pumpkinseed, Zaporizhzhya Reservoir, gonads, vitilogenesis.

Features of the Association of Anaerobic Microorganisms that Have Acquired Resistance to Antibiotics

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Aim of the study: Among the existing biological methods for purifying pharmaceutical sewage, the most effective is an anaerobic method. For more effective removal of antibiotics known technologies using sorbents: a biofilm with anaerobic association of microorganisms is formed on the surface of the sorbents. Microorganisms of biofilms are capable of adaptation to antibiotics, and clean waste water of the pharmaceutical industry. In this regard, it is necessary to investigate the anaerobic association of microorganisms, which will enable to explain the mechanism of rapid adaptation and stability of microorganisms to antibiotics. This will be the first step to develop the technology for biological wastewater treatment pharmaceutical industry.

Material and Methods: Municipal waste water was used as a model environment (Bortnychi aeration station, Kiev). Norfloxacin was used as a model antibiotic (LLC "Experimental Plant" GNTSLS ", Ukraine). Moisture, ash content and content of the dry organic substance were determined three times according to standard procedures. The fermentation was carried in anaerobic reactors of volume of 1 dm3 with coefficient of filling of 0.7. Temperature of fermentation was 38±2 °C (mesophyll mode) with stirring. The content of dry organic substance in the methanetank is 2%. Fermented residue of the laboratory methanetanks of the Department of Ecobiotechnology and Bioenergetics at the National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute" (Ukraine). As a carrier for biofilm was used the sorbent based on calcium and magnesium compounds. To detect the microorganisms of the biofilm was used the medium with norfloxacin and PCR reactions. For detection of biofilm on the surface of the sorbent was used energodispersive spectrometer Oxford X-Max 50.

Results: The subject of the study was the anaerobic association of microorganisms, which purifies which purifies sewage with high concentration of antibiotic. Selection was carried out on norfloxacin, resulting in an association of microorganisms that is resistant to this antibiotic. The resulting biogas was collected in wet-type gasholders. Biogas supported combustion, which confirms the presence of methane in biogas.
From the suspension of microorganisms, DNA was isolated and PCR was performed on marker systems, which are indicated in the table:

Targeted gene	Name and sequence of the oligonucleotide primer		Expected names of microorganisms
Archaeal 16SrRNA	*A109f* *A934b*	5'- ACKGCTCAGTAACACGT-3' 5'-GTGCTCCCCCGCCAATTCCT-3'	*Domain Archaea*
Archae 16SrRNA (rrn)	*Arch f 364* *Arch r 1386*	5'-CCTACGGGRBGCAGCAGG-3' 5'-GCGGTGTGTGCAAGGAGC-3'	*Methanobrevibacter, Methanobacterium, Methanosarcina*
mtbA	*LMTBA* *RMTBA*	5′-TTCTCCCTTGCMCAGCA-3' 5′-ACWGGRTCVAGRTTWCC-3'	*Methanosarcinales*

For all marker systems, the expected amplification products were obtained.

The sorbent granules were placed in a suspension of microorganisms that are resistant to norfloxacin. On the surface of the sorbent there was the formation of a biofilm association of anaerobic microorganisms. Sorbent containing an active surface of microorganisms is capable of better water purification from contaminants and can be used in technology for pharmaceutical wastewater in the future.

Acknowledgements: We thank our colleagues from Institute of Cell Biology and Genetic Engineering who provided insight and expertise that greatly assisted the research.
Keywords: biogas biofilm, antibiotics, wastewater treatment.

Flavonoids, as One of the Biochemical Markers of Plant Resistance *Vitex*, *Lavandula* and *Stevia* in the Conditions of Introduction of M.M. Gryshko NBG of NAS of Ukraine

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Aim of the study: At this stage of the present important question of humanity arises the problem of preserving for future generations the unique flora, as traditional for a particular region and introduced. Sometimes, however, the mission becomes impossible due to climate changes and climatic conditions on the Earth, which exercises significant influence on the plant world and constantly makes adjustments in the process of preserving.

Therefore, the **aim** of our study was to determine and compare the quantitative content of flavonoids in aerial parts of industrially valuable for Ukraine of introducents*Vitex*, *Lavandula* and Stevia, which are grown in the open ground, greenhouse and in vitro conditions. Identify plants with a high content of these compounds to assess their ability to handle stress and as a source of biologically active compounds in the processing of vegetable raw materials.

Materials and methods: the material for investigation was the selected objects from the collection of aromatic plants of the Department of cultural flora of M.M. Gryshko NBG of NAS of Ukraine: representatives of the genus *Vitex, Stevia rebaudiana* and *Lavandulaangustifolia*. For laboratory studies according to the methodology took the leaves of plants grown under different conditions, namely, under greenhouse conditions, on a plot of open ground and in the laboratory of in vitro culture. The content of flavonoids in terms of rutin was determined by the method (ANDREEVA&KALINKINA,2000.), modified V.F Levon(LEVCHYK*etal.,* 2014).

Results: As a result of laboratory experiments has found that plants *Vitex* in general characterized by a high level of flavonoids. For example, open-ground plants, it was maximum 1,894±0,023 mg/g in *V. agnus-castus*, the average 1,823±0,009 mg/g in *V. cannadifolia*and the slightest 1,066±0,009 mg/g in *V. pseudonegundo*. *In vitro* accumulate a lesser amount of flavonoids, however the similar pattern, namely the most of the flavonoids 1,205±0.02 mg/g accumulating plant species *V. agnus-castus*, somewhat less 1,094±0.03 mg/g. *V. cannabifolia* least 0,404±0.01 mg/g – *V. pseudo-negundo.*

Regarding these indicators, the high content of flavonoids 1,528±0,021 mg/g recorded in greenhouse plants *S. rebaudiana*. We can explain a direct correlation between the level of moisture of plants and the amount of their accumulation of flavonoids. The highest content of flavonoids in plants *S. rebaudiana* closed ground, in our view, is formed under the influence of two factors: insufficient level of artificial light in the greenhouse, which causes stress in the plants, and a sufficient level of moisture.

The level of flavonoids in the examined plant under in vitro conditions in comparison with plants grown in greenhouse or in open field is the lowest. This pattern is probably associated with the stable optimal conditions for the growth of plants in culture vessels, which minimize their stress.

Each method of cultivation of crops implies the different nature and level streakiness on their organism. The most stressful are the conditions of open ground, as the plants have to adapt to the special composition of the soil are more severe conditions to change the temperature of moisture, solar insolation, and struggling with a number of biotic factors. Phenolic compounds give them the ability to adapt to changing environmental conditions, therefore, the accumulation of flavonoids during the growing season depends on the growing conditions of plants.

Greenhouse conditions can temporarily cause discomfort and provoke a temporary stress in plants. This in contrast to in vivo conditions,plants in vitro are in constant temperature and lighting regime, grow on optimally-chosen nutrient medium, therefore, the formation of flavonoids for them is not rotten process.

The result of the research, the total content of flavonoids in the leaves of investigated plant species of the genus *Vitex, Stevia rebaudiana, Lavandulaangustifolia*, depending on the cultivation conditions set a common pattern: in plants of the same species in the open ground of flavonoids accumulate much more, so that they are more stress-resistant than in vitro.

Kaywords: flavonoids, stress, soil conditions, greenhouse, *in vitro*.

Flora Biodiversity of Chenlibel Massive

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Aim of the study:Intensive use of Chenlibel Massive as an farming area caused the formation of line erosion, gullies. As a result of continually solid anthropogenic reactions, gully- ravine complex have formed in highly fertile Chenlibel massive. No scientific researches carried on in this field. Chenlibel massive has been chosen like a biological polygon to stop the gully formation process and endue with resoration of fertile lands and its biodiversity has been researched.

Materials and methods: 25 geobotanical descriptions of the area of 1850 m^2 were carried on to research the gullies as a result of wasteland expeditions. Richness of species (Braun-Blanquet, 1964), names of the species (флора Азербайджана 1950-1961), (конспект флоры Кавказа 2003, 2006, 2008, 2012, Əsgərov 2016, Qurbanov 2009) are given according to these resources. Special programs are used to work with descriptions (TURBOVEG, TWINSPAN, MEGATAB) Researches have been carried on with route and stationary methods in Shemkir region, Chenlibel massive in 2016-2017. " Red Data Book" IUCN (IUCN, 2001; Azer. QK 2013) has been used to determine the status of rare and extinct species. About 50 fitocenological descriptions were carried on, 150 herbarium patterns were gathered. Descriptions were carried on in appropriate pattern grounds according to landscape and vegetation. (Novruzov, 2010)

Results: 55 species of plants that belong to 14 familias and 26 breeds in gully flora were detected according to detection of herbarium patterns that we have gathered from the gullies in Chenlibel massive and literature resources. Plants with covering seeds covers 85.4% of Chenlibel flora and it is divide into two groups itself; 18% of monocotyledonous and 67 % of dicotyledonous. In floristic spectrum of Chenlibel, 5 familias according to their species richness, Fabaceae Lindl.- legumes 8, Poaceae Barnhart-grains 7, Asteraceae Dumort –multiplex flowerets 8, Rosacaea Juss. –flower flowerets 8, Caryophyllaceae Juss.- carnation flowerets 7, have privileges. The rest of the 9 familia that forms 25% of Chenlibel flora is typified only with 1-2 species. Forests rank main place in the flora of Chenlibel gullies. Forest-grass vegetation Plantago, Centaurea, Mentha, Narcissus, Tussilago, Rumex, Astragalus, mountain-xerophyte vegetation Rosa, Crataegus, Rubus, Paliurus and etc. are encountered. Forests have been cut down by local people in different years as a means of wood, and now restoration is going on in various stages. High humidity and sun radiation is advantage for growing of tall grass cover in upper border of Chenlibel forest. Weed and half weed have been formed as a result of grazing and cutting. All heath ecosystem is widespread in gullies of Chenlibel massive (picture 1) Geographical state of the massive, population minority enables to keep the heath in natural state. Faint anthropogenic changes are observed in research area. Grass like perennials form the main vegetation cover. Grass vegetation like Filipendula ulmaria (L.) Maxim, carex capillaris L, Mentha piperita L, Galium achurense Gressh, Hypericum eloongatum Ledeb, Glechoma hederacea L, Ranunculus repens L, Stachys annua L, Lathyrus pratensis L. dominate in this area.

Key words: flora, familia, species, genus, plants, generation, associations, geobotanical

Flora Biodiversity of Shemkirchay Basin

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Aim of the study: In Shemkirchay valley desert, half desert, heath, mountain - xerophyte, wood, meadow (alp and sub alp) vegetation types cover foothill, medium and high zone in 2500 m altitude from sea level. 1600-2500 m altitude of the valley consists of sub alp and alp meadows. Vegetation cover and flora of sub alp and alp meadows is too rich and colorful. Zones mentioned above are significant for economics. But mountainous parts exposed to anthropogenic forces. The valley has been mere researched from botanical point of view. Taking into consideration the unique, scientific and practical significance of the area, forest, meadow, heath, desert and half desert vegetation has been researched. If to pay special attention to increasing anthropogenic factors of mountainous and high mountainous ecosystems, the vegetation cover of geobotanical point of view is especially actual problem.

Materials and methods: Route and stationary methods were used in researching flora biodiversity of Shemkirchay basin. Fitecenological describtions were carried on within the borders of natural arrangement of vegetation cover. Richness of species (Braun-Blanquet, 1964), names of the species (Azərbaycan florası 1950-1961), (Qafqaz florasinin konspekti 2003, 2006, 2008, 2012, Əsgərov 2016, Qurbanov 2009) are given according to these resources. Special programs are used to work with descriptions (TURBOVEG, TWINSPAN, MEGATAB) " Red Data Book" IUCN (IUCN, 2001; Azer. QK 2013) has been used to determine the status of rare and extinct species. About 50 fitocenological descriptions were carried on, 150 herbarium patterns were gathered. Descriptions were carried on in appropriate pattern grounds according to landscape and vegetation. (Novruzov, 2010). In usage and definition of the materials, common methods accepted in botanic, ecological- geographical, morphological, areological, geographical- systematic, statistic- floristic methods have been used. Cameral researches have been carried on in Botanic department of Ganja State University.

Results: critical agitation of Shemkirchay basin's flora biodiversity was studied according to invertarisation of species, defined taxonomic structure and bioecological peculiarities. Spreading of 75 familias, 668 sorts belonging to 240 breeds have been detected. Systematic biomorphological, ecological and geographical analysis of the flora was presented and endemism was defined. Legume, grains, multiplex flowerets, flower flowerets occupy main place according to richness of species. Monitoring have been carried on studying and evaluating of biodiversity of endemic, rare and extinct species of the valley. 20 familias 36 species belonging to 26 breeds become rare and extinct. Contemporary fitocenological classification of Shemkirchay basin vegetation was carried on association level and 36 structures, 57 associations detected. Spreading of validity of wood, meadow, mountain xerophyte, water-heather, water-shore, desert, half desert and gully vegetation was revealed and succession process and direction was revealed. We can come across –DD- oreopteris limbosperma (All.) Holub- belonging to" Lack of information" category;-NT- Corallorrhiza trifida Chatel belonging to "Up to dangerous stage"; -EN- Orchis purpurea Huds belonging to " Under extinction danger" in Shemkirchay valley. Those species have been added to the second volume of Red Data Book of Azerbaijan Republic (2013). Organization of control over rare species population is considered advisable.

Key words: flora, familia, species, genus, plants, generation, associations, geobotanical

Flora of Shahdag National Park (Azerbaijan Republic)

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Aim of the study: Floristic research is very important in terms of studying region's flora. Shahdag National Park territory flora was fully studied and systematically analyzed as a result of research carried out in this direction and determination of plant specimens obtained during expeditions. Schematic description of herbaceous plants containing 1603 species of plants in Shahdag National Park territory has been developed during the research period. 31 types of spores and 1572 types of seedy plants (12 species of gymnosperms, 1560 species of angiosperms, including 294 monocotyledonous, 1266 dicotyledonous) have been identified in the area flora.

Material and methods: Researches to explore Shahdag National Park territory in 2013-2017 years fulfilled during expeditions and in stationary conditions. During the numerous expeditions to the region, herbarium samples were collected. Field work on studies was done in territory three times a year. Taxonomic spectrum of territory was drawn up. "Azerbaijan Flora", "Determination of Caucasus plants" were used in determination of collected herbicides. Taxon's name were developed according to works S.K.Cherepanova and "Abstract Caucasus flora".

Results: 1603 species of Shahdag National Park territory flora divided into spores and seedies in 9 class (*Lycopodiopsida, Equisetopsida, Bryopsida, Ophioglossopsida, Polypodiopsida, Pinopsida, Chlamydosperamtopsida, Liliopsida* və *Magnoliopsida*). Mosses with 1 genus, 2 kinds, 2 species, Equisetum hyemale with 1 genus, 1 kind və 4species, Plauny with 1 genus, kind və 1 specy, Polypodium with 11 genus, 17 kinds and 24 species containing 1,9% of flora.

Asteraceae genus 66 kinds, 184 species, *Poaceae* 50 kinds, 131 species, *Brassicaceae* 35 kinds, 71 species, *Apiaceae* 35 kinds, 58 species, *Lamiaceae* 28 kinds, 82 species, *Fabaceae* 26 kinds, 136 species, *Rosaceae* 25 kinds, 101 species, *Caryophyllaceae* 21 kinds, 66 species, *Boraginaceae* 18 kinds, 40 species, *Orchidaceae* 16 kinds, 29 species, *Ranunculaceae* 14 kinds, 45 species, *Scrophulariaceae* 12 kinds, 58 species, *Polygonaceae* 8 kinds, 26 species, *Cyperaceae* 8 kinds, 53 species takes main place in Shahdag National Park flora plants. Remaining 106 genus with 1-7 kinds contain 35% of region flora.

Number of species in different kinds have not spred equally in flora of the area. Thus, Astragalus, Campanula and Carex species with more than 20 species contain 6.23% of area flora with 100 species, 20 kinds with species changing between 10-19 contain 18,22% of area flora.

Keywords: Shahdag, genus, kind, species, flora concept

Heterotrophic Bacteria of the Soil Ferrosphere

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Aim of the study: The participation of heterotrophic bacteria in the processes of microbial corrosion and the issue of their diversity in the soil ferrosphere (a zone of soil directly adjacent to the surface of the metal) remain insufficiently studied. In addition, the isolation and identification of strains of heterotrophic bacteria become important because of the need for the use of pure test cultures in the study of microbial corrosion processes. Therefore, the aim of this study was to isolate and identify heterotrophic corrosive active bacteria in the soil ferrosphere.

Material and methods: The isolation of pure cultures of bacteria was carried out from the ferrosphere of the underground metal structure by the Koch method. Meat peptone agar and FWA-Fe (III) citrate medium were used to isolate and cultivation. Cultivation temperature was 29°C. The study of culture, morphological, physiological and biochemical properties of bacteria was carried out by well-known methods. Methods described by Safronova et al. were used for sequencing the 16S rRNA gene. Phylogenetic analysis was performed using the MEGA 6.0 program.

Results: We isolated and identified heterotrophic bacteria with ammonifying activity - *Bacillus simplex, Streptomyces gardneri, Streptomyces canus*; with ammonifying and iron-reducing activity - *Fictibacillus sp*. Isolated strains are registered in the GenBank database. The strains are potentially corrosive and can be used as test cultures in the study of microbial induced corrosion processes.

Keywords: soil, ferrosphere, heterotrophic bacteria

Impact of Amaranth-Corn Silage on Metabolism and Dairy Productivity of Cows

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Aim of the study: to study of the impact of amaranth-corn silage on the dynamics of protein substances in the organism of milk cows and on their productivity.

Material and methods: Experiments on silage of amaranth together with corn (in the ratio 1: 3) were carried out. The nutritional value and quality of silage, the content of essential amino acids in it have been studied. Also the influence of the fed silage on the dynamics of protein substances in the organism of milk cows has been studied.

The experimental part of the experiments was carried out on 20 milk cow of black and motley breed with a body weight of 580-620 kg with a planned productivity of 5000 kg of milk in the conditions of farms.

In the first period (for a period of 30 days), all animals received a normal diet, including legume-cereal hay and concentrates, balanced for all basic nutrients and exchange energy. In the second period the animals were divided into 4 groups. Amaranth-corn silage was included in their diet by substitution of exchange energy in the amount: 10 kg in the first test group, 15 kg in the second test group and 20 kg in the third test group. The control group of cows continued to feed on the diet of the first period. The duration of the second feeding period was also 30 days.

Results: Silage of amaranth with corn in a ratio of 1: 3 leads to a high-quality silage with a good odor and a pH of 4.2. Amaranth protein has a high nutritional value, which is due to the optimal ratio of all amino acids, including irreplaceable and critical. This trend is also maintained in the silage of the amaranth obtained with mixing maize in a ratio of 1: 3.

The green mass of amaranth exceeds the green mass of corn in the content of carotene by 10 mg, calcium by 3.9 g. and phosphorus by 1.1 g. Accordingly, amount of these substances in the amaranth-corn silage is more than in corn silage: carotene by 8 mg, calcium - on 2 g, phosphorus - by 0.4 g.

Feeding dairy cows of silage from amaranth and maize (1: 3) in the amount of 10-20 kg per day leads to an increase in the amount of total proteins in the blood serum by 3.7-10.9%. That provides the simultaneous increase in the indices of the main protein fractions. Feeding milk cows mixed silage from amaranth and corn does not violate the spectrum of the amino acid composition of blood serum. On the contrary, it enriches them with essential amino acids, in particular, lysine. Inclusion of a mixed silage from amaranth and maize (1: 3) in the amount of 10-20 kg into the diet of dairy cows leads to an increase in the milk yield within 7.5-10.2%.

Thus, our conducted researches show the amaranth's value as a source of high-quality protein. That makes it possible to use it both as a green mass and in a silage form for feeding dairy cows.

Keywords: amaranth, silage, proteins, milk productivity.

Impact of Background Radiation on Height and Growth of Bushes and Trees on Absheron

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Aim of the study: Background radiation has an important place among the environmental factors caused by technogenic pollution of land areas and affecting vegetation on the Absheron peninsula. Environmental biodiversity, including the herbaceous vegetation, is effected by the ionized radiation from the universe, and by artificially created radiopharmaceutical particles as well. The effect of abiotic stressors leads to a significant reduction in the productivity of plants and the diversity of natural plant species. From this point of view, radioactive radiation can also affect that in mentioned way. Live systems, including radiation which is the high stress factor for plants, can alter the morphological, physiological and biochemical parameters of plant cells. The environmental factors of the areal in which plants are spread are also important in this process.

Materials and methods: At all stages of their development plants are exposed to water regime degradation, negative and positive temperatures, ultraviolet radiation of the sun etc. Live systems and radiation as a powerful stress factor for plants transform the many morphological, physiological, and biochemical parameters of plant cells by its effect. The study of adaptive mechanisms of abiotic factors has important scientific and practical significance. When the dose and duration are low, radionuclides do not have a significant effect on the growth pace of the plants, however their high dose can cause mutations in cell components, which can seriously affect the cells of the tissues and organs of the leaf, stem and root system.

Radioactive irradiation affects the biological active compounds in the cells of the tissue and organs of the complex compound and causes relative increase in the initial stages of the individual development period. However, when the irradiation begins to affect the meristem cells, plant tissue is damaged and eventually causes the destruction of the plant organism. As a research object, some species (Photinia serrulata Lindl, Nandina, Pittosporum heterophyllum Franch, Bugs microphulla Sieb.et Zucc., Magnolia grandiflora L. etc.) and other species introduced to the Mardakan Dendrology Institute have been studied. The effect of radiation on the photosynthesis apparatus was learned in base of Godnev T.N. methodology by separation of chlorophyll fractions. Observations revealed that separated fragments of chlorophyll are not too many, which confirms that the background radiation of the Absheron Peninsula does not have a devastating effect on chloroplasts. .

Results: Research has shown that development of newly introduced trees and shrubs has been normal under the influence of background radiation on Absheron, and growing plants have been found to be exposed to saline. The same development dynamics have also been normalized in new introductory species in other areas and no negative marks were noted in the indicators, compared to plant species in the control area. Sanitary norm index for Absheron peninsula is 0.06 mkZv / hr or 6 mkR / hr. The backgorund indicator of experiment areas of the study were determined to be 0.08-0.24 mkZv / hr. The background radiation of the inspection area (Dendrology Institute territory) was close to the norms and reached 0.12-0.18 mkZv / hr. The limit for the development of plants was assumed to be 0.5 mkZv / hr or 50 mkR / hr.This is much higher than we have marked. The optimal dose for normal plant growth and development was determined to be 0.2 mkZv / hr or 20 mRR / hr. The indicators we got are also at this level. The high background radiation did not have a negative impact on the size and development of plants. Both plantation and plant vegetation have been normal. Because of the background radiation of the Caspian and Pirallahi regions are close to sanitary norms, there is no serious morphological variability in plants. Studies have shown that there is no significant variability in plants under the conditions of the observed background radiation, and the positive effects of plant growth and development.

Acknowledgements: Thanks to the management, the work was carried out not only in the territory of institute of "Dendrology" but also in settlements Gala, Bina.

Key words: background radiation, trees and bushes, durability

Improvement of Measures Against *Homoptera, Coccoidea* in the Absheron Dendroflora

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Aim of the research: Absheron dendroflora is known to consist of introducents involving perennial decorative and forestry plantscultivated in parks, gardens, in the yard areas of individual and public enterprises, as well as ingreening farms.These introducents are exposed to harmful influences of pests having oral sucking apparatus. Taking actions against the pests and other harmful organisms is technically complicatedand has ecological responsibility in the Absheron dendroflora, because of the proximity of settlements.

Materials and methods: Currently, chemicals are widely used against pests in the Absheron dendroflra. This method has flaws as the density of the pest spread, the degree of caused damage and other important factors are not considered. The use of chemicals leads to decrease in number of useful insects, their effective activity weakens and eventually, chemicals can not prevent the pest propagation, which resulted in the disturbance of the ecological balance. The main purpose of the research is solving all these problems. Biological means, including local entomofauna, were used for ecologically safe struggle against main species of pests.Considering biological properties of pests, phenological observations and field experiments were performed to determine the usageregulation of chemical preparations. Number and effectiveness of natural enemies of dangerous pests - predatory bugs - Rhyzobios lophanthae, Chilocorus bipustulatus andKriptolemus were assessed.The effectiveness of various chemicals against the younger larvae was studied (N.N.Kuznetsov, B.K. Tkaçuk,M. A.Lazarev , Yalta, 1981).

As a result of the research, 22 *Homoptera Coccoidea* species belonging to 18 genus and 4 families were established in the Absheron dendroflora.*Chloropulvinaria floccifera* West, *Pseudococcus comstocki* Kuw, *Ceroplastes yaponicus* Green, *Aulocaspis rosae* Bouche, *Aspidiotus nerii* Bouche., *Unaspis eunymi* Comst. are dangerous species.

Results: As natural enemies of the pest - predatory bugs - *Rhyzobios lophanthae*, *Chilocorus bipustulatus* and *Kriptolemus* do not widely spread in the Absheron dendroflora, they can not prevent the propagation of*Homoptera Coccoidea*.

Therefore, chemicals were applied in the periods of the formation of the pest larvae as well as during the less sensitive period of the growth of natural entomofags. The pest and its natural entomofags were assessed and chemicals were not used in the fields where the number of entomofags prevailed. Chemicals were applied to the field in the shape of strips.

As a result of the taken measures entomofag complex of the field was preserved, the number of the pests reduced and kept at the safe level for the trees and eventually, favorable conditions were created for the restoration of ecological balance. The following chemical preparations were 90-92% efficient in 0.1-0.2% filthiness: poligor (40% e.c.), kingor (40% e.c.), valsarel (53% e.c.), desis (25% e.c.).Thus, the use of selective preparations, considering the effective acts of the entomofags, their ratio with pests, biological properties, improves the struggle against the pest and allows solving the problem. It is also advisable to conduct research on developing technologies for the propagation of useful entomofags (predatory bugs) in biological laboratories and their mass propagation for the use against the pest.

Keywords*: Homoptera Coccoidea*, biological struggle, chemical struggle, useful insect, *Coccinellidae,* parasite

In Vitro Cultivation of *Populus* and *Salix* spp.

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Aim of the study: *Populus* and *Salix* spp. are not only fast-growing energy crops, but also well-studied model objects in cell and genetic engineering of tree plants. *In vitro* microclonal propagation of woody plants is an important biotechnological approach for their propagation. It allows to produce the clonal material of high quality and consequently to increase the productivity of plantations. The aim of current work was introducing into *in vitro* culture and establishing the collection of fast growing trees, poplars and willows.

Material and methods: The buds from fast growing trees of three willow ('Zhytomyrska-1', 'Olimpiysky vohon', 'Pechalna') and six poplar clones ('Novoberlinska-3', 'Novoberlinska-7', 'Lubenska', 'Volosystoplidna', 'Roganska', 'Kytaiska×Piramidalna') were washed with different solutions – concentrated soap solution, sodium hypochlorite and 70% ethanol during different exposure time and then planted on nutrient MS and WPM media supplemented with different combinations of phytohormones (BAP, NAA, IMK).

Results: Highly efficient sterilization (78%) was achieved with the using three-step treatment of soap solution, sodium hypochlorite and 70% ethanol with exposure time of 2, 10 and 1 min respectively. Washing of the plant material with warm soap water is important step of sterilization process, what allows to pre-clean material from fungi and reduce the time of sterilization by aggressive sterilizing agents. Excluding of the washing stage by soap solution led to a strong affection of material by spores of fungi, while increasing of exposition time by NaClO up to 10 min, and by C_2H_5OH up to 5 min led to a total loss of explants. When plants were cultivated on WPM media supplemented with 0.3 mg/l BAP and 0.1 mg/l IBA, high rate of rhizogenesis and induction of meristems were determined. Average rooting rate obtained in the research was 93%. *In vitro* established plants will be later used for genetic engineering studies.

Acknowledgements: The work was carried out with the support of program for scientific research of National Academy of Science of Ukraine "The biological resources and the modern technology of bioenergy conversion"(2013-2017). Authors also thank to Dr. Los S.A. from Ukrainian Institute of Forestry and Forest melioration for providing initial plant material and to Prof. Rakhmetov D.B. from National Botanical Gardens for providing plant material of willow clone 'Zhytomyrska-1'.

Keywords: fast growing trees, *Populus*, *Salix*, microclonal propagation

Inroduction of Magnolia Grandiflora l. in Absheron Conditions, Which Is Widely Used in Planting of Greenery

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Ornamental plants are cultivated to improve social conditions for people, as well as ornamental appearance of its flowers, fruits, leaves and etc. rouse people's interest in nature and assume great importance in enriching the floral diversity.

One of the most widely used plants in greenery is Magnoliaceae Juss – threes and shrubs belonging to the magnolia family. The family has about 250 species in six genera. Mainly, this plant is naturally widespread in Northern America, China and Brazil. It is a species of Magnolia Grandiflora included in the magnolia family. Its height is 30 m and its diameter is 10 m in its native land. The plant has an evergreen wide ovoid or large pyramid-shaped umbel with dense leaf. Its stems are flat, gray or light brown-colored covering with bark of 1-2 cm. Sprouts and shoots are covered with orange-colored dense hair-like scales. The leaves are obovate or narrow ellipse-shaped, 12-25 cm long and 4-5 cm wide. Full-edged, round, bright leaves is covered with short dark orange-colored hair from the bottom part and sometimes it is naked. Leaf stalk is 2.5-5 cm long. Blooming begins from the end of May and continues to September. Rarely, the second blooming is observed in October and November. Flowers are born on one-year old shoots located one by one. There are plenty of stamen and pistils in flowers. Creamy white flowers with an intensely sharp aroma are quite large with a diameter of 17-22 cm, length of petals equals to 13 cm and width equals to 11 cm. Perianth which springs out is ovate or oval-shaped with skin-like surface consisting of 6-9 or 12 parts. The length is 7.5-10 cm, width is 2-5 cm. Seeds are ellipse-shaped with 6 to 8 cm long, there are red when ripe and then turn dark. It is a light-loving plant and not drought-resistant.

It is cultivated in Azerbaijan, Baku, Ganja, Lankaran, Zagatala. This plant is bred by seeds and seedlings in the Mardakan arboretum. During the propagation from seeds, either the seeds were planted upon they collected in autumn or they were kept for 3-6 months at 0-3 degrees Celsius, and then planted in spring. The Magnolia Grandiflora L. was bred by seedlings mostly in the spring from green species. The seedlings were kept in the water upon taken from the plant. Magnolia Grandiflora does not like soil with gypsum. The seedlings cut from the plant were planted in plenty of peat and sand mixed soil on special pockets. The stratification of seeds is one of the main conditions for spring sowing. Magnolia bred by seeds grows very slowly and blooms in 8-10 years. The seedling requires special care in the first years of growth. One should be careful when transferring rooted seedlings to a special pots or open plot of land. As their roots spread out close to the soil surface, it is important to transfer the seedlings without damage to roots or the plant will be lost. After the plant grows its fallen leaves or fallen leaves of other trees serves as the natural fertilizer. As its roots tend to be concentrated near the surface of the soil, you should be careful to avoid damage. The plants bred by seedling began bloom in three year of its growth.

Magnolia grandiflora L. has scientifically been studied. It is advisable to use this plant in greenery and landscape architecture as it has very large and beautiful aromatic flowers.

Introduction and Cultivation of *Orqanum mayorana* L. in the Institute of Dendrology NAS of Azerbaijan

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Aim of the study: Soil and climatic conditions of Apsheron favorable for the cultivation of many medicinal and aromatic plants. *Orqanum mayorana* L. from the family of *Labiatae* and grows in different ecological conditions. There is high variability of this species by number of fruit and flowers. In work has been analyzed the introduction species of *Orqanum mayorana* L. and studied phenophase, economic and medical value in Absherone. *Orqanum mayorana* L. have been introduced in the Institute of Dendrology from Nakhchivan.

Material and methods: *Orqanum mayorana* L.is a heat-loving plant. Seeds begin to sprout at 12-15 ° C, but the optimum temperature for sprout is 20-25 °C. Seedlings do not tolerate frosts and die already at -2 °C. The all *Orqanum mayorana* L. can be attributed to drought-resistant plants; it shows an increased demand for humidity only at the beginning of growth, but with a lack of humidity decrease yields. *Orqanum mayorana* L.is light-requiring, shading reduces the yield and aromaticity of plants blooms in July - August flowers are small Fruit is an egg-shaped smooth nut let. All over ground part of *Orqanum mayorana* L. contains 0.3-0.5% of essential oil.

Flora of Azerbaijan is rich in essential oils. Most of them are useful plants that are widely used in various places by the agricultural economy. In the conditions of Absheron has been studied on a scientific basis, biological properties and the induction of *Orqanum mayorana* L. species.

Results: Studies of bio-morphological feature and revealing possibilities of cultivation and value in medicine.This plant belongs to the genus of perennial herbaceous plants from is family of the umbellate. *Orqanum mayorana* L. is exceptional decorative aromatic grass. It is native place of *Orqanum mayorana* L. is the Mediterranean region. Depending on the species of *Orqanum mayorana* L. is considered an annual plant. The plant likes fertilized soil and sunny sites.In fruits, seeds and leaves of Orqanum mayorana L. has found various useful substances used in medicine, confectionery industry and etc.Culture is cultivated as an annual herbaceous plant. The optimum temperature for growing seeds is 200-230 C. Seeds can last 2-3 y. With poor lighting *Orqanum mayorana* L which is demanding lightarea are collection of essential oils is weak.During flowering, it contains 0.7-3.5% of essential oils in its composition compared with age. The essential oil content is terpenin. The composition of essential oils is saponin, terphenol and benzenephenols.

The purpose of study is morphological and biological features and identifies opportunities for the cultivation and importance in medicine.

Keywords: *Orqanum mayorana* L., propagated, seed, features, saponin, terphenol.

Introduction of Casuarina Equisetifolia l.Species in the Environment of Absheron

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Aim of the study: A scientific-research works have been conducted in the "Introduction and acclimatization of shrubs and tress" laboratory of the Institute of Dendrology of ANAS for the study of growth and development of Casuarina equisetifolia species in the environment of Absheron,its stages of phonological development,suitable breeding methods and drought and frost resistance.

Material and methods: Casuarina L. species (Casuarinaceae R.Br.family) include a few species. Casuarina equisetifolia was introduced with seeds in Azerbaijan in the 70s, and it takes an important place in the collections of the Institute Dendrology at present. This is an evergreen and slender tree growing to 10-15 m height. Its grey to brown stem is narrow and cone-shaped which then takes wide pyramid shape. On its elastic droopy branches there are thin and segmented dark green twigs and minute scale-leaves that not well developed, which make them resemble equisetum arvensum. Superficially it looks like conifer cone. Yet for its small and sometimes invisible scale-like leaves lined up on conifer-like twigs, casuarina have been included into the family of broadleaves. Conifer-like leaves are 13-17 cm long and spiky. Droopy conifer-like leaves an the layered solid stem have been located one by one or in pairs on dark brown or dark grey twigs. The plant is dioecious, and blooms in Absheron in October. Its spiky and small spherical flowers are located in groups. Male flowers are brown, female ones are red. Afterwards such flowers turn into cones. The diameter of balloon- shaped cones equals to 2.5 cm, 1-1,5 years later they produce fruits. There are light yellow cone-shaped seeds with 3,3 mm length and 0,2mm width in the beehive-like holes in the fully grown cones. It has winged seeds.

It is naturally widespread in Australia. Tasmania and India. Being drought-resisting, the plant needs least amount of soils for development, since it can normally develop in barren and sandy lands. It endures well against unsuitable climate and soil conditions of Absheron. Its root perishes to its upside part, yet they are recovered via shoots.

Results: Casuarina equisetifolia is bred by seeds and seedlings. Suitable period for seed sow is spring. Seeds sown in the II ten days of April begin to grow 10-14 days later. Growth rate of seeds amounts to 75-80%. The I year the shoots grow to 10-14cm, II year to 25-28cm, and III year to 36-45cm. For mature ones, growth starts in the beginning of April depending on climatic conditions and continues till the end of October. Annual growth is 15-18cm. The rate of turning into root for the shoots grown in the beginning of spring is 35-40%. Stages of phonological development were studied and it was found that, blooming continues from the I ten days of October to the I ten days of December. Seeds fully grow in September.

This is a considerably significant plant which is widely used in industry. Its wood is used to make furniture, musical instruments, ships and some parts of airplanes. There is ether oil in its leaves and it is added into the medications that are widely used in treatment of gastrointestinal problems in medicine. Since Casuarina equisetifolia L. is evergreen and perennial, it can reasonably be used in greening, fencing and single and group seedlings.

Keywords: Family, clade, introduction, growth, breeding.

Introduction Some Species of *Ligustrum* L. Used in Landscape Architecture of Absheron

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Aim of the study: In the Institute of Dendrology of ANAS carried out comprehensive scientific research works in order to increase the collection fund with new plant species and to study the bioecological features, introduction and climate change on the scientific basis. One of the promising ornamental plants is the species *Ligustrum* L. which can be successfully grown in the climatic conditions of Absheron. It also grows in other soil-climatic conditions of Azerbaijan. In the presentspecies Ligustrum L. are cultivated in parks and squares as decorative plant.

Material and Methods: In the Institute of Dendrology have been studied biodiversity and properties two species of *Ligustrum vulgare* L. and *Ligustrum japonicum* L.

Ligustrum L. is an evergreen, leafy and flowering bush or small tree. Which includes the *Ligustrum* L. belongs the family *Olecea* L. these species are spread throughout the Himalayas, China, Japan, and Taiwan in different parts of Europe, North Africa, Asia and Australia.

Some species of *Ligustrum* L. have been introduced at the Institute of Dendrology which is a small bush and less than 5 meters below the tree. The lower parts of these leaves of thus plants are suprastive, simple, spear-shaped, bark, dark green. Some species are less resistant to frost in Absheron. The flowers are white, in June-July they are blossoms in compact crown form. The flowering period continue is 15-20 days. Fully ripe fruit of that dates to November. Its fruit is a bright round berries. Fruits are mostly in black, which is in the form of a circle.

The growth of the species studied is mainly noted in two stages: spring and autumn. It is growths in May and June. In the midsummer, the hottest month in July, the growth is weakening or stagnating (in the period when the humidity decreases).After the second decade of August, the temperature and humidity relatively decrease as a result of increasing of II growth is observed. Depending of the species the fruits are ripening, starting from the end of July continues to November. The fall of the leaves is dependent of the conditions climatic. The moderate and humid last autumn the leaves are yellowing and fall continue for a long time. This plant is not very demanding to water. They are usually considered valuable decorative tree and bushes. This plant is widely used in landscape design, urban and gardening. The preparing a special place for this valuable and rare species propagate with shoots and also propagate with seeds.

Results: The article are gives information have been introduced about some of decorative trees and bushes in the Institute of Dendrology of ANAS, introduced 6 species of *Ligustrum* L. two of them *Ligustrum vulgare* L. and *Ligustrum yaponicum* L.studied its biological characteristics, they are widely used in landscape architecture of Baku city and Absheron.

Keywords: *Ligustrum vulgare* L., *Ligustrum yaponicum* L., propogation, leaves, seeds

Investigation of Changes in the Humus State of Soils on the Old Oil Fields of the Absheron Peninsula

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Purpose of the study: The purpose of the study is to track the dynamics of humus soil condition in old oil fields of the Absheron peninsula of Azerbaijan using the bioremediation method. Strengthening the humic composition, improving the fertility of such soils by the method of bioremediation allow us to partially regain the turnover of such soils and improve the ecological state of the environment.

Material and methods: For the experiments, an old oilfield zone was selected in the village of Kala, Absheron Peninsula. Three sites with dimensions of 4m x 4m (16m2) were chosen for planting the following plants: Carpobrotus (*Carpobrotus*), Yucca (*Yúcca*) and Sorghum (*Sorghum*). Between the sites, distances of approximately 25-30 m were selected, ensuring the adequacy of the initial conditions for the soil indexes for the selected three precincts.

Prior to planting, soil samples from three sites were taken. Then plowing was carried out on three plots, a special compost based on organic materials with reinforced bioactivities was introduced. Composting is done with the calculation of 10 tons per hectare. Based on these calculations, 16 kg of special compost was added to each site. After that, the selected plant was planted on the three specified sites. The experiments continued for 6 months. After completion of the experiment, samples of soils for analysis were taken in a secondary manner.

Results: In the laboratories of the Institute of Soil Science and Agrochemistry of ANAS, analysis of soil samples taken at a depth of 20 centimeters were made from each of the three sites separately. For each site, two samples were taken from the same depth. Samples were taken before the experiment and after the completion of the experiment. Based on the analysis of soil samples, the following results were obtained. In all three samples, under the influence of the plant, Carpobrotus (*Carpobrotus*), Yucca (*Yúcca*) and Sorghum (*Sorghum*), the humus content increased. That is, in all three selected sites, the creation of favorable conditions for improving soil fertility was observed. In the case of the Carpobrotus plant (*Carpobrotus*), the humus content in the soil increased by 16%, in the case of Yucca plants (*Yúcca*), the humus content in the soil increased by 26%, in the case of Sorghum plants (*Sorghum*), the humus content in the soil increased by 19%. The relative high increase in humus content in the soil was observed in the case of Yucca plants (Yúcca). This result is due to the fact that Yucca plants (*Yúcca*) are less demanding of nutrients in the soil compared to other plants.

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Key words: humus; soil; bioremediation; crop rotation; compost; bioactivator.

Main Plant Groups of Bozgir Plateau of Azerbaijan

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Aim of the study: It is located between the southern macro slopes of the Azerbaijan-Greater Caucasus and borders of the Little Caucasus, between the Alazan-Hafken valley, it is is bounded with Ganx-Haftaran valley approaching the monoclinal series on its northern border, the Kura River shore at the southern border, sword-shaped ridges Ceyranchol in the west, and Bozdagh in the east. As regards the natural vegetation of the Bozgir Plateau, this area is very complex due to its geographical position, and its lands are of different type. Here, widespread semi-desert plant groups have landscape character. In some cases, frigate-type plants are found mainly in erosion areas and slopes, in unfavorable areas. Stems-resistant plants in the form of spots, spread on the edges of the river, especially lenticular Tugay forests spread on the shore of Kura River. Taking this into consideration, study of plants in this area was set as a goal.

Material and methods: Studies were carried out by semi-stationary and stationary methods, more than 250 geobotanical notes have been taken from the phyto gene structure, separately photos of rare species and forms were taken. The herbarium of all species collected and handed over to Herbariums. Classical and modern botanical-floristic, systematic, ecological, archaeological and statistical methods have been utilized in development of collected herbicides. Commonly accepted methodologies of "Programs for geobotanical research" [1932], "Methodology of field geobotanical research" [1938] and etc., were used in geobotanical research. Based on ecological-phytocenological and dominant principles used in the geobotany for the classification of plants, the methods of A.R.Ilinsкi [1935], V.V.Alex [1950], R.D.Yaroshenko [ ], A.R.Shennikov [1964], T.A.Rabotnov [1950], Y.M.Lavrenко [1982] and V.J.Hajiyev [1986] were used. On the basis of modern methods provided on the Internet pages the plant has been designated.

Results: The area has a semi-desert landscape. It contains desert arid forests with the desert and semi-desert plants, xerophyte bushes, juniper and gum trees. In the semi-desert group, *Artemisia fragrans* is usually widespread with other plants along with pure root and salsola. Concentrated primitive plants of *Halocenum strobilaceum*, *Petrosimonia*, *Suaeda*, *Hallimione* species are often seen around Ajinohur lake. *Gamanthus pilosus* groups in Jeyranchol basin are relatively widespread. In Bozdagh Ridge and other areas, *Salsola nodulosa* often dominates. In dry areas, slopes, there frigate-type plants with small bush mixed with barbed *Atrophaxis spinosa, Kochia prostrata, Caragana granadifolia* and others are also widespread. Wetland plants in the area occupy the second place. On the banks of the river Arundo donax, and in the wetland and waterfall areas *Phragmites australis* form jungles. Perennial halophytic plants of *Anabasis aphylla, Atraphaxis angustifolia, Kochia prostrata,* and annual plants of *Gamanthus pilosa, Salicornia europaea* and other species are encountered individually and in combination with other root crops, also *Atrophoxis spinosa* is widely used in juniper woods in the Bozgir Plateau.

As a result of the systematic and phytocenological research conducted in the region, rare and endangered plants belonged to 46 family, 83 genus, 103 species were found, and they will disappear from the flora of the republic for about 10-15 years if special protective measures are not taken.

Acknowledgements: We kindly express our gratitude to Professor Sayyara Ibadullayeva for her assistance in the determination of the Bozgir plateau plant and the study of plant species.

Keywords: Bozgir Plateau, semi-desert, water-wetland

Microplastic is Consumed and Affects Metabolic Activity of the Copepod *Centropages typicus* in the Marmara Sea

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Aim of the study: Microplastic particles are now found throughout the world's oceans. Recent studies have shown that these particles can by ingested by zooplankton species and later egested within their fecal pellets, which leads to spread of microplastic along the food web. This study investigated ingestion, egestion and effects of microplastic beads on metabolic activities of filter feeders marine copepod *Centropages typicus*, inhabited the Marmara Sea.

Material and methods: Our study design incorporated 24 h feeding assays using a mixture of 6, 12 and 26 μm polystyrene beads at a concentration of 6,000 particles mL-1, in a ratio of 5: 4: 1, respectively. Microplastic consumption rate was determined by the number of pellets and the number of beads in the pellets, produced by one individual during 24 h. At the end of the experiment, the respiration rate of active and anesthetized by magnesium chloride, females and males were measured as indicators of their total and basal metabolic activity. Fecal pellets parameters and content were examined under a microscope and copepods oxygen consumption rate (μg O_2 ind^{-1} h^{-1}) were measured by sealed chamber method using modified luminescent dissolved oxygen sensor Hach LDO.

Results: During the first day after the addition of the mixture of microplastic beads to the filtering water, in 53% of the pellets produced by females and males, were found beads, while 43% of the pellets were empty. According to the amount of pellets produced and the number of beads contained in them, the consumption rate of microplastic by *C. typicus* was 26±16 beads $female^{-1}$ day^{-1}. 95.3±3 and 4.8±2.8% of them belonged to 6 μm and 12 μm beads, respectively, while beads of 26 μm were absent in the pellets. Thus, *C. typicus* showed the ability to selectively prefer small beads of 6 μm of which correspondent the size of the natural food (eg 3-5 μm algae). No pellets were found in the experiments with starved individuals without beads.

In the respiration experiments, oxygen consumption in both active females and males of *C. typicus* was significantly ($p<0.001$) 1.6 and 2.5, respectively, higher than in individuals consuming microplastic, whereas the oxygen consumption of anesthetized individuals was not significantly different. This indicates the inhibition of motor activity in *C. typicus* in a medium with a microplastic.

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Keywords: *Centropages typicus*, microplastic, consumption, metabolic rates, Marmara Sea

Obtaining and Studying the Radioprotective Properties of New Nanocomposite Compounds of Precious Metals

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Aim of the study: The work is devoted to the development of new nanocomposite compounds based on biologically active substances of vegetable origin immobilized in their structures of noble metals - Au, Ag and Pt and studying their radioprotective properties.

Material and methods: Natural matrixes - plant polysaccharides isolated from cherry gum (Gummi nostras) growing on the Apsheron peninsula of Azerbaijan were used in the work. By chemical composition is a mixture of polysaccharides $C_m H_{2n} O_n$ and their calcium, magnesium, potassium and other salts. The yield of nanobiocomposites is 85-90%, the content of zero-valence metals is from 5 to 60%. The average size of metal nanoparticles is within the range of 20-30 nm.

Experimental work was carried out on mature Wistar rats and on white laboratory mice to animals intraperitoneal 30 minutes before irradiation. Irradiation was carried out in the irradiation unit "Ruhund-20000" in a dose of 7 Gray. The dose rate of the installation was 0.431 rad / sec.

Quantitative changes in lipid peroxidation were studied on the basis of analysis of the concentration of malondialdealdehyde and hydroperoxide in liver tissues of control and irradiated experimental animals. Also, for 3 days, behavioral responses to the open-field model were tested, both in the control and in a given dose of the nanocomposite before irradiation of the animals.

Results: Nanocomposites of noble metals show a positive effect on the metabolic processes of the liver of irradiated animals, reducing the level of harmful compounds, contribute to the partial restoration of motor and analytic activity destroyed by the influence of ionizing radiation.

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Keywords: irradiation, behavioral reactions, nanocomposites, malonic dealdehyde, hydroperoxides.

Obtaining of Phytopatogen-Resistant Tomato and Potato Plants with Human Lactoferrin Gene

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Aim of the study: Development of genetically modified potato (*Solanum tuberosum*) and tomato (*Lycopersicon esculentum*) plants with increased resistance to phytopathogenes carrying human lactoferrin gene (*hLF*).

Material and methods: *Agrobacterium*-mediated transformation of different genotypes of potato (*Solanum tuberosum*) and tomato (*Lycopersicon esculentum*) with human lactoferrin gene (*hLF*). Polymerase chain reaction (PCR) with specific primers to gene of interest (*hLF*) and to marker genes. Biotests on phytopatogene resistance.

Results: Genetically modified lines of potato and tomato were obtained and analyzed. Transfer and incorporation of *hLF* gene into respective plant genomes was confirmed by PCR reaction with specific primers to gene of interest. Preliminary biotests on phytopatogene resistance were conducted out and higher resistance of transgenic lines to them was found.

Acknowledgements: This research was conducted out under the project “Application of lactoferrin gene for construction of phytopatogene-resistant plant lines from *Solanaceae* family” in the frames of complex interdisciplinary research program “Molecular and Cell Biotechnologies for the needs of medicine, industry and agriculture” of Natl. Acad. of Sci. of Ukraine (2015-19).

Keywords: lactoferrin gene, plant transformation, phytopatogene resistance, potato, tomato

Peculiarities of Producing Pellets from Wheat Straw and Aspen Wood

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Aim of the study: Due to depletion of fossil fuels, using biomass, particularly fuel pellets, is a good alternative to coal and oil. Pellets from biomass have acceptable calorific values, and in terms of environmental performance, they are ahead of other fuels because their production and application have less negative impact on the environment. To produce pellets, various types of biomass can be used, including energy crops, wood, agricultural and wood waste. When pelletizing biomass, binder or stabilizing agents are often added to reduce fractures and increase the density and durability of the pellets. Glycerol is known as waste byproduct of making biodiesel. Therefore, the purpose of this study was to determine peculiarities of pellets from wheat straw and aspen wood produced with adding glycerol.

Material and methods: Biomass from wheat straw and aspen wood was grounded with a laboratory extruder to obtain pelleting fractions 3.9 × 1.4 mm in the aspen wood and 3.7 × 1.2 mm in the wheat straw. Prior to pelleting, extruded wheat straw and aspen wood were soaked in water-glycerol solution with mass fraction of glycerol 1 and 5% or in tap water (control); 250 ml of solution per 500 g of raw material was applied. Pellets were produced by laboratory granular machine with a flat matrix and two pressing rollers and bulk density as a pellet's characteristic was measured. The mass per unit volume gave the bulk density of the biomass in kg/m^3. The bulk density was determined in three replicates for each sample.

Results: The results of the experiment have shown that the addition of glycerol significantly improves the quality of the pellets, both from wheat straw and aspen wood. Compared with the control variants, soaking the biomass in the aqueous solution of glycerol (1%) increased the bulk density of the wheat straw pellets by 11%, and pellets from aspen wood by 12%; and soaking extruded biomass in 5% glycerol solution increased the pellets bulk densities by 16% and 18% respectively. Thus, results of current study offers practical benefits for alternative energy.

Keywords: Biomass, pellets, wheat straw, aspen wood, glycerol, bulk density.

Plant Genetic Modifications and Biodiversity Keeping in Aseptic Culture Conditions

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At present, biotechnology could be as a new tool in conservation of genetic diversity of natural flora species. The biotechnology could be applied to the conservation of genetic diversity of plant species by direct and indirect ways. Directly - preservation of genetic diversity of the meristematical or callus *in vitro* culture, and restoration of numbers in the natural conditions those species which has ability to regeneration *in vitro.* Indirectly - production of secondary compounds in *in vitro* culture without utilization of raw plant materials grown in the natural conditions. Also cultivated plant material can be used as a reproducible source for genomic research and could be as a new source for screening for new compounds with pharmaceutical and agrochemical activities. The institute collection of cultivated plants *in vitro* consist of about 2000 lines. The most numerous representatives of *in vitro* bank are such families as *Compositae, Leguminosae, Labiatae, Caryophyllaceae, Rosaceae, Liliaceae, Papaveraceae, Ficoidaceae, Solanaceae, Graminae, Campanulaceae, Cruciferae, Ranunculaceae, Scrophulariaceae, Polygonaceae, Iridaceae, Cactaceae, Apiaceae, Primulaceae, Ericaceae, Crassulaceae, Malvaceae, Geraniaceae), Gentianaceae, Saxifragaceae, Caprifoliaceae, Aizoaceae, Rubiaceae, Berberidaceae, Betulaceae, Plantaginaceae, Apocynaceae, Verbenaceae.*

Experiments with nuclear and chloroplast transformation of plants are carried out in institute. Transgenic plants of agronomically important species that have been produced in the institute will be presented. The plastid genome has become a new attractive target for genetic manipulation compared to the nuclear genome of the plant for many reasons. One of those is that the risk of gene release into the environment is essentially eliminated because chloroplasts do not move into pollen in most agronomically important plants. However, plastid transformation of higher plants has been proven extremely difficult, particularly in agronomically valuable crops. New approached for chloroplast transformation will be demonstrated.

Plants as a source of recombinant proteins have important advantages over microbial or animal cell systems, e.g. possibility to obtain proteins with post-translational modifications free of bacterial toxins and animal viruses. However the level of foreign proteins in transgenic plant systems is often too low. Alternatively, transient expression of foreign genes allows to produce large amount of recombinant proteins within short time. It will be reported methods for optimization of transient expression protocol in several species using green fluorescent protein (GFP) as a reporter protein.

Potyviruses Infecting Economically Important Crops in Ukraine

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Aim of the study: to investigate viruses of *Potyviridae* family infecting economically important crops in Ukraine.

Material and methods: indicator plants, transmission electron microscopy, DAS-ELISA, RT-PCR, sequencing, phylogenetic analysis.

Results: Our research has shown that potyviruses are wide spread on economically important agricultural crops in Ukraine: WSMV – on the winter wheat plants, PVY – on the potato and tomato, and SMV – on soybean. The frequency of SMV in Poltava and Sumy regions (ELISA) was 48%. This is the first report about SMV affecting of soybeans grown in left-bank forest of Ukraine. Due to the previously reported data of soybean infection in Ukraine with *Alfalfa mosaic virus* and *Bean yellow mosaic virus* (Sherepitko, 2012: Kyrychenko et al., 2012) studied samples were tested on the presence of these pathogens. ELISA results showed no antigens of BYMV and AMV in all tested samples. It was revealed that the length of investigated SMV virions differs from previously isolated SMV strains in Ukraine. It was found a small percentage of seed transmission of Ukrainian. SMV isolates. This is due to properties of the studied isolates and localization of viral antigens in seminal peel and further hit in the cotyledons, but later the virus not transport is in trifoliate leaves. Our research is revealed that spotted seeds do not always mean a viral etiology, and can be a sign of varietal characteristic or aftereffect of fungal or bacterial infections (Mishchenko et al., 2016). Phylogenetic analysis of the nucleotide sequence of the capsid protein gene part of SMV isolate from Poltava region (Pol-17) and 36 isolates and strains of this virus from GenBank showed a 100% level of phylogenetic relatedness between the Ukrainian representative isolate and Chinese, Iranian isolates, American isolate 452, and Polish isolate M, which testifies to their common origin (Dunich et al., 2016; Mishchenko et al., 2017).

In 2005-2016 new symptoms, which were not described before on tomatoes, are revealed on 36 cultivars of tomato plants (*Lycopersicon esculentum* Mill.) in four regions of Ukraine. The frequency of these symptoms was ranged from18 to 25% of all surveyed tomatoes in these regions. Presence of PVY and PVM in tomato plants was detected with ELISA and RT-PCR. This is the first report about the infection of tomato plants with such viruses in Ukraine (Mishchenko et al., 2013). The percentage of tomato plants affecting with PVY ranged from 16.7 to 22.2% depending on growing region. Some biological, physical and chemical properties of the pathogens are studying. Differences between tomato isolates of PVY and the known isolates were found in in the range of indicator plants and their reaction to infection. The results of our experimental studies have shown that in addition to the fact that in some cases, PVY+PVM spoil the appearance of tomato fruit, they significantly affect product quality of tomato fruit in decrease the content of lycopene and β-carotene in 1.3-3.5. It should be noted that PVY-to causes the greatest decrease as the concentration of lycopene and carotene and compared with PVM monoinfection and their mixed infection, indicating that its high harmfulness for tomatoes.

Long-term studies show that today *Wheat streak mosaic virus*, WSMV and *Barley yellow dwarf virus*, BYDV are the most widespread viruses in cereal crops in Ukraine. These viruses alternately replace each other in certain regions (Mishchenko, 2009; Mishchenko et al., 2014; 2016). As a result of a comprehensive study of the properties of Poltava isolate of WSMV by classical, molecular and physical methods set we revealed that this isolate belong to tritimoviruses, related to the North American isolates (Mishchenko, 2004; 2009). It is concluded that WSMV infection in resistant and susceptible plants leads to opposite changes in some parameters of the photosynthesis, respiration, and membranes vision and protein composition.

Acknowledgements: The authors are grateful to colleagues from Center for collective use, Danylo Zabolotny Institute of Microbiology and Virology of National Academy of Science of Ukraine for help with TEM investigations.

Keywords: *Potyviridae*, PVY, SMV, WSMV, soybean, tomato, wheat.

Proteomics Approach of Crosstalk in Cell Signaling Investigation

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Aim of the study: Due to the worldwide adverse contamination of environment it is important to study molecular mechanisms of a plant's perception of separate stress factors and their combinations. The primary focus of this research is on understanding of signaling pathways and their crosstalk, thus elucidating specific and nonspecific components of plant adaptation responses to salt and radiation stresses. Crosstalk refers to the phenomenon when one or more components of different signal transduction pathways interact. We used morphometric indexes and proteomics approach to study how pretreatment with ionizing radiation affects pea seedlings reaction on osmotic stress. The aim of our study was to assess the proteome changes of pea seedlings during two days after stress treatments or their combination (ionizing radiation with salinity stress) to understand the phenomenon of crosstalk.

Material and methods: Firstly, we studied morphometric changes in *Pisum sativum* L. seedlings divided in 4 groups: 1) control plants, 2) treated by water solution of sodium chloride in 0.22 M/l, 3) treated by γ-rays in dose 10 Gy, and 4) salt stress applied after γ-rays impact. Roots were used for physiological measurements and proteins extraction. We demonstrated different growth reactions of roots for all experimental groups. After some doses of radiation and salt seedlings had higher growth speed, in comparison with the group after irradiation only. This may indicate to resistant influence of salt treatment. Upon phenol-based extraction, pea proteins were profiled by 2-DE (IPG strips within pH 4-7, narrow-range 7 cm). Software-assisted analysis of Colloidal Coomassie-stained gels revealed quantitative and qualitative differences between protein spots belonging to all investigated groups. Majority of the differentially abundant spots were identified by LC-MS/MS mass-spectrometry and followed by sequence database search.

Results: Key proteins included: Pyruvate dehydrogenase E1 component subunit beta (mitochondrial), L-ascorbate peroxidase (cytosolic), Lipoxygenase etc. that are involved in in the pathway of some compounds biosynthesis or are the parts of metabolism. The analyzing of proteomic data, using advanced bioinformatics tools helps to accumulate, integrate and interpret functional information. This molecular approach could allow objective insights into biological diversity processes to abiotic stress factors. Proteomic data might also allow us to substantially contribute to the understanding of physiological reactions, including crosstalk of signal systems, likely leading to future biotechnological applications.

Acknowledgements: This work was supported by grants IRSES GA-2013-612587 «Plant DNA tolerance». We thank our colleagues from Plant Science and Biodiversity Centre of Institute of Plant Genetics and Biotechnology (Slovak Academy of Sciences), especially to Katarina Klubicova and Viera Majercikova for advice and support.

Keywords: Pea, proteins, crosstalk, stress factors.

Psychophysiological Mechanisms of Excitement Position in Young People, Depending on the Typological Features of the Nervous System

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Purpose of the work: The main purpose of the dissertation is to find psychological and excitement indicators and changes in brain activity due to the emotional tension caused by the weight of the exam process.The following research objectives are envisaged for this purpose:Understanding psychological and electrophysiological studies in different age groups, comparing the psychophysiological changes generated by emotional stress and to clarify the impact of the emotional tension caused by the severity of the exam on the quality of education.Determination of the background characteristics of the trainees by conducting psychophysiological and electrophysiological studies at one of the ordinary lessons;Comprehensive researches and emotional tension caused by different age group and to investigate the factors that can have serious impact on students' health and develop a preventive action plan.

Material and Methods: Students and masters of Ganja State University will be involved to the research to carry out research on the dissertation. It is important to present practically healthy participants in the research and volunteer participation in research. At least 40 people will be researched in each group. Studies will be conducted in four stages:

I.The first research will take place two months before to determine the psychological background.According to this case,the psychophysiological indicators of students and masters examined during the exam period are determined on an ordinary day ,to compare the changes caused by emotional stress.

II: 30 minutes before the exam -researchers will be conducted psychological examination 30 minutes before the exam.

III.Ten minutes after the exam - those who participated in the research will be subjected to psychophysiological studies 10 minutes after the exams and changes in emotional tension will be detected;

IV: 2 hours after the exam - after 2 hoursthe exam rescues, it is anticipated to identify trace reactions after elimination of emotional stress at students and masters.
Psychological-excitement indicators will be studied during the research,
• Taylor test - to set the level of excitation;
• Spilberger-Khan test - to determine situational and individual excitement levels;
• Ayzenko test - to determine the intellectual situation;
• A.A. Rean test is a test of motivation for success and the fear of failure.
SAN test - self-expression, activity and mood determination.

Result. The study was conducted on 60 healthy students aged 17-22 in young people.Psychotests were used in the study of psychological symptoms:Determination of Intellectual status through the Ayzenko test, individual and situational excitement through Spilberger-Khan's test,the general anxiety and depression scores were tested through lusher test.Experimentshave been carried out in three stages: in one of the usual lesson day; pre-exam period; 2 hours after the exam.The findings show that changes have been made under the influence of emotional tension. Currently, the observed psycho-emotional changes are regarded as an adaptation reaction against the organism's emerging conditions. In stress conditions, the normal activity of a person depends on the course of adaptation processes.Thus, the change of psychological parameters and vegetative parameters during the exam process once again proves the tension of the organism's regulatory systems during this period. As a result of private research, it became clear that psychophysiological reactions appearing in adolescents, depending on the level of effects of emotional stress, occur during the exam.At this point, the degree and duration of emotional vigilance depends on the degree of perception of the factor affecting the objective and the psychophysiological characteristics of the identity.Taking into consideration the adolescents' self-esteem before the exam, adapting to the real exam process by creating conditions similar to the exam process, some psychological conversations, etc.it is possible to reduce the level of emotional tension.

Key words: adaptation, test stress, stress-reaction.

Radiation Carcinogenesis: Biological Aspects and Prevention

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Aim of the study: Analysis of the problem of radiation carcinogenesis and its prevention. A constantly deteriorating radio ecological situation leads to an increase in the level of cancer incidence of the population, due to an increase in background radiation in many regions because of the development of nuclear industry, the effects of radiological incidents and accidents, the problem of disposing of used nuclear fuel, decommissioning of nuclear reactors out of service, etc. This increases the possibility of human exposure to ionizing radiations in small doses, which are the cause of the stochastic effects, including carcinogen ones. The variety of radiation-induced biological reactions is due to the individual radiation sensitivity of the human body.

Material and methods: lymphocytes of the human peripheral blood, chromosomal G_0 and G_2 tests.

Results: Analysis and compilation of large-scale radiation-epidemiological studies proves the following: (I) the ionizing radiation is one of the etiological factors of cancer; (ii) there is an urgent need for the improvement and implementation of primary prevention of radiogenic cancer. This prevention is conceptually linked to genetic and epigenetic determinants of radiation carcinogenesis. Epigenetic changes (gene functions) as opposed to genetic, are potentially reversible, so there is an opportunity to reduce cancer risk. A high number of radiosensitive individuals highlights the need for primary prevention of radiogenic cancer at the individual level. The solution to this problem lies within the definition of individual radiosensitivity of healthy individuals (chromosomal G_2-radiation sensitivity assay) and justifies formation of groups with increased cancer risks. There are relevant studies aimed at increasing the radioresistance of the human cells' genome and thus reducing cancer risk. The identification of key genetic factors, which indicate the highest individual radiation-induced cancer risk, is a priority measure for the prevention of disease. We have developed a new strategy of primary prevention of radiogenic cancer, reasoned by the data of cytogenetic studies. This strategy includes the following steps: an estimation of individual radiation sensitivity of healthy individuals; a record of the impact of co-mutagens; a use of non-toxic effective radioprotectors.

It has been shown for the first time that the prevention of the development of stochastic effects of the above-ground levels of irradiation can be carried out at an individual level.

Keywords: irradiation, stochastic effects, radiogenic cancer, prevention.

Recent Fish Fauna of Sula, Psel and Vorskla Rivers Basins (Left Tributaries of Dnipro River, Ukraine)

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Aim of the study: The Sula (length 363 km), Psel (717 km) and Vorskla (464 km) rivers are the largest left tributaries of the Middle Dnipro. They are important for the conservation of a large part of the fish diversity, for example from the Red Data Book of Ukraine and Resolution 6 of the Bern Convention. But latest the fish population of these rivers, its qualitative composition, were investigated in the 70's or 60's of the XX century.

Material and methods: Field researches were realized from June to September 2017. The fishes were caught using standard methods. After counting the number and determination of the species, the fish were released back to the rivers. Total were studied 73 locations. In addition to the main rivers, tributaries were investigated – 10 rivers in the Sula basin, 5 rivers in the Psel basin, 9 rivers in the Vorskla basin.

Results: In total, we found 38 fish species: 24 species in Sula River basin, 32 – in Psel River basin and 31 in Vorskla River basin. Four species are listed in the Red Book of Ukraine: *Leuciscus leuciscus* (Linnaeus, 1758), *Alburnoides rossicus* Berg,1924, *Carassius carassius* (Linnaeus, 1758), *Lota lota* (Linnaeus, 1758). Another five species included in Resolution 6 Habitat directive of the Bern Convention, that is the basis for the creation of the Emerald Network in Ukraine: *Aspius aspius* (Linnaeus, 1758), *Rhodeus amarus* (Bloch, 1782), *Cobitis taenia* Linnaeus, 1758 (s.l.), *Sabanejewia baltica* Witkowski, 1994, *Misgurnus fossilis* (Linnaeus, 1758). Thus, based on the obtained results, a number of key areas for the Emerald Network can be created. On the other hand, it was found only four alien species: *Perccottus glenii* Dybowski, 1877, *Lepomis gibbosus* (Linnaeus, 1758), *Pseudorasbora parva* (Temminck & Schlegel, 1846), *Carassius auratus* (Linnaeus, 1758). These species were mostly found either in ponds or in regulated sections with a slow flow, or at the mouths close to the Dnipro.

Keywords: Dnipro River Basin, Psel, Sula, Vorskla, alien fishes, native fishes, Ukraine

Seed Propagation of Celery (*Apium graveolens* L.) Under Absheron Conditions, the Study of Medicinal and Biological Properties of the Plant

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Aim of the study: Celery (*Apium graveolens* L.) grows and propagates very well based on the results of the study performed at the institute of Dendrology and literature materials. We have studied biological properties, seed propagation, dynamics of the growth and natural healing capacity of celery under Absheron conditions.

Materials and methods: In Caucasus, including Azerbaijan only one species of celery (*Apium graveolens* L.) occurs. Wild and cultivated species of celery are commonly spread in Europe, India, North and South Africa, America and other countries. It is a biennial plant with 80-100 cm height. The plant stalk is hollow with numerous vertical stems. It flowers in June-July and fruit appears in July-August (September). The fruit is two-seeded, 2 mm in length and oval. Celery is cold tolerant, and hygrophilous. The flowers are small, white and gathered in a complex umbrella. Flowers have no cups. Brown, round roots reach a depth of 18-20 cm in the soil. Fragrant celery is widely spread in Absheron, Kur-Araz, Lankaran lowlands, sandy shores of the Caspian sea, saline soils and weedy places in Azerbaijan.

Stalks, stems, leaves, fruit and roots of celery are used as a medicine and food. It improves appetite and plays an important role in increasing tonus of the organism. All parts of the plant contain essential oils. Thus, essential oils were found to be distributed in the plant parts as follows: 0.1% in leaves, 0.1% in roots and 2.4-3.0% in fruit. So most essential oils are in fruit. The pleasant fragrance of essential oils is due to the mixture of lemonene, selinene and the palmitic acid in their composition. Nutrients play a positive role in the regulation and normalization of the function of mucous tissues. Therefore, patients with gastric and duodenal ulcers should use fresh, cooked and pickled celery in their foods. Compounds contained in celery play an important role in cleaning the organism from salts and slags. It was found to be an irreplaceable preparation in the treatment of neurosis, weakened nervous system and sleep disorders. Therefore, daily consumption of celery is recommended by doctors.

Celery clears kidney and bladder, absorbs stomach gases. The mixture of barley flour with celery is useful for the tumor treatment. The root and the leaf of celery kept in honey for a long time is used against nausea. Alkaline salts dissolved in celery facilitate the protein absorption process leading to balancing acidity - alkaline processes, prevent the organism from premature aging, calm the nervous system and stop obesity.

Conclusion: Seeds of celery were used as a planting material in the experimental field of the laboratory of “Medical botany and phytotherapy” at the institute of Dendrology, ANAS. Beds were sown in the field on 16 Mart, 2017. As seeds were small they were planted at a depth of 0.5-1.0 cm. First sprouts appeared on 10 April. Germination percentage of seeds were 79%. In the first year after sowing only leaves appeared. Flowers and fruit emerged in the second year. Productivity was 6-8 kg per $1m^2$ field area.

Keywords: celery, seed, propagation, germination

Sequence Diversity of the Gene Coding for Drought Related Transcription Factor WRKY in Selected Ukrainian Wheat Cultivars

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Aim of the study: Drought is one of the stress factors that have great impact on crop development and productivity. Limited water availability significantly reduces yield of major crops, such as bread wheat (*Triticum aestivum* L.) in many regions all over the world. Therefore, increasing drought tolerance is a big challenge faced by the wheat researchers and breeders. The aim of this study was to investigate sequence polymorphism of genes coding for transcription factor WRKY2, which was previously shown to impact drought tolerance, in order to reveal alleles related to the stress response in selected Ukrainian wheat varieties.

Material and methods: Genomic DNA isolated from three drought tolerant wheat varieties (Astarta, Odeska 267 and Podolianka) and two susceptible varieties (Darunok Podillya and Poliska 90) registered in Ukraine, were used as templates to amplify *TaWRKY2* gene fragments by PCR. Specific primer pairs for amplification of *TaWRKY2* gene fragments were designed based on the coding and genomic sequences available for wheat (GenBank accessions EU665425.1 and NMPL02154244.1, respectively). Prior to sequencing, the generated DNA fragments were cloned into the PCR cloning vector pMD-19 (Takara). The obtained sequences were analyzed with the CLC Main Workbench (Version 6.9.2, Qiagen) software.

Results: Using the specifically designed PCR primers, the whole genomic fragments of the *TaWRKY2* gene were amplified for 5 Ukrainian bread wheat varieties with contrast drought tolerance. Alignment of the obtained variety-specific *TaWRKY2* sequences revealed at least 2 indels and 3 single nucleotides polymorphic sites (SNPs) both in coding and noncoding intron regions of the gene variants in the analyzed wheat varieties. Detected sequence variations in the gene exons might result in changed amino acid sequence and therefore altered protein structure of the transcription factor, which could subsequently influence the regulation of downstream gene involved in drought responses. The generated data may be further applied to study molecular mechanisms of drought tolerance in wheat, as well as for the development of new molecular markers for marker assisted breeding. The fine regulation of protein activity may apply as well as preferable allele combination for stable grain yield.

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Keywords: common wheat, drought tolerance, TaWRKY2, marker assisted breeding, food security

Soil-Plant Relations in Eroded Areas of Aghdash Region, Azerbaijan Republic

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Aim of the study: The article deals with information about erosion factor and life cycles of plants under various salinity conditions in Aghdash region. The researches revealed the life cycles of plants under normal and saline conditions as follows: 31 species with 100-80% factor were considered to be “healthy”, 11 species with 56-69% factor – “weak”, 15 species with 49-20% factor – “very weak”, and 3 species with 19% factor were considered to be “totally destroyed”.

Scientific researches were carried out for the assessment of areas which underwent erosion and degradation under extreme salinity. Relative topographic humidity index and erosion index of the territory were studied based on the assessment of degradation models. Consequently, the results of seven differences, from extremely saline territories under sprinkler irrigation system in Aghdash, were added and erosion index was determined for each chosen area. The low danger index is 68-100, average is 34-67, and high is 0-33. In this case, following the study of the seven differences, the index 40 of erosion equals to the average index. And it means that 18-20% of plants are destroyed in the flora system of the territory. The extreme salinity caused to a total erosion of some agro phytocenosis. The agro biodiversity is destroyed in such territories and invasive species adapted to the environment.

Material and methods: The researches were conducted in 2017. Territories with different salinity were chosen in Aghdash region of Azerbaijan. Many photos of salinized phytocenosis and agro phytocenosis were taken, and researches were carried out.

Life cycle indices of plants (HFG) was defined by V.A.Alexeev [1989] method with the following formula:

$$HFG = \frac{100n_1+70n_2+40n_3+5n_4}{N}$$

Here, n_1, n_2, n_3, n_4 is the number of healthy, weak, very weak and dried plants; *100, 70, 40, 5* is the index of life cycle level of healthy, weak, very weak and dried plants, %; *N* is the total number of plants.
Relative topographic humidity index and erosion index of the territory were also studied in Aghdash.

Results: The researches in the saline territories of Aghdash revealed that some phytocenosis underwent salinization and improper irrigation triggered the destruction of biodiversity in agro phytocenosis. As to the methodology, the maximum index of the relative topographic humidity index (TRMI) is 60. However, this index is not more than 20 in Aghdash in summer months. Being an important factor, which affects erosion process, it has been studied. Slope angle: max. 60; Height and hard foundation: together max. 60; Additional TRMI: together max. 60
After adding the results of seven differences in saline territories of Aghdash the erosion index for each area (SEI) is calculated by the following formula:

$$SEI = \frac{\text{total of the numbers}}{\text{total of maximum units}} \times 100 \qquad SEI = \frac{80}{180} \times 100 = 44$$

As to the methodology, the low danger index is 68-100, average is 34-67, and high is 0-33. In this case, following the study of the seven differences the index 40 of erosion equals to the average index. And it means that 18-20% of plants are destroyed in the flora system of the territory.

Key words: life cycle of plants, erosion index, topographic humidity

Some Features of The Dynamics of Socio-Ecological Behavior

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Consideration of the dynamics of the functioning of environmental relationships, that is, a process that reflects the nature and dynamics relationships, historically formed between society as a kind of naturally-historically developed phenomenon as the "central object" and the surrounding natural environment, serving as a system that includes virtually all the totality of facilities and conditions necessary to maintain life of society, involves the implementation of a thorough analysis of a number of factors that are already one of their existence in one way or another have a deterministic effect on the given process.

Not stopping attention to those of them that have been repeatedly became an object of research interest and a subject more or less careful consideration by a whole group of scientists, I would like to mention some of the less researched ones. Such to us, in particular, are represented by:

- phenomena and events of a global nature accompanying the process evolutionary development (at least at the planetary level) itself the natural environment of mankind - its natural environment;
- social evolution, accompanied in its development significant adjustment (up to the acquisition by it, in some cases, of a system of socially significant values (in which as necessary structural-determining elements includes a whole range of values as a natural, natural origin, and those created by humanity itself in the course of socio-historical development);
- specifically taken in each individual historical period of time sociogenesis structure, system, as well as the nature of the social order;
- features (essence, specificity of formation, orientation and etc.) of environmental ethics, reflecting the nature and essence of existing or emerging environmental relationships, etc.

As for the direct object of our study, in As such, we chose a phenomenon phenomenal in its essence, which significantly influences both character and direction formation of the above (ecological) relationships psychological aspects of the formation of environmental issues - relations between society and its natural environment as the necessary factor of its existence, the nature and dynamics of their changes, the psychological mechanism of this process, etc.

(Our recognition of this factor as a phenomenon is connected with that conventional wisdom in the modern scientific community, according to which man (and therefore society) is the only one creature from all that exists, able to form a subjective (not biologically spontaneous, as in other representatives of the biosphere, but consciously-purposeful) attitude towards their "ecological partner, "that is, to their own natural environment). Ecological catastrophe, so carefully "prepared" humanity in the course of, you can say, the whole relatively short-lived (in comparison with the natural origin of global processes) time of his conscious existence, was the consequence of his boundless and reckless egocentrism.

This (human) egocentrism (especially on the more complex and acute, social level of its manifestation) found it’s a visual reflection in two internally interconnected moments, accompanying the entire course of socio-historical development:

1) in the process of socially significant, practical-transformative, the only "reasonable" goal of which can be considered except that the desire of humanity to the fullest satisfaction their ever-increasing material needs;

2) in the nature of the formation of his (humanity) relationship with the natural habitat that most likely from the side of society (at least in most of their existence) as a manifestation of the desire for self-affirmation through affirmation own "domination" over the rest of the natural reality, which must be realized through recognition obvious (again, in the opinion of the person) own "superiority".

As a determinant of this process factor, its actual "accelerator" appeared the adaptation processes accompanying the above-mentioned process and not always, however, leading to positive point of view of society) results.

And in the end, at the present time, humanity is its impressive (reached "threatening" sizes) growth rose real threat of the onset of an ecological Apocalypse capable of destroy all life at the planetary level as an actual, inevitable "perspective" on the horizon of social development.

A similar state of affairs, established in the sphere of relations between the two main elements of a global environmental the name "society - the natural environment" more carefully and in more detail to analyze their own perspectives of existence, to develop, with their subsequent practical application, certain steps towards the alignment of the existing "roll" in them.

Summary. The article is based on dynamics of socio - ecological behavior. The main aim is to research some features of dynamics of socio - ecological behavior.

The author analyzes phenomena and events in globally, social revaluation, concrete structure of socio-genes, system and character of social devices, the features of ecological ethics, essence of existed or formed ecological interrelationship.

The importance of the application: could be used in seminars and lectures in higher education institutions and at schools.

Key words: social, ecological, behavior, interrelationship, anthropogenesis, socio-genesis

Species Richness of Ground Beetles (Coleoptera, Carabidae) in the Polissky Nature Reserve

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Aim of the study: The territory of Ukraine where forests occupy only 17.6% is the least wooded among European countries. In addition, the forests, with the exception of the Carpathians, are fragmented. In Ukraine, most forests, including protected ones, have an artificial origin, and their age is often less than 100 years. The task of obtaining up-to-date information on the fauna of young forests, their ability to maintain an adequate level of diversity and to represent the type of natural ecosystems is relevant. The aim of the research was to study the diversity of the ground beetles (Coleoptera: Carabidae) and their distribution among different habitats on the territory of the Polissky Nature Reserve.

Material and methods: The research was conducted in the Polissky Nature Reserve in 2011-2012 and 2014-2017. The material was collected from pitfall traps. In total have been processed 10290 traps-days. The research covered the habitats of this Reserve: pine forests, pine-birch forests with blueberries, green mossy pine forests, lichen pine forests, deciduous forests and floodplain meadows. The deciduous forests and meadows were studied along the banks of the Bolotnitsa River.

Results: In total, 64 species of ground beetles were identified in Polissky Nature Reserve (PNR). Forty-seven identified species were from forests. The following genera were rich in species in the PNR: *Amara* (17 species), *Harpalus* (12 species), *Pterostichus* (9) and *Carabus* (8). The most numerous species in the forests of PNR were *Pterostichus niger*, *Calathus micropterus*, *Pterostichus melanarius* and *Carabus arvensis* which accounted 54% of the total catch. The highest value of Shannon's diversity index (2.7) was observed in the meadows, the lowest value (2.0) – in deciduous forest. Shannon's index in the coniferous and mixed forests was close in value: 2.4 and 2.3 respectively. The highest number of species (41) was found in meadows and the lowest (27) in the deciduous forest which is consistent with the estimate by index. Considering the fact that in the Polissya zone the diversity of ground beetles is not less than 230 species, the results of the research allow us to conclude that the main factor determining of the diversity is not protection of the territories but their naturality. Although the young planted forests of the Polissky Reserve have a depleted and banalic beetle fauna but in the recent years, such rare species as *Carabus menetriesi* and *Agonum munsteri* to begin to appear. The further observations of changes in the diversity of these insects in the aging forests of the Reserve will be give important information about the potential of such territories with regard to the restoration of natural ecosystems.

Acknowledgements: We thank Mr Bumar G.Y. for advisory assistance in selecting the accounting areas and in preparation of their descriptions.

Keywords: Carabidae, richness, forest, Polissky Nature Reserve**.**

Spread and Developmental Dynamics of Cypress *Carulaspis Caruelii* Bouch. in the Absheron Dendroflora

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Aim of the research: Selection of trees tolerant to domestic soil and climatic conditions and the study of their bioecological properties are the actual issues in the protection of ecological balance in the Absheron peninsula. Species of the *Cupressaceae* subfamily belonging to gymnospermsare very important in gardening and environmental protection.Thus, protection of these plants, cultivated in populated localities, from harmful organisms is one of the significan problems. Protection of the population health along with plant protection from pests is important in such areas. Therefore, the research was performed oncypress (*Cupresus* L.) species in the territory of the institute of Dendrology of ANAS.

Materials and methods: Monitoring and observations were performed in the territory for checking phytosanitary conditions. Pathogenic microorganisms and insects causing diseases were found to spread in young and old cypress species. Collected materials, diseased or damaged plant organs were examined in the laboratory and classified. Various methods were applied for the evaluation of the degree of infestation in the Absheron peninsula, depending on the species of the pest and nature of the damage.Infested model plants were labeled, the pest number was counted on $10cm^3$ of twig-brunch and leaf area during various periods of vegetation. Depending on the size of the field, 5-10 sample plants were taken staggered or diagonally.The evaluation was carried out on a five-point scale. 0 point- the pest is absent, 1 point-the pest rarely occurs on leaf, branch andtrunk; 2 points- the pest covers 25% of the surface of leaf and branches, 3 points - the pest covers 50% of the surface of leaf, brunch and fruit; 4 points -the pest completely covers the plant surface.

Results:*Carulaspis caruelii Bouch.* was detected in cypress species cultivated in the territory of the institute of Dendrology. Species of *Coccinea* subordoare characterized of pronounced sexual *demorphism*. Mature males have a pair of wings with reduced veins. Females have no wings and they are motionless. The asymmetric body is not segmented. Oral sucking apparatus and ovaries are developed well. Species of *Carulaspis Mac G.* genus spread in various gymnosperms. Cypress plants aremore infestedby *C.Caruelii Targ*compared with plants such as juniper. It occurs mainly on scale leaves and cones.Sizes of female insects vary depending on the plant they inhabit. Cypress plants infested with this pest dry. It reproduces 2 times per year. Inseminatedfemales are dirty yellow and they hibernate. It begins to lay eggs in May and 12-21 ova are in an egg.

The percentage of the pest spread on the plant, its density and effects have been studied. The plants were more affected by the pest during the larva formation period. The average density of the pest spread on 100 plant samples was estimated in the field and calculated by the corresponding formula.Most cypressspecies in the territory were found to be infested with this pest.Various methods were applied for the evaluation of the degree of infestation in the Absheron peninsula, depending on the species of the pest and nature of the damage.The degree of the infestation was 2.0-2.5 points.

Keywords*: Cypressus,* pest*, Carulaspis caruelii Bouch.*, development, spread

Steppe Plant of Korchay State Nature Reserve

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Aim of the research: The main purpose of the Korchay State Nature Reserve is to develop the scientific basis of the preservation, reproduction and rational use of plant and animal species, which are in danger of rare and endangered natural landscape of Bozdag.The vegetation is mostly found in vertical zonality law, but also occurs in intrazonal, extraonal and azonal plant species. In the territory of the reserve there are wormwood-grain dry steppes, wormwood-dry steppes, wormwood, wormwood-ephemer semi-deserts, wormwood-saline deserts,xerophyte steppes,derivative and cultivated plants which replaces the plant.Ephemers play an important role in vegetation.

Material and methods: Route and stationary methods were used in research.At the same time, floristic, floristic-systematic, areological, botanical-geographical, phytosanogenic and statistical methods used in Botanica are taken into account.The structure of the plant, its composition,number of the species, deficiencies and dominants in other words, the fluorescence and geobotanical characteristics of the plants were studied and flora richness was measured by the Drude 5th table.

In the classification of plants, V.J. Hajiyev [170,172], E.A. Gurbanov [187], M. Kochi M.Chytry, L.Tichi [365], V.I. Vasilevitch [158] and International Phytocenology Code were taken into account.

Steppes played a special role in the vegetation cover of Korchay preserve. However, due to poor use of land,cultivation under agricultural crops, inefficient use of pastures and herbage, many stagnant phytocenoses have shortened their range and some were endangered.Many of them have lost their zones and have monodominant senozes in smaller areas.Stipetum sp., Botriochloetum ischaemum and others. As a result of the influence of the anthropogenic factors, stalactites have shortened their range.In general, ¼ of the steppes in the Republic have radically transformed.

Results: Various types of wormwood (Artemisia fraqransea, A.absinthium, A.caucasica, A.marschalliana, A.dracunculus), (Phalaroides arundinacea), (Agropyron desertorum),(Bromus Japanese), (Axnaterum bromoides),(Aegilops cylindrica), (Echinaria capitata) spread.Steppe phytocenosis is cultivated under agricultural crops, especially in the area around Kurchayi and in the part of the Goranboy district of the valley. Their tracks only cover local areas. In all formations, the dominant hawthorn forms forms formed by various variants.In the early spring and autumn,they form coatings with grains and other ephemers at the expense of precipitation.Half steppes or dry steppes - when they reach the foothills of the area, the types of plants change each other.Firstly, the smaller dry areas and then on some tall slopes, are characterized by poor soil conditions, poor climate with strong temperatures, gravel and vegetation and then the environment of mountain-kserophyte bush, with some drought and thorns in the environment.These changes are not the same on each slope, height, valleys and hills.

In some areas, bushes are replaced by tall grasses, but the species retains its own xerophytic or arid state. In these areas, various juniper bushs form kserofit bushy groups.

Keywords: steppe, xerophyte, arid, ephimer

Structure of Fish Fry Communities in the Dniester Reservoir in 2017

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Aim of the study: The study of fish fry community structure makes it possible to evaluate both the modern species composition of the ichthyocomplex of the water body and the spawning efficiency of each fish species in the current year. A moratorium on commercial fishing has been introduced on the Dniester Reservoir, and fishing for scientific purposes has not been carried out for a significant time period too. Therefore, studying the structure of fry communities is one of the main sources of information about the state of the ichthyofauna in this hydroecosystem. Accordingly, it was the aim of our study.

Material and methods: The research was carried out in the upper (the aquatories of the villages of Prygorodok and Anadoly), the middle (aquatory of Makarivka village) and the lower (aquatories of Neporotove village and the city of Novodnistrovsk) parts of the Dniester reservoir in August 2017. The fry were caught with a 10-meter-long fry seine. All catches were fixed with 4% formaldehyde solution. Subsequently, the species of the fry, their total length and body weight were determined. The density of fry was expressed on 100 m^2 of shallow water area.

Results: 12 species of fish were found in catches of fry seine. There are *Abramis brama* (Linnaeus, 1758), *Alburnus alburnus* (Linnaeus, 1758), *Carassius gibelio* (Bloch, 1782), *Leuciscus leuciscus* (Linnaeus, 1758), *Rutilus rutilus* (Linnaeus, 1758), *Scardinius erythrophthalmus* (Linnaeus, 1758), *Gymnocephalus cernua* (Linnaeus, 1758), *Perca fluviatilis* Linnaeus, 1758, *Babka gymnotrachelus* (Kessler, 1857), *Neogobius fluviatilis* (Pallas, 1814), *Neogobius melanostomus* (Pallas, 1814), *Ponticola kessleri* (Gűnther, 1861). The density of fry communities ranged from 50 specimens per 100 m^2 in the upper part of the reservoir to 220 in the lower part. On average, the density of fry community was 112 specimens per 100 m^2 in the reservoir. Bleak occupies a dominant position in the upper part of the reservoir, its share exceeds 90%. In addition, fry of rheophilic fish species penetrate to the upper part of the reservoir from the river, for example, Common dace fry are recorded in the water near Prygorodok. Roach is the dominant species in the middle and lower part of the reservoir, the proportion of this species reaches 82%. The shares of other phytophilic fish such as Bream and Rudd are also significantly increased in these parts of the reservoir. Perch is evenly distributed throughout the aquatory of the reservoir.

Acknowledgements: The research was carried out with the financial support of the Ministry of Education and Science of Ukraine.

Keywords: fish species, fry, the Dniester Reservoir.

Study of Different of Imported Onion Varieties

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Aim of the study: In the thesis were described usage, benefits, collection and studying of different introduced onion (*Allium Cepa* L.) species. In practice studied phenological, biometric and morphological characteristics and analyzes (vitamin C, dry matter, nitrate, sugar) imported bulb onion variety accessions.

Material and methods: There were total 32 variety accessions studied. 32 sortname and country of origin: Turkey (Barakat, Mor Soghan, Beyaz soghan, Tekirdagh soghan, Casta, Beta Panko, Red Amposta, Betaki, Panko, Metan, Erkenci, Valenciana); Uzbekistan (Karatalskiy); Tajikistan (Peshpazak, Ispanskiy mestnıy, Mayskiy, Hissor); Ukraine (Khalchedon); America (Walla walla, Gırmızı bash soghan, Primero); The Netherlands (Red Baron, Shalot, Stardast, Rocardo); Spain (Sweet spanish yellow, Ispanyol beyaz soghan, Delfos); İtaly (Sarı Parma soghan, Lilia); Great Britain (Brown Pickling); India (Poona Red). Onion variety accessions for experiments have been collected from the imported each bulb variety accessions from different countries.

Results: Immediately after seed sowing, the so – called organic soil regulator called Lifos Leonardit was mixed with water and applied to the soil. The amount of fertilizer mentioned was 2.5 kg and the same fertilizer was mixed with 55 liters of water to this amount.

As it is seen from the table of economic indicators, the Beyaz soghan of Turkish origin (fresh - 4,500-3,900 kg, dry - 3,700 kg) and Delphos of Spanish origin (fresh 4,500-3,600 kg, dry - 3,500kg) have a larger weight. The lowest weight is Primero of American origin (age-0,500-0,450 kg, dry-0,400gr).

As can be seen in the productivity table, average yields of Metan (770sen / ha) and Beyaz Soghan (616sen / ha) varieties of Turkish origin dominate over other varieties. Low productivity was in Primero variety of American origin (100 y/ ha).

According to the definition of farming and productivity, Turkish origin species are predominant.

From the economic efficiency of productivity, the main bulb onion varieties of Turkish origin are more suitable for extensive cultivation in the soil-climatic conditions of Absheron.

Keywords: bulb onion, phenological observation, biometrical parameters, morphological signs, economic indicators.

Study the Biological Diversity of Natural and Therapeutic Plants Spreading to Natural Conditions in the Lankaran-Astara Region and Their Introduction in Cultural Conditions

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Aim of the study: Investigating the biodiversity of nutrients and therapeutic plants in the Lankaran-Astara region, exploring the gene pool and exploring the cultural conditions. Some of the rocks that are often exposed to natural conditions, biochemical properties, nutritional value, and therapeutic significance, include some of the rocks *(Ribes L.), blueberry (Vaccinium myrtillus), Caucasian rhombus (Diospyros lotus L.), vaccinium vitis-idaea L. and the cultivation (Crataegus L.)* biodiversity has been studied and cultivated habits.

Material and methods: Traditional and modern gene protection methods are used. Generally, gene pooling is based on collecting various collections, creating a seed bank (ex situ), and protecting on-site reserves. In the modern era, collecting genetic bank collections basically is three ways: basic (primary), active, double. The primary (primary) collection, long-term protection (long-term conservation) and its interaction are relatively limited. In active collections, the medium-term storage can be cut for healing, multiplication and sampling (medium-term conservation).Duplex collections are separated from the primary (primary) collection to provide reliable protection.
During the collection of samples, the regions where the population was densely populated were preferred for local climatic conditions and the seasonal transfer season (summer, summer, autumn) was detected.
Environmental factors such as temperature, light density, soil chemical composition, moisture balance, annual rainfall and other factors are evaluated in accordance with the natural conditions in which the samples are collected for the protection of listed species.

The new conditions have been studied in intravenous plants.
- Plant tolerance limits;
- Adaptable features (light, temperature, soil moisture, air, etc.);
- Genetic features of plants;
- Biological properties of plants in new conditions;
- Biochemical analysis of important vegetable fruits and vegetables;
- determine agro technical treatment rules for plants exposed to cultural conditions;
- The distance between rows and plants in the fields should be transferred to the sowing material.
- The method of soil preparation - rubbing, drilling, softening;
- Planting times - spring, autumn;
- Fertilizer application conditions: fertilization types: organic (fertilizer, poultry, peat, decay) and minerals (nitrogen (N), phosphorus (P), potassium (K), ash, micro elements boron, manganese, copper, molybdenum, cobalt, zinc).

Resuls: Genetically conserved and sustainable use is transmitted by nutrients and therapeutic plants that are at risk of reducing the number of species in natural conditions.

Keywords: biodiversity, genofund, introduction, species, soil, Caucasian persimmon

Studying the Absorption (of Chlorine), Respiratory and Restorative Activity of Plant Root System Under Potassium Cyanide Stress

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Oxygen and chlorine ions absorption and restorative activity of root system of plants – wheat, barley and cotton, which differ for salt resistance, under the action of the fourth segment of the respiratory chain of the potassium cyanide mitochondrial inhibitor, were studied. The salt resistance of these plants are as follows:

cotton > barley > wheat

The penetration of chlorine ions into the root system of 5-day seedlings at 100 mM NaCl is characterized by two different kinetic components.

The first component is due to passive diffusion and reflects the accumulation of Cl^- in the “free zone”, whereas the second component is of metabolic character and corresponds to the accumulation of Cl^- in cytoplasm and vacuole.

Under the influence of potassium cyanide at 1mM, the absorption of chlorine ions by plant roots is not fully inhibited and it is 30 to 40 percent below than in control. At the same time, the life time of the first and second components of chlorine ion transporters to the root system of plants decreases by 3-5 percent and 20-25 percent. The volume of root apoplast for chlorine decreases slightly.

The influence of potassium cyanide on plant roots dramatically inhibits oxygen absorption – to approximately 40 percent below control.

Experiments show that under KCN stress the restorative activity of the root system of seedlings increases significantly.

Thus, under the influence of KCN, a number of components, including terminal oxidation, cytochrome oxidase and other metal-containing enzymes are restored.

It became obvious that the oxygen and chlorine absorption speed, and the restorative activity of the root system have inverse correlation with respect to salt resistance.

Key words: plant root system, stress, chlorine.

The Addition Sunflower Oil to Male Lambs Feed and Its Effect to Their Concentration of Fatty Acids in Arterial Blood and Liver's Door Vein

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Aim of the study: Various oil-fat supplements are used to raise productivity in animal husbandry.However, these additives must satisfy the animal's energy needs, should be harmless and should not negatively affect the quality of the products of animal husbandry.That's why most researchers have recently been advised to give more vegetable oils to the chewing animals.Because most vegetable oils are rich in unsaturated fatty acids and have a positive effect on the productivity of animals.

Taking all this into consideration, we aimed to study intensiveness of fatty acids in the liver's door vein with the addition of sunflower oil to the feeding of male lambs.

Materal and methods: We performed a complex catheterization operation in 9 male sheep.For this purpose, each of the lambs carrying out a surgical operation and we have implanted chronic catheters to their sleeping artery,the liver's door vein and behind vein.Thus, we have been able to obtain information about how the intestines can be swallowed by the concentration of metabolites in the liver's vein of the artery and liver.Practical animals were given three different fodder shares by Latin squares method.In the group I feed was made of grass, cotton and barley. The level of fat in this feed was 3%. By adding sunflower oil to the feed additive in the second and third groups, we increased the amount of lipids in the feed to 5 and 7% respectively for the dry substance.

Results: By studying the concentration of fatty acids in arterial blood and door vein of the liver, we also detected the A-V difference.These indicators for individual groups were analyzed after statistical analysis. In the arterial blood of group I, II and III animals, the amount of concentration of separate fatty acids in the blood taken from door vein of the liver was studied and the A-V difference was calculated.

The highest indicator of saturated acids in arterial blood is in Group I (78.22). In the II and III groups, this acid decreased by 9.7% and 13.73%. As for the unsaturated acidic ratios, the highest indicator of unsaturated acids in group I (125.23) has been identified in animals. In the II and III groups, decreased by 18.8% and 19.61%. When we look at the amount of saturated acids in door vein of the liver, we see that the highest indicator is in group III (77.19). In group I and II, 8.36% and 17.57% decline was observed. In unsaturated acids the highest indicator was observed in group III (113.29). In the I and II groups decreased by 0.17% and 10.39%.

When discussing different fatty acids in groups according to the difference in arterial-vena, we can see that in group I negative indications were observed in C14, C14, C15 and C18: 3 acids.

In group II, the negative indications appear to C14, C14, C15, C16, C17 and C18: 1.

In Group III animals, adverse effects on C14, C16, C17, C18: 0, C18: 1, C18: 2 and C18: 3 acids were observed.

Our research suggests that the addition of 7% sunflower oil to the feedstuffs of the lambs leads to the transport of more saturated fatty acids 5 hours after the feed to the liver's door vein.

Key words: fat, liver, artery, blood, lamb, venous, unsaturated fatty acids.

The Deer of the Caucasus - *C.elaphus* L.

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Aim of the study: The C.e. deer ogilby (Caspian Reale) subspecies live in the Caucasus, Northern Iran and Kopetdag.Presently, the deer spread range covers North Africa, Europe (except the British islands), the Caucasus, the Small and Central Asia, the Far East, the Southern and Eastern Siberia and the mild zone of North America.Historically, it likely lived in the forests of Shamakhi in the territory of Azerbaijan. Later these forests were destroyed and its territory crossed to the mountainous forests of the Small Caucasus and Talish along Kur and Araz. The last animal was shot in 1922 in nearTalish - Astara.60 years ago it disappeared in west of the Nagorno-Karabakh forests.

Materal and methods: Medium sized animals are rarely in extreme cases. The length of the body from the tip of its face to the tip of the tail is 185 to 215 cm in men. Females are smaller and their lively weight is 20-25% less. His head is narrow, his face is tightened.His nose is flat, his ears are long.In older men, the horns are not usually less than 5 . The length of the tail (5-16 cm) is typically the tail is shorter than his ears.Nails have oval shaped, curved outer edge.In the winter, the hairs cover is rough, gentle and curly.Color is varies considerably from sand to gray-brown tin to intensive brown. There are never stains on the face, shoulders and neck.The tail mirror is large and covers the right side of the tail.

In the summer and summer, marals go up to the altitude of 2200 to 2500 m above the mountains and to the alpine meadows.In the winter they descend down to the upper and middle parts of the forest.The main wintering areas are the lower and middle mountain ranges of the forest belt (up to 1200-1400 m), as well as alpine slopes open for winds (Mount Kuton). The size and composition of the herds varies depending on the chapters.Larger (25- 30 heads) herds are observed during summer and spring. In some cases, it is possible to find female herds together with youngers.The deer live in small groups in most of the year.The pregnant animals are separated from the herd on the eve of birth and do not interfere with other groups until the infants rise. Men are often left alone, leaving the female pair after the pairing ends.

Pairing continues from late September to late October.Pregnant period lasts up to 280 days.Little deer are born in early of June. Some females are 2 years old, and males reach puberty at 4-5 years.Due to the pairing of deer, the deer make noise very long and lasts 59-75 days.A few minutes before the morning begins to make noise and then calms down at 8-9 am and the evening starts at 16-17 again and continues until the evening.During the pairing, men make almost all day sound, only in the daytime they stops noising for a short time.During this period, the activity of animals affects meteorological factors, as well as their physiological status, density and sex ratio.Meanwhile, deer go to the forest and alpine meadows at that time.

Results: According to our information, the nutrition of the deer is more colorful in spring, summer and autumn.Among the nutrition they eat plants, herbs constitute 70%, herbaceous plants, about 20% of the tree-bushes and the remaining 10% are other plant groups.At present, spreading of the deer area covers the southern slopes of the Greater Caucasus, Altyagac forest. According to our information, they are currently concentrated in Zagatala (about 800), Ismayilli (200), Ilisu and Shaki Reserves(80-90).

It is rarely found in the Small Caucasus, in the Karayazı and Lake preserves.Prohibition of hunting and protection of deer can help stabilize and increase their number.

Key words: deer, female, male, Caucasian

The dependency on leaf of biological indicators of silkworm breeds which have introduced of feeding in the silk

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Aim of the study: Silk is famous as the most prominent, economically profitable sector as an old type of employment in Azerbaijan.It is one of the most important things to get more quality mulberry, grena and raw silk products with a relatively small using amount of leaf in silk.

Material and methods: There were 16 varieties silkworm breeds and 4 repeats (4th reserve) experimental samples had been carried out using of leaves of local mulberry varieties in feeding introduced silkworm breeds in Azerbaijan Science Technology of Silk in 2012-2014.According to the feed norm for the silkworm breeds, each of them had been given 26 gr leaves (86% of the feed) at the age of five.The regulated leaf had been given to the silkworms by addition, which were fast or late get out for wrapping mulberry. For this reason, there is a difference in leaf consumption among different variants.The same conditions were created for all varieties and each option was separately analyzed in practice feeding to identify what kind of feeding can give much more product of breed, grena and silk.

Results: Based on the results of our three-years research, 3,403 kg had been observed in the feeding of leaves of AzNIIS-7 silkworm breeders which created by academics of the Ukraine-1 introduced silkworm breeders to 150 silkworms.At least feed was recorded in 3,287 kg varieties of the introduced Chinese-29 silkworm breed with the leaves of the local Khanlar-mulberry.The 3,353 kg of leaf was used of Chinar silkworm breed which was taken as control in the variant which has been feeding of Yunis-mulberry. For the purpose of the study, the average values for silkworm breeds,mulberry varieties were calculated and the difference level was determined.The result is that more feeds on breeders of Ukraine-1 silkworm breeders - 3,392 kg and more varieties of AzNIIS-7 varieties (3,374 kg) were used.These indicators are dependent on silkworm breeds and depending on the quality of the fodder of mulberry leaves.

In practice options, the least eaten leaf is the Chinese-29 silkworm breed which had beed fed of the leaves of AzNIIS-7 leaves of mulberry variates- 2,383 kg and the most eaten leaf is the leaves of Ukraine-1 silkworm breed which had been fed of the Baxcha-mulberry sort -2,632 kg was recorded.

Keywords: Mulberry, grena, sericulture, pedigree, leaf

The Diversity of Micromammals in Steppe Habitats with Varying Intensity of Anthropic Pressure

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Aim of the study: Ukraine has obligations to the EU to significantly increase the area of natural reserves, ensuring the representation of the entire diversity of landscapes in each of the geographical zones, therefore the task of finding representative territories is extremely relevant. Today, steppe areas in the south of Ukraine have been turned into farmland, and the remains of the steppe biocenosis are localized in refugia, most often gullies that are not suitable for plowing. The best indicators of the degree of intactness of the territory are settled organisms, such as micromammals among vertebrates. We studied the distribution of micromammals in the territory of the regional landscape park "Tiligulsky" by habitats with varying degrees of anthropic pressure.

Material and methods: The territory of the Tiligulsky Park represents the steppe biocenosis of the south of Ukraine, in which the valleys of steppe rivers and ravines are also represented. Most of the plain adjacent to the park is still used today as agricultural land, part of the ravines and the valley of the river Tsarega is used for grazing. Studies were conducted in the Regional Landscape Park Tiligulsky, whose territory is represented by ravines with steppe vegetation, the valley of the Tsarega River, and the plain interfluves – by cultivated fields. We zoned territory of the Park depending on the intensity of human use and the degree of attendance on a 5-point scale. Also on a 5-point scale, the territory was divided into sections, depending on the conservation of steppe vegetation. In the gradient described above, the distribution of micromammals was studied. On each site was placed on 21 traps. Caught animals were collected daily for 10 days.

Results: Nine species of micromammals were identified on the territory of the regional landscape park Tiligulsky. An analysis of the nature of their distribution over different habitats in the gradient of transformation by economic activity showed that the majority of species (8) are concentrated in intact ravines. Rare and protected species - *C. migratorius*, *S. subtilis*, *M. spiicelegus*, *M. rossiaemeridionalis* and *C. suaveolens* met only in refugia. *S. sylvaticus* и *S. uralensis*, показали более высокий уровень толерантности к антропическому пресу и встречались в балках с умеренным уровнем рекреации и выпаса. *S. sylvaticus* и *S. uralensis* showed a higher level of tolerance to the anthropic pressure and were found in gullies with a moderate level of recreation and grazing. As expected in the territory of the settlement and in its vicinity, only one species was registered – *M. musculus*. The results of the research showed that the reserves, in which most of the territory is used in economic activities, do not solve the problem of increasing biological diversity and preserving rare species. Endangered species survive only in refugia and do not spread to the rest of the park. As for the conservation of these species, the situation is not much different from unprotected areas. Thus, most of the park's territory does not participate in the conservation of endangered species.

Acknowledgements: The participants of the project are grateful to the administration of Tiligulsky Park and personally to its director Dr Dyrkach Oleg for the opportunity to conduct research on the park and material assistance in their implementation.

Keywords: step, micromammalia, biodiversity, Region Landscape Park “Tiligulsky”, Nature Reserve

The Diversity of Small Terrestrial Mammals in Polissky Nature Reserve

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Aim of the study: To investigate the diversity of small terrestrial mammals in Polissky Nature Reserve we carried out the inventory of mammalian fauna on its territory using different trapping techniques.

Material and methods: We used live-trapping (2008, 2011), pitfall trapping (2011-2012, 2014), analysis of owl pellets (1996-1997, 2006-2008, 2011, 2013) and also identified small mammals from osteological collection.

We used 15 lines of pitfall traps with salt solution for capturing insects established in different habitats (pine forests, pine- birch forests, grassland). Each transect contained 5-10 trap stations. In total we used 165 pitfall traps and caught 103 small mammals during 9080 trap-nights.

The diet of Tengmalm's Owl (*Aegolius funereus*) and Great Grey Owl (*Strix nebulosa*) from different localities was studied in the breeding and non breeding seasons. Altogether more than 276 prey items were analyzed.

Live-trapping was conducted in typical habitats (pine forests, birch-pine forests, bog, lake shore).

Results: The first survey of mammalian fauna in the reserve was carried out during 1987-1990 (Zenina, 1999). Seventeen small terrestrial mammals were recorded (*Sorex araneus, Sorex minutus, Neomys fodiens, Myoxus glis, Muscardinus avellanarius, Sicista betulina, Myodes glareolus, Arvicola amphibious, Microtus arvalis, Microtus levis, Microtus agrestis, Sylvaemus sylvaticus, Sylvaemus tauricus, Apodemus agrarius, Mus musculus, Micromys minutus, Rattus rattus).*

During our study we revealed all species listed in the mammal checklist and also added to this list one additional species (*Microtus oeconomus*). This species was found in pellets of *Strix nebulosa* among 12 prey items.

Due to pitfall trapping we caught 10 species of small mammals. In the collection among 15 species of small mammals 3 skulls of *Crocidura suaveolens* were revealed. This species also was absent in the checklist of Polissky Nature Reserve, but its representatives were likely captured in its vicinities.

Rare species *Sicista betulina* (listed in the Red Data Book of Ukraine and II Appendix of Bern Convention) was revealed due to analysis of owl pellets and also by means of pitfall and bar mouse traps.

In total on the territory of Polissky Nature Reserve 18 species of small mammals were recorded (representatives of families Talpidae, Soricidae, Muridae, Arvicolidae, Gliridae and Sminthidae) and one species was found in its vicinities. Due to pellet analysis 66,7 % of species composition was revealed, pitfall trapping and snap -trapping allowed to reveal 52,6 % and 78,9 % correspondingly.

Our study shows that the analysis of owl food remains could be recommended as standard technique for further long-term monitoring of small mammals. This technique could be used also in the course of investigation of rare species distribution on protected territories.

Keywords: small mammals inventory, Polissia, Ukraine

The Effect of Fetus of Some Biological Farm Features of New Type Bozakh Sheep Breeds Which Grown in Ganja-Qazakh Region

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Aim of the study: Today it is very important to raise meat, milk and high-quality raw material production using the existing sheep breeds in our Republic.Livestock development in Azerbaijan is of particular importance because of the high demand for animal products and the lower production levels.Therefore, scientific improvements in raising productivity of sheep breeds and their efficient selection are great biological importance.From this point of view, increasing the production of wide-ranging sheep-breeding,baby output, the time for fertilization as a factor affecting the increase of productivity of children update the subject of the research work.

Materail and methods: The development of theoretical basis of sheep breeding and its physical and laboratory methods of analysis were carried out on the basis of the 1990 methodology of the Russian Scientific Research Institute of Animal Husbandry.In the study, live body mass increase of the baby sheeps used in Bozax sheep, comparative study of months was performed on a standardized basis.Created and grouped indicators of product types as a result of high-level selection wool, dairy products, their physical, chemical and technological properties were determined according to the methodology.

Laboratory researches have been carried out at the " Laboratory of Livestock Products ” of the Azerbaijan Scientific-Research Institute of Livestock.The final results of the study were analyzed biometrical.

For the first time in the Bozakh sheep breeding in Ganja-Gazakh region, the time of passing out of baby sheep, their fertility indicators and scientific selection of subspecies (wool, meat, dairy) complex assessment was justified.

Results: Organization sheep pairing is in June-July in Ganja-Gazakh region and giving birth lambs continued till the end of first month of the winter season.It is economically profitable.While 110 heads of lambs were taken from 100 heads of sheep used for foster fetuses, 87 lambs were obtained from spring fertility, 4 of which were born dead. This means 90.20%. There was a difference in the live mass of mothers as they were born at different times. As it was mentioned, the average live weight of the sheep was 48.5 kilograms in November and 42.6 kilograms in January, ie 5.9 kilograms, in some cases even 9 kilograms.The reason is that the pregnant sheep are starving during the winter. So the sheep lose weight, and the embrio can not eat enough in the mother's womb. During the study, births of different seasons and months also affected animal wool productivity. Thus, the wool productivity of the male and female of the fetus was 3,0 and 2,8 kg respectively. In the summer sheep, these figures were 2,2 and 1,9 kg anologically.According to these figures, it is apparent that the wool productivity is economically effective compared to the summer fertility (36.36% for males and 33.3% for females).

Keywords*:* sheep, lamb, fetus, wool, meat, leather

The Importance of Living Collections of Tropical Plants in Ukraine

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Aim of the study: In this abstract we would like to discuss how M.M. Gryshko National Botanical Garden contributes to achieving target 8 of the Global Strategy for Plant Conservation (2010), suggesting that for 2020 at least 75% of threatened plant species will be presented in *ex situ* collections, preferably in the country of origin, and at least 20% will be available for recovery and restoration programs. Therefore, it was important to assess the taxonomic diversity of living plant collection of tropical plants, maintained at NBG focussing of the main plant groups which are of highest priority for *ex situ* conservation.

Material and methods: Living plant collections of tropical plants were replenished and managed taking into consideration the International priorities in the Garden's policy of collection development as outlined in the International Agenda for Botanic Garden in Plant conservation, Global Strategy for Plant Conservation (2010) and CITES Checklists**.** The NBG's collection of tropical orchids was registered at the Administrative Organ of CITES in Ukraine (Ministry of Environment, registration No. 6939/19/1-10, 23 June, 2004). The basic asymbiotic seed germination techniques and tissue culture procedures (including cryopreservation of orchid pollinia and seeds) for the propagation and long-term conservation of plants from various angiosperm families both in *in vitro* culture and under glasshouse conditions have been used. The field expeditions in tropical regions of the world (Vietnam, Madagascar, Costa-Rica, Reunion) were undertaken to assess the main threats to tropical plants and to prioritize the plant groups to be the main focus for an in-depth investigations aimed at long-time conservation under *ex situ* conditions.

Results: Founded in 1935, M.M. Gryshko Botanic Garden (NBG) is one of the top botanical research institutions in Ukraine. *Ex situ* conservation of tropical plants threatened with extinction within their native ranges is one of the highest priorities on research agenda at NBG. At present the NBG living collection of tropical plants comprises about 4200 taxa representing approximately 900 genera and 164 families, i.e. approximately 75% of all plant families maintained in NGB's living plant collections. The taxonomically richest families in collections are the following: *Orchidaceae, Cactaceae Apocynaceae, Araceae, Crassulaceae, Asparagaceae, Amaryllidaceae, Euphorbiaceae, Bromeliaceae, Moraceae.* The orchid plants have been a main focus of the Garden's Living Collections. The collection of aseptic cultures of tropical plants includes 170 taxa, in particular, endangered plant species*,* including 75 orchid species*.*

To summarize, living collections of tropical plants, accumulated at NBG could be considered as a global resource for *ex situ* conservation, while NBG remains on the national level the main institution involved in tropical plant conservation and reintroduction programs.

Keywords: living plant collections, *ex situ* conservation, Global Strategy for Plant Conservation, *in vitro* culture, glasshouse conditions.

The Introduction of Decorative Trees and Shrubs and Using them in Landscape Architecture

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Aim of the study: Our cultural dendrofloam has been enriched in recent years thanks to the new species of decorative trees and shrubs that have been imported from different countries of the world, as well as by the renowned botanists, used in greenery works in our Republic, new parks and gardens. In the Institute of Dendrology of ANAS, comprehensive scientific research is being carried out to introduce and classify new plant species and to study the bioecological features scientifically. The article gives information about some of the decorative trees and bushes that have been introduced.

Material and methods: Have been used *Diziggotheca elegantissima* R.Vig.et Guillé, *Schefflera octophylla* Harms, *Pachira insignis* Sw., *Howea foresteriana* Bucc., *Callistemon lanceolatus* DS, which was first presented as the object of the research.

Results: *Dizygotheca elegantissima* R.Vig.et Guill. (family *Araliaceae* Juss., on the genus *Dizygotheca* N.E.Br) . There are 17 species known in Colonia and Polynesia. A beautiful articulation is an evergreen tree that is not bent, gray, brown. Folded and longitudinal leaflets are mainly collected in the upper part of the body. The length of the stack reaches 30-40 cm, thicker than the base. In the upper part of the flowerbeds, small flowers are gathered in an umbrella flower group consisting of numerous flowers. The flowers are 5-membered. Rarely with pen, it is rarely replicated with seeds. *Schefflera octophylla* Harms. (family *Araliaceae* Juss., on the genus *Schefflera* J.R.Forst.). This species is found in 150 species of tropical countries. Eight-legged scaffolds are an evergreen tree with a long stem, turn finger leaves. The fibers 6-8, ellipsoil, 7-15 cm long, 2.5-5 cm long, have a short stalk (1-2 cm). White flowers were collected in a small, umbrella flower group. Rarely flourishes in cultural conditions. Repainted with penis pens. *Pachira insignis* Sw. (family *Malvaceae* Juss., on the genus *Pachira* Aubl.) *Pachira insignis* is a tree or shrub that spreads in tropical areas of South and Central America, Africa and India, in open areas, in dry rocky rocks. 77 types of sexes. The height of the homeland is 25-30 m. The leaves are in the form of a finger, the fruit consists of two layers of open layer, oval shaped, with a large number of seeds. Reproduced with seed. *Howea foresteriana* Bucc. (family *Areceae* Juss., on the genus *Howéa* Becc.) The name of the genus was taken from the Lord-Xay islands. It is a 12 m high vertical palm that is not drawn from the main body. The leaves are twisted, up to 2.5 m long. Leaf saplings are 1.5 m long. The flowerbed is branched, with a length of 1 m. Ends in the atmosphere and gives fruit. *Callistemon lanceolatus* DS. (family *Myrtaceae* Juss, on the genis *Callistemon* R.Br.) Western Australia is home to about 30 species. At an altitude of 3 m, it is evergreen. It has a flat shield, bare hull, and shingles. The leaves are chestnut, greenish-yellowish, 2-4 cm long, with a sharp edge of 0.3-0.4 cm. Flower reading is 5-10 cm long, red-colored floral flowers are packed in a dense floral group. It flourishes in May-June. The fruit is in the form of wine, it grows in the spring of next year.

The growth of these species during the vegetation period, the phases of the phenolic growth, the sustainability of climatic factors were studied. Given that Absheron is resistant to land-climatic conditions, it is advisable to use office space, parks and gardens for greening.

Keywords: denroflora Azerbaijan, introduction, species, propagate, family.

The Introduction of Bifora Species

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Aim of the study: The flora of Azerbaijan is rich in spicy, medicinal and nutritional plants. Gathering them from wild flora, studying their biological, morphological features and defining the changes that are taking place depending on the environment are interesting. In some plants, fatty oils have particular importance. The oils in them are both important in food ration and are used by people for different purposes (perfumes, cosmetics, preparation of medicines, etc.). For this purpose, types of *Bifora radians, B.testiculata* widely used as medicines, food, spicy plants were thoroughly studied and introduced to the practice area of the Institute of Dendrology of ANAS.

Material and methods: Seed supply of intruded species is made of wild flora. Seeds were initially stratified within 2 months. To do this, the seeds were soaked and planted in the ground. For comparison, it was planted in the ground for 5 times. The planting scheme is 60x60, the seeding depth is 5-7 cm, the distance between the sockets is 20-25 cm. 10-20 seeds were sown in each socket.

Results: *Bifora radians* – radian Coriander is a yearly, bare, monochorous plant. Its body is wrinkled. Its height is 10-40 cm. The leaves are featherlike double. The limbs are multiflowery on the edges. It is also rising at the upper part, as it is based on the fruit part. It ends up from the plains to the middle mountain ranges, in the plants, in the fields, in the gardens, and in the bushes.

Bifora testuculata – Small Coriander, height is up to 10-20 cm, is yearly plant. Petals are white. There is essential oil in seeds with 1.43%, 0.65% in flowers, 0.38% in underground part, on the body and leaves. That plant oil is light greenish, darker and stronger. Fresh leaves are used as spice in different meat dishes (soup, dovga, etc.). The phenolic development phases of the introduced species have been observed and registered (tab.).

Table

Fenological development phases of intruded species (2016-2017)

№	Names of plants in Latin	Time to sow	Sprouting		Bouncing	Flowering		Seeding		The drying of the
			Start	End		Start	End	Start	End	
1	*Bifora radians*	10.03	15.03	21.03	09.04	07.05	19.06	23.06	29.07	26.08
2	*B.testiculata*	10.03	17.03	25.03	13.05	22.04	22.05	17.05	19.06	29.08

The first seedlings were observed 5-10 days after sowing. In the first year of plant growth all stages of ontogenesis have been encountered. Generally, the initial generative organs of the plants introduced is observed after 57-137 days.

Based on the findings, it was found that the amount of essential oils derived from ordinary Fennel and Laserpitium seeds produced in ex-situ conditions is higher than others.

These species are widely used in the preparation of dishes such as vegetable and spices, essential oils derived from them are being used in medicine, in confectionery, in soap production and in the preparation of various drinks.

Keywords: Bifora radians, *B.testiculata*, introduction, fatty oils

The Phytosanological Research of the Beneficial Species of the Lamiaceae Family in the Flora of Azerbaijan

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Aim of the study: In Azerbaijan, the *Lameaceae* family has one of the most important places among the herbivorous, inflammatory and wild-vegetable crops. More than 70% of species included in the family are used by humans for their beneficial properties. Taking this into consideration, study of the beneficial species of the *Lamiaceae* family (*Origanum vulgare L., Thymus hyemalis Lange, Satureja macrantha C.A.Mey., Zizifora Seryllacea Bieb., Mentha longifolia* (L.) Huds) spred in the flora of Azerbaijan was set as a goal.

Material and methods:: The studied plant collected from the areas, the ontogenetic situation has been identified. Based on the results, the spectrum of the ontogenetic situation has been compiled and the efficacy degree of plants was studied [Zaugolnaya L.B. and others. 1988]. The following population indicators have been utilized as an integral characteristics of the plant's demographic structure: age index (□); Specific rate of population growth, recovery index, pregenerator individuals changed by (I_B) states the relation to total of pregenerators and generators. Aging index, effectiveness index(*ω)*, effective ecological density of the population (M_e) has been define. Finding the interval value of the parameters was carried out by the butstrep method. In addition, density of 1n (n+1), ∆, was used in order to evaluate the density of senopopulations and arcsin□p, p was used in order to evaluate the density of ∆, I_1 və I_2.

Comparison of vegetation's population parameters within Senopopulation was made in different years. Type of senopopulation has been defined using absolute maximum criterion classification andclassification of delta-omega-type normal senopopulations by L.A.Jivatovski.

Results: During the study, senopopulations were identified on 5 species of family. In these populations, senological condition, age (∆) and effectiveness (ω) indexes were evaluated. It was revealed that, in the g1, g2 and g3 phases of ontogenesis, estimates for all species are maximized. When studying their ontogenetic condition, 5 populations were selected for the *Thymus hyemalis* type in Ordubad and Shahbuz districts of the Nakhchivan AR. *Satureja macrantha* and *Mentha longifolia* were evaluated in 8 populations of the Guba massif of the Greater Caucasus. *Zizifora seryllacea* and *Origanum vulgare* species have been studied in 8 populations in Sheki region. The following age and effectiveness indices have been identified during determination of the demographic structure of plants, phytocenological characteristics and population structure: *Zizifora seryllacea* Bieb. *(*□=0,26-0,57; ω=0,33-0,56), *Satureja macrantha* C.A.Mey. *(*□=0,27-0,58; ω=0,22-0,77), *Mentha longifolia* (L.) Huds *(*□=0,43-0,71; ω=0,39-0,61), *Thymus hyemalis* Lange *(*□=0,23-0,24; ω=0,42-0,72), *Origanum vulgare* L. *(*□=0,52-0,58; ω=0,49-0,51). At the same time the plant restoration index ($İ_b$) is 0,23-1,56, and aging ($İ_q$) changed between 25,6-32,15. This also indicates the sustainability of the species.

Keywords: Population, phytocenology, Lamiaceae, aging, recovery

The Spatial Distribution of the Populations of *Viviparus Viviparus* and *Viviparus Contectus* in the River and the Lakes of Floodplain

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Aim of the study: The modern concept of conservation of biological diversity comes primarily from the idea of preserving habitats and not from the idea of protecting populations of organisms. But often the habitats is perceived very formally on the basis of only external features without thier taking into account the content. The presence of the river bed does not ensure presence of species diversity unconditionally. Without understanding the ecosystem of the river as a unity of the river bed and a system of floodplain reservoirs the preservation and protection of biological diversity in it is not possible. The distribution and diversity of the two *Viviparus* species in the river with disturbances of the hydrological regime were studied.

Material and methods: Two species of mollusks (*Viviparus viviparus* and *V. contectus*) in the Psel River (the Dnieper basin) and in the system of floodplain lakes were studied. The mollusks were collected using standard methods. A 60-kilometer section of the riverbed and 17 floodplain lakes were investigated. Samples were collected at 20 stations of the river and at 42 stations in floodplain lakes. The density of the settlements was calculated per m^2 of the bottom. In the bodies of water studied, the nature of bottom sediments was investigated, the depth of soft sediments was measured and the O_2 content was measured in the water column and on the surface of bottom sediments.

Results: Both species of mollusks – *V. viviparus* and *V. contectus* – in the Psel River and its floodplain lakes are common and numerous, which is consistent with literary data. Even after drainage of the floodplain, but with the retention of spring floods the populations of both species were present in the structure of fauna. In recent decades, there has been a significant reduction in the number of *Viviparus contectus* due to decline in river water and a lack of spills. At the same times the populations of *Viviparus viviparus* inhabiting the flowing and semi-flowing water remained numerous. We assume that *Viviparus contectus* is a species with a narrow ecological niche. The optimal conditions for *Viviparus contectus* is realized in lakes of the floodplain which are at a certain stage of ecological succession. In contrast to *Viviparus viviparus* the *Viviparus contectus* withstands low oxygen tension while remaining on the bottom of the lakes with silt. If the trend to regulate the hydrological regime of rivers and eliminate floodplain lakes is going to continue, this species is doomed to extinction.

Keywords: mollusk, river, lakes of floodplain, biodiversity, hydrobionts.

The Study of the Species Composition of Pests Affecting *Pittosporum tobira* Plants and Some Bioecological Properties

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Aim of the study:*Pittosporum tobira* L.species are known to be used for greening parks and gardens in the Absheron peninsula as decorative plants. These economically important, valuable plants are exposed to adverse effects of pests. Phenological observations were performed on the *Pittosporum tobira* L. species cultivated in the territory of the institute of Dendrology. Registration and assessment of pests on the various organs (branch, leaf, flower, etc.) of plants were conducted. The main pest in the *Pittosporum tobira*species cultivated in the territory of the institute of Dendrology was found to be long, white-coated *Chlorapulinaria floccifera* West.

Materials and methods: The research was conducted on the *Pittosporum tobira* L. species cultivated in the territory of the institute of Dendrology. Route observations were performed to establish species spread in these plants in 2017. Ten plants were taken staggered for each sample and visual observations were carried out. Leaves, branches and other plant parts infested with pests were collected and herbariums were prepared. Samples taken for the identification of pests were kept in formalin or 79% spiritsolution.These samples were examined using the lens and binoculars, and a relevant method was used for the determination of the species composition of the pests.According to the developmental phenogram of *Chlorapulinaria floccifera* West, this pest reproduces 2 times per year.Usually II and III age larvae hibernate. Pests become mature at the end of April and at the beginning of May and begin to lay eggs at the end of May.At the beginning of July larvae appear from the eggs laid at the I and II decades of June.The larvae are transformed into mature individuals starting from the 3rd decade of July after changing their sheath three times. This process continues till September. Laying eggs begins in September. At the end of September andat the beginning of October the second generation of larvae begins to emerge.

Results: As a result of the phenological observations performed on the *Pittosporum tobira*species cultivated in the territory of the institute of Dendrology, the main pest affecting this plant was found to be long, white-coated *Chlorapulinaria floccifera* West. This pest reproduces 2 times per year andI and II ages of the larvae are theoptimal period for the struggle with it.Biological effectiveness was 75-80% after applying 0.2% biological preparation- Lepidosid (100 milliard spores).The research showed that7-spotted *Coccinellidae* bugs play an important role in destroying the eggs and larvae of the pest.

Keywords*: Pittosporum,* pest, development, larva, struggle, lepidosid

Treatment Animals in Azerbaijan Based on Ethnic Methods

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Aim of the study: Medical plants cause the creation of immunity-biological buffer against patogen micro-flora as well as increases the general resistance of the body and stimulates immunity-protection strength of new borne, because plants can synthesize a lot of different chemical combinations. In the national science of medicine of Azerbaijan, the following plants were used to treat the stomach-intestine illness of young animals since ancient times: *Orchis mascula*, *Hypericum perforatum*, *Matricaria chamomilla*, *Sanguisorba officinalis*, *Potentilla erecta*, *Rumex confertusAchilla millefolium*, *Solidago vigaurea*. Taking into account this fact, our research is devoted to the superiority of the use of national medicine in the treatment of animals.

Materials and methods: The research was held by the Ethno-botany laboratory of the Institute of Botany of Azerbaijan National Academy of Sciences jointly with the Department of veterinary sciences and biology of Nakhichevan State University in 2017. The visits to the different botanical-geographical regions of Nakhichevan Autonomous Republic were done each year as well as ethno-botanical, flouristic and methodological expeditions were held. Besides, comprehensive survey was held on the ethnical use of the plants that we gathered especially in the villages and the comments were made. The experiments on animals were mainly implemented in the farms.
The survey among population was held according to Jotton J.M. (1996) methodology. The program on gathering national treatment information was used for compiling the questions. This program was compiled by Chursin G.F. in 1929.

Results: The research proved that local communities mainly use wild plants for the following goals: - better digestion (Menyanthes trifoliata, Gentiana schschistocalyx, Cnicus benedictus); - tart and against inflammation (Quercus castaneifolia, Cotinus coggygria, Sanguisorba officinalis, Polygonum bistorta. Filipendula ulmaria), - against skin parasites (Anabasis aphylla,Pyrethrum carneum,Veratrumlobelianum), - bee illness (Solanum nigrum, Hypericum perforatum, Calendula officinalis, Capsicum annum, Tanacetum vulgare, Thymus transcaucasicus), - avitaminosis illness (Urtica dioica, Rosa canina), - chilling (Clycyrrhiza gabra, Tussilago farfara, Plantago major).

Nomad herdsmen achieved great progress in the treatment of animals based on the medical characteristics of the plants. Winter pastures are rich vitaminous treatment plants against helminites. If eaten by house animals, it increases the ability for generation growth. The death of young animals is mainly related with the bad quality feeding which disturbs the exchange of components in the body.

Microbes (salmoneles, bacteriums etc) increase rapidly and harm it. Treatment plants don't influence the natural micro-flora of intestine, but, causes the increase to the beneficial milk-acid bacteriums. It increases the digestion and appropriation of nourishment components.

The treatment plants which have anti-microbe, tanning, mucous, and tart impact are successfully used in the treatment of stomach-intestine illness of calves. They dont cause disbacterium which is created by the use of antibiotics.

Key words: ethno-botany, treatment plants, veterinary sciences.

Using Bioregulators of Microbiological Origin under *In Vitro* Conditions to Obtain New Lines of Wheat with Increased Resistance to Plant Parasitic Nematodes

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Aim of the study: Plant parasitic nematodes are dangerous pests that damage various agricultural crops and decrease their productivity. The aim of our work was to obtain new lines of wheat (*Triticum aestivum* L.) plants with increased resistance to plant parasitic nematodes under *in vitro* conditions on the nutrient MS media containing bioregulators of microbiological origin.
Material and methods: Here we conducted the studies of the effect of nutrient media with bioregulators of microbiological origin (Avercom, Avercom nova-2, Phytovit and Violar) on the resistance to cereal cyst nematode *H. avenae* of wheat plants of cultivar Zimoyarka grown under *in vitro* conditions using phenological and molecular-genetic indices for wheat plants. We also studied the resistance to various species of nematodes of wheat plants obtained under *in vitro* conditions on MS media with bioregulators of microbiological origin and further grown under greenhouse conditions using morphometric and molecular-genetic indices for wheat plants.
Results: *In vitro* experiments showed that wheat plants grown on MS media with bioregulators of microbiological origin had 20-37 % of infestation with cereal cyst nematode *Heterodera avenae*, significantly lower when compared with 73 % of infestation of the control plants grown without bioregulators. Bioregulators of microbiological origin increased morphometric parameters of the wheat plants obtained under *in vitro* conditions on MS media and further grown under greenhouse conditions on the natural invasive background: stem height increased 13.6-37.5 %, flag leaf length 18.0-19.3 %, ear length 6.8-24.6 %, and ear weight 27.0-54.5 %, when compared with control wheat plants. The difference in the degree of hybridizated molecules mRNA and si/miRNA from control and experimental wheat plants increased: 15-39 % in plants grown under *in vitro* conditions on the invasive background created by *H. avenae* and 33-56 % in seeds of plants grown under greenhouse conditions on the natural invasive background. The silencing activity of si/miRNA from wheat plants grown on MS media with bioregulators of microbiological origin increased: 20-51 % in plants grown under *in vitro* conditions on the invasive background created by *H. avenae* or 38-64 % in plants grown under greenhouse conditions on the natural invasive background.
Conclusion. Our studies conducted under *in vitro* and greenhouse conditions confirmed the possibility of application of the bioregulators of microbiological origin on the nutrient MS media to obtain new lines of wheat (*Triticum aestivum* L.) plants with increased RNAi-mediated resistance to plant parasitic nematodes.
Acknowledgements: This work has been carried out with support of the project “Obtaining of cell lines of agricultural plants with increased resistance to pathogenic and parasitic organisms by the way of inducing of RNA-interference process using bioregulators of microbiological origin” of the complex interdisciplinary program of the scientific researches of the NAS of Ukraine “Molecular and cellular biotechnologies for medicine, industry and agriculture” for the 2015-2019 years (confirmed by the decision of Presidium of the National Academy of Sciences of Ukraine from 11.02.15, No. 22).
Keywords: wheat, resistance to parasitic nematodes, bioregulators of microbiological origin.

Using in Greening of *Eucalyptus L.*Herit. Species in the Conditions of Absheron

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Aim of the research. The prospects for introduced species of trees and shrubs in the new climatic conditions depend on their ability to survive, their resistance to environmental factors, their growth and development.

The particular importance in greening works is the choice of resistant species to soil and climatic conditions and their proper location.Using in gardening species of Eucalyptus are differ in the form and color of leaves and trunk, color of flowers and other decorative properties, with mixed planting with other tree species are giving an effective results.

Materials and methods. In the studies conducted in the Absheron Peninsula in ex situ conditions, it was determined an integral assessment of the prospects of eucalyptus species and the ability to survive. There are many methods for assessing the prospects of introduced plants. Datas about these plants under the new conditions are collected by the methods of P.I.Lapin and S.V.Sidnev and they are revealed prospects degree of these plants.

The species are divided into 6 prospective groups. For the introduced plant species, normal flowering, fruiting and insemination is one of the main tasks, therefore, when dividing, the highest exponent (20) was given to generative reproduction. Taking into account the stiffness of the shoots of the investigated during the vegetative period before the winter months, these indicators are estimated on a 20-point scale.

In this regard, of the six prospective groups in terms of the number of points, young and adult plants are divided into different groups. There is a difference in points of promise between adults and young plants. Young plants had few points in the same group.

All the year round, the species of eucalypts were estimated with a score of 3 points for preserving the decorative effect on a 5-point scale by B.F.Sukhikh. Decorative effect all the year round are estimated by 5 points, decorating during the whole vegetation period by 4 points, at certain times during the vegetation period they retain their decorative value by 3 points.

Results: With the use of decorative exotic species of eucalyptus, you can create very beautiful compositions in cities, towns, parks, gardens, around industrial centers, grouping them with other trees and shrubs in single or group plantings following the ordinance of landscape architecture.

According to their growth, eucalyptus species are identified to a group of high species (25-35 m). For these qualities, eucalyptus in planting are alternated with stunted trees and shrubs.

When creating decorative compositions from eucalyptus, one must take into account their stability, longevity, and they are given evaluation criteria for using them in specific areas. For this purpose are taking into account biological properties, their resistance to environmental factors, annual development, height and diameter of the crown of species belonging to the eucalyptus genus.

Keywords: *Eucalyptus L.*Herit., prospects, introduced species, ecological factor

Using Remote Sensing Methods in Bioindication of Urban Ecosystems

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Aim of the study: Solving actual environmental problems associated with the global decline in air quality, a significant increase of toxic emissions by industrial objects, enhancement loads from automobile transport requires continuous monitoring of environmental quality assessment. Plants are reliable bioindicators of ecological condition of natural and urban ecosystems. The aim of present study was to evaluate the state of technogenic pollution of Kyiv for the analysis of changes in the spectral reflectal characteristics of leaves of bioindicators - wide spread species *Taraxacum officinale* Wigg. and *Tilia cordata* Mill., which is widely used in planting of greenery of European cities.

Material and methods: The method of remote sensing is based on the measurement of the spectral reflection characteristics of leaves of bioindicator species. Spectral reflective characteristics more than 500 leaves of *T.cordata* and around 400 leaves of *T. officinale* collected in 2017 in 3 parks (Feofaniya, the park-monument of horticultural art, Pushkin park, and Mariinskyi park). Samples of leaves taken in locations (on different distances from the road with intensive traffic) were measured with a field portable spectrometer ASD "Field Spec - 3FR" (USA) with a working spectral range of 350 to 2500 nm. As the most informative indicator we have chosen the index of stress (reverse vegetation index), which characterize the state of the plant and determine the degree of inhibition of photosynthesis. The spectral reflection coefficients (SRC) of leaves were measured in green - R1 (550 nm), and near infrared – R2 (800 nm) range of spectrum. The measured coefficients of reflection in these spectral bands ranging from 0 to 1. The index of stress was defined on the base of measurements as: IS = R1 / R2.

Results: Number of ecologically clean areas and parks within the city and the adjacent territories, steadily decreases and they become more valuables. Anthropogenic contamination often leads to the death of plant communities. Another one consequence environmental contamination is a change of plant pigments, in turn, appears to change of spectral reflection peculiarities, that allow using it for bioindication. Registration and evaluation of these changes, which may be recorded at an early stage of degradation, give an authentic picture the plant growth location and reflect the actual state of the urban environment. Study of the spectral reflection characteristics of bioindicators *T.officinale* and *T. cordata* has shown a trend of increasing of the index of stress along a gradient of traffic. The use of this method makes it possible to record on optical measurements and study stages of plant reactions to the action of natural and anthropogenic stressors, to diagnose an adaptation phase, a phase of stability and phase of excited irreversible changes, each of which has its own physiological mechanisms of suppression and patterns of accumulation of pollutants. Bioindication of anthropogenic pollution of urban ecosystems for the spectral characteristics of leaves is a promising low-cost method (*in situ*) of environmental monitoring.

Acknowledgements: This work was performed with technical assistance of colleagues from Scientific Centre for Aerospace Research of the Earth, Institute of Geological Science, NAS of Ukraine.

Keywords: remote sensing, bioindication, urban ecosystem

Weevils (Coleoptera, Curculionoidea) of the Polessky Nature Reserve

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Aim of the study: Weevils of Zhytomyr Region have been studied for a long time. However, there are not many records of weevils from the Polessky Nature Reserve. The most complete checklist of weevils found here (47 species) is given in (Nadvorny, 1996). Findings of two new species in the reserve were published by N.V. Nazarov and P.N. Sheshurak (2009). Weevils were collected manually and using sweep-netting. Systematic studies of weevils using pitfall traps have not been conducted before (Nazarenko, Kobzar, 2014). The aim of our work is to reveal abundance and distribution of weevil species in the reserve.

Material and methods: In 2011-2012 and 2014-2017 terrestrial invertebrates were collected in Polessky reserve using pitfall traps located on permanent monitoring sites. The sites were chosen mainly by the type of vegetation. 21 trap-lines were created in the common reserve habitats (pine and pine-and-birch forests, meadows, heather thickets, bogs) and in rare habitats (meadows, deciduous forests). A few weevils (Coleoptera, Curculionoidea) were found in pitfall traps. The choice of sites and primary processing were performed by L.I. Kobzar. Collected material and descriptions of sampling sites were sent to experts from the Schmalhausen Institute of Zoology National Academy of Sciences of Ukraine (V.Yu. Nazarenko in particular) for further analysis. In 2011-2012 V.Yu. Nazarenko conducted his own investigations on the territory of Selezovskyi and Kopyschanskyi forestries in the vicinity of Selezivka village using individual observing and sweeping trees, bushes and herbaceous plants, and soil surface as well as sifting various substrates (leaf litter, plant debris, damaged wood etc.).

Results: 33 weevil species were found in reserve, most of them (29) for the first time. Higher species diversity was observed in floodplains, glades and forest outskirts. Most abundant species were *Nanophyes marmoratus* (Goeze, 1777) (Nanophyidae), *Hylobius abietis* (Linnaeus, 1758), *Strophosoma capitatum* (De Geer, 1775) (Curculionidae), *Micrelus ericae* (Gyllenhal, 1813) etc. Notable faunistic finds are *Notaris aethiops* (Fabricius, 1793) (Erirhinidae) and *Mecinus heydeni* Wencker, 1866 (Curculionidae).

The numbers of weevils fallen in pitfall were low representing only certain species range. Using this method 14 Curculionoidea species from 13 genera from three families (Apionidae, Dryophthoridae and Curculionidae) were found. Seven species of them are recorded from reserve for the first time (Nazarenko, Kobzar, 2014). Weevils were <5% not only of all invertebrates but of coleopterans collected by pitfall traps. In 2012 they were 2.47% of all Coleoptera in pitfall traps. *Otiorhynchus ovatus* (Linnaeus, 1758) and *S. capitatum* occurred in pitfall traps constantly in relatively large amounts.

Acknowledgements: We are grateful to G.Y. Bumar for help with selection and descriptions of monitoring sites.

Keywords: Curculionoidea, Coleoptera, weevils, fauna, protected areas

Effect of a Drought on Traits Characterized Photosynthesis in Differ on Maturing Durum and Bread Wheat Genotypes

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Aim of the study: Based on various morphological and physiological observations on typical wheat samples studied in accordance with different soil - climatic conditions of the country, taking into account the resistance to a drought and diseases, determination of a drought resistance aspect and effect on productivity at physiological measurements.

Material and methods: In order to increase the tolerance of plants to stress factors and is primarily clarification of the mechanisms of tolerance, to identify physiological and genetic changes that occur in plants should be given priority to the physiological investigations. Investigation were conducted at Absheron, Gobustan and Jalilabad Regional Experimental Stations of RI of Crop Husbandry, on wheat genotypes. At the same time in connection with the different maturity, variety samples were identified in early, mid and late mature groups.

In order to investigate the role of photosynthesis in productivity, photosynthesis intensity on different level of leaves was measured in each of the wheat genotypes investigated in different periods of vegetation. The photosynthesis intensity on the upper level leaves, intensity of transpiration, concentration of carbon dioxide in the intercellular area, and stomata admittance are determined by LI-6400 (made in USA) at investigated on various morphophysiological assessments genotypes.

Results: The results of analysis of measurements on samples studied in heading-flowering stages were higher in early-mature wheat genotypes than in other groups. It is clear from the difference between photosynthesis intensity at levels towards the end of vegetation whereas at leaves of the 7th level showed a sharp difference, difference in the 8th leaves was less.

In the first group, the intensity of photosynthesis at the beginning of the vegetation at durum wheat Garagylchyg-2 leaves of the 8th level was less than the 7th level leaves. This is due to the fact that the completion of lower level leaves growth leads to the growth of physiological activity on other upper level leaves.

In both variants at variety Garagylchyg-2, the photosynthetic intensity separetely on the 8th and 7th level leaves, respectively, was Fi-13,5; 15,9-11,2; 9,3 (mmol CO2 m-2s-1), CO2q- 432; 381-385; 375 (mmol CO2 mol1/2) and finally Ti-value 5.1; 5,82-4,8; 3.5 (mol H2O m-2s-1), at bread wheat genotype, Nurlu-99, in heading stage Fi-13.8, 12.4-11.6; 12.8 mmol CO2 m-2s-1, CO2q- 358; 372-364; 381 mmol of CO2 moll/2 and finally Ti-5,25; 6,13-4,38; 6,42 (mol H2O m-2s-1). In the flowering stage these figures increased, Fi-21,2; 18,6 - 20,9; 19,7 (mmol CO2 m-2s-1), Ti-8,92; 8,43 - 7,63; 8,21 (mol H2Om-2s-1), finally, in the third measurement, at grain filling stage comparing the observed previous measurements, the difference between variants was increased, while the difference between levels was decreased.

From here, it can be concluded that there is a difference between durum and bread wheat genotypes, compared to the other varieties whithin the group. This is due to the fact that fast-growing genotypes complite their development before the severe drought occure, which leads to a small difference in variants. On the other hand, the overlap between the variants in the late mature samples coincide with the prolongation of ripening period and occurrence of severe drought. This in turn ultimately leads to yield loss. In the future, it is important to pay attention to the fact that such genotypes should be taken as parental forms for creation of new varieties.

Key words: photosynthesis intensity, wheat varieties, maturity stage, drought resistance

Processing of Citrus Peel and Its Beneficial Properties

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Aim of the study: Citrus plants belongs to the family Rutaceae and they are well known for containing many beneficial nutrients for human beings. Citrus fruit residues (peel, pulp) is easily available representing a source of nutrients, essential nutritional supplements and supplements of vitamins C and P. Consumption of dietary fibre plays a significant role in the prevention, reduction, and treatment of chronic diseases such as bowel, gastrointestinal disorders, obesity, diabetes, cardiovascular disease, cancer and others. Citrus peel as waste contains a wide variety of secondary components with substantial antioxidant activity in comparison with other parts of the fruit. The purpose of the study is to process citrus residues and obtain the beneficial substances from it.

Materials and Methods: A number of studies have recognized the presenc e of polyphenols, vitamins, minerals, dietary fibres, essential oils and carotenoids content makes citrus a health-benefit subtropic. It is necessary to define the vitamins C and P content as the main source of the functional ingredient in citrus fruit; The content of various substances in the peel, juice and concentrate and their beneficial properties; Physico-chemical indicators during processing; Prescriptions of phenols, amino acids, essential oils, pectin, carotenoids and flavonoids for human health and to pay attention to other important factors.

Results: It is recognized that phenols, amino acids, essential oils, pectin, carotenoids, flavonoids and vitamin C, present in citrus fruits, have a beneficial effect on the prevention of degenerative diseases; Orange, lime, and lemon juices are as remedies for the prevention of the kidney stones formation; Grapefruits as agents able to lower blood pressure; Citrus flavonoids can modulate hepatic lipid metabolism; Orange juice can modulate inflammatory processes.

Citrus fruits were also seen to be a good source of many natural compounds: prenyloxycoumarins such as auraptene, bergamottin, imperatorin, heraclenin, oxypeucedanin and many others which have been isolated from the citrus juice and peel extracts. Studies have reported that plant phenolics are not only presenting edible parts of the plant but their presence with multiple biological effects have also been reported in non-edible parts of the plants.

I think it is necessary to process citrus before exhausting the residues and until obtaining the beneficial substances that are typical of citrus fruits to prevent all diseases.

Key words: citrus, flavonoids, phenols, biological, prevention, fibers, residues

Propagation of *Eucalyptus Leucoxylon* F. Muell from Seeds in Absheron Conditions

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The aim of the study: The scientific-research works carried out in the Institute of Dendrology Azerbaijan National Academy of Sciences to study the growth and development of Eucalyptus Leucoxylon in Absheron conditions, its phenological growth stages, favorable propagation methods, as well as its resistance to drought and frost.

Introduction: A wide range of environmental problems has emerged as a result of environmental pollution. One of these problems is the dimension of the plant gene pool and consequently, causing the huge damage to human health. A number of measures are being taken at country and global levels in order to solve this problem. Main measures taken are the building new parks, alleys, as well as planting of greenery in the residential and recreational areas. The some evergreen species of eucalyptus with ornamental features are widely used in restoration of degraded areas, draining marshy areas, protection of the environment.

Material and methods: The Myrtaceae or the myrtle family includes approximately more than 3000 species, 140 genera. Mainly its members are trees and shrubs growing in tropical and subtropical areas. It has been identified that worldwide, there are about 600 species of eucalyptus. The species of Eucalyptus L'Herit are mainly distributed in Australia, New Zeland and Tasmania.

Eucalyptus leucoxylon is one of eucalyptus species native to Australia. According to the literature, the height of ancient species is 23-28 m in Australia. The bark of the plant is rough, the lower part of the trunk is smooth and white. It is called “white woody” eucalyptus because of its white and ash-colored trunk. The length and width of its leaves are correspondingly 2.7 cm and 1 cm in the young stage, while this is 3.8 cm and 1.2 cm in mature stage and 2.8 cm and 0.5 cm in ancient trees. The flowering stage of eucalyptus leucoxylon begins in the 4-5 years of the growth. Flowers generally grow on the top of the tree or under the leaves in umbrella-shaped clusters. Umbel is ensheathed. Anther is adjacent, cut and its upper part have a slot. Corolla is woody and falls before blooming. Stamen filaments are yellow, white and pink-colored. The ovary is located below. Fruits are formed after blooming. At the beginning, its fruits are round and green, but as they ripen, they turn brown. Seeds are released from the fruit when it dried. The seed of Eucalyptus leucoxylon F.Muell is stalked and pear-shaped, its length and width are accordingly 0.1-0.3 mm and 0.01-0.02 mm. The seed not fully ripe, one or more seeds grow in the case, the color is black, smooth and small.

Results: The propagation of Eucalyptus Leucoxylon from seeds has been carried out in the Mardakan arboretum. The first shoots begin to appear 15-20 days later. White woody eucalyptus grows rapidly. Seeds sown in I ten days of June begin Seeds sown in the I ten days of June grow to 2.5.29 cm in the III ten days of June, while it is 14 cm in the III ten days of July. The length and width of the leaves in one-month shoot are accordingly 1 cm and 0.5 cm, the leaves of three-month shoot is 1.2-2 cm long and 1 cm wide. White woody eucalyptuses are moisture-loving and light loving plants. These plants are more adapted to warm and subtropical climates. Some species are resistant to mild frost. Even there are some species on mountain slopes that resist to -20-24 ° C frost.

The Negative Impact of Global Warming on Biodiversity

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Aim of the study: Currently there are 35 hot spots of biological diversity allocated on the earth. The Caucasus is one of these. In addition to this, it is included in among 200 Global eco-region allocated. Georgia, as the part of Caucasus, is rich of plant and animal diversity. Today, many species of animals being here are rare worldwide and are enlisted in the red list of international union of nature conservation (UCN).

Material and methods: climate changes and global warming problems is one of the significant issue in the world, since it is directly connected to reduction of the biodiversity and accordingly has the negative influence on the agricultural biodiversity, namely the area of agricultural crops spread, vegetation terms, and productivity, quality and biochemical indications of crops, marketing and other.

The local population exercised great damage due to the landslides and mudflows, it is expected that the period of animals grow-development and plants' vegetation to be decreased, which also will have affect to their health. Its 'demonstration/manifestation is different on the earth, on several continent it is significantly revealed, on some places insignificantly and some places it is almost impossible to be observed by the population.

The excessive heat affect the animal's appetite, secretion of gastric and intestine secretion is low, the morphological photo of the blood and the biological processes change, also changes heart work rate, breathe and etc.

Results: The global warming is caused due to the changes of the environment (shortage of water and food and other), some animals are leaving the naturally occupied territories and began migrations. In the new environment, they face to a lot of unsolved problems and such diseases, against which they do not have durability. During the global worming period, together with increase of heat it is possible to appear a lot of diseases of animals which might be harmful to the humankind/human.

As the observe of the climate held in Jun-September of the last year showed that, due to the effect of high temperature 35-40*C (more than three months) the state of the animals significantly deteriorated on all pastures and cattle stalls . Due to the draught, the grass on the pastures quickly dried, also the food and drinking water become deficient. In the puddles, which was the only source of drinking water, the supply reduced day-by day or they completely dried, in other puddles, which were located too far away from the pastures, the water was too warm, muddied, (due to the frequent travel of the cattle), and contaminated by manure and urine. The cattle/animal were less actively attracted by such water.

The animal/cattle stalls locating on these territories were not completely provided with water and animals/cattle were kept under low veterinary conditions. Mechanical and bacterial contamination of the milk produced was too high.

Only by caring about the animals/cattle (appropriate caring, feeding, water sourcing, and veterinary service) we will manage to avoid the problems and awaited economical loss caused by the global warming.

Keywords: biodiversity, temperature, animal, plant, warming, flooding, thirsty, disease

The Obtaining of Modificated Bioactive Compositions on the Bases of Simultenous Combined Processed of Plant Raw Material Essential Oils and Plumbagin

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The aim of investigation: To obtain more modificated bioactive composition and their use in medicine and cosmetic practice using well distillation ability of plant essential oils and derivatives of 1,4 naphtoquinone plumbagin (P) with water steam.

Material and methods: The roots, rhizome, overground parts of ceratostigma (*Ceratostigma plumbaginoids*), leaves of eucalyptus (*Eucalyptus globules*), rose petals (*Rosea damascene*), caraway seeds (*Carum carvi*) and coriander (*Coriandrum sativum*) were used as an essential oils raw material. The distillation with water steam of plant ester oils, obtained from above mentioned plants and derivative of 1,4 – naphtoquinone plumbagin was performed firstly by us with modified known method.

Results: Naphtoquinone-2 methyl-5 oxy, 1,4-naphtoquinone is well distillated by water steam under definite condition of plant raw material processing. On this base the new method of P obtaining from roots, rhiromes and overground parts of Ceratostigma plumbaginoides, cultivated in Azerbaijan is elaborated. The technology of P obtaining from plant raw material, the exception of chemical reagents, organic solvents (hexane, sulfuric ester) provide of output of specified purpose as compared with known method to be up 6 time greater. The method has been elaborated for rise of antibacterial activity of essential oils by means of reworked raw material with P producents. The antibacterial properties of obtained products as it was shown was significantly higher than in unmodified essential oils. Presence in oils unsignificant quantity of P increase there storage time. Under joint processing of essential oils raw material with P producents the water soluble bioactive composition, having significance in medicine and cosmetics were obtained.

The antiviral activity of hydrodistillate, containing 40 mg/l P and 55 mg/l essential oil of eucalyptus was investigated on pattern of Kosaki virus. The given composition as it is established has a virus activity and may be used for prophylactic aims as inhalation remedy under respiratory illness. On the base of results a patent was received.

The hydrodistillates containing 50 mg/l P and 70 mg/l ether oil of rose was tested in stomatology at medical treatment of sickness of mouth. The positive results were obtained.

It is known that crumble leaves of henna is used as means for reinforcing and restoration of hairs roots, where an active component is 2-oxy, 1,4 naphtoxynon (lavson).

To take into account that P is derivative of 1,4- naphtoquinone (P), oils of seeds of caraway and coriander 65 mg/l and 20% ethyl alcohol as a means for reinforcing, restoration and simultaneously colouring of hairs. As a results of investigations under patient with natural grow bald the positive effect has obtained, attained 90-95% with complete halt of hair prolapsed (the Eurasian patent was receipt). It should be noted that during medical treatment the massage of hairs promote to render of healthy also to nails, accelerate their growth and thickening of finger plate.

Key words: bioactive compounds, plumbagin, essential oils, distillation with water steam

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