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Biodiversity. Ecology. Adaptation. Evolution

dedicated to 180th anniversary
from the birth of famous physiologist
Ivan Sechenov
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OF THE IV INTERNATIONAL YOUNG SCIENTISTS CONFERENCE

«BIODIVERSITY. ECOLOGY.

ADAPTATION. EVOLUTION.»,

DEDICATED TO 180 ANNIVERSARY FROM THE BIRTH OF

FAMOUS PHYSIOLOGIST

IVAN SECHENOV

(ODESA, SEPTEMBER 16 - 19, 2009)

МАТЕРІАЛИ

IV МІЖНАРОДНОЇ КОНФЕРЕНЦІЇ

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АДАПТАЦІЯ. ЕВОЛЮЦІЯ.»,

ПРИСВЯЧЕНОЇ 180-РІЧЧЮ З ДНЯ НАРОДЖЕННЯ

ВИДАТНОГО ФІЗІОЛОГА І.М. СЄЧЕНОВА

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Thesae of reports reflecting contemporary level and main fields of research of Young scientists from Ukraine, Russia, Belarus, Moldova, Uzbekistan, Azerbaijan, Armenia, Georgia, Poland, Iran, USA and South Africa are presented in the book. The research fields include Botany, Zoology, Hydrobiology, Plant Physiology, Animal and Human Physiology, Ecology, as well as Molecular Biology, Genetics and Biochemistry.

Матеріали IV Міжнародної конференції молодих вчених «Біорізноманіття. Екологія. Адаптація. Еволюція.», присвячена 180-річчю з дня народження видатного фізіолога І.М. Сєченова (Одеса, 16 - 19 вересня 2009 р.).- Одеса: Печатний дом, 2009.- 208 с.

Збірка містить тези доповідей, в яких відображено сучасний стан та головні напрямки робіт молодих вчених України, Росії, Біларусі, Молдови, Узбекістану, Азербайджану, Вірменії, Грузії, Польщі, Ірану, США та Південної Африки в галузях ботаніки, зоології, гідробіології, фізіології рослин, фізіології людини та тварин, екології, а також молекулярної біології, генетики та біохімії.

Материалы IV Международной конференции молодых ученых «Биоразнообразие. Экология. Адаптация. Эволюция.», посвященная 180-летию со дня роджения известного физиолога И.М. Сеченова (Одесса, 16 - 19 сентября 2009 г.).- Одесса: Печатный дом, 2009.- 208 с.

В сборник вошли тезисы докладов, в которых отражено современное состояние и основные направления работ молодых ученых Украины, России, Беларуси, Молдовы, Узбекистана, Азербайджана, Армении, Грузии, Польши, Ирана, США и Южной Африки в областях ботаники, зоологии, гидробиологии, физиологии растений, физиологии человека и животных, экологии, а также молекулярной биологии, генетики и биохимии.

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One of Titans

to 180 anniversary of famous physiologist, professor Ivan Sechenov birth

Ivan Sechenov was known as the founder of scientific school of physiology in Russian empire (he was named “The Father of Russian physiology” by his follower, the Nobel Prize laureate Ivan Pavlov). He introduced electrophysiology into laboratories and also into teaching. His life work was always concentrated on neurophysiology. He wrote a major classic «The Reflexes of the Brain.» He also maintained that physiochemical factors in the environment of the cell are of equal if not greater importance.

He was constantly in conflict with the Russian government and his conservative colleagues. He will be remembered both for his intellect and his knowledge and for his scientific achievements. He was not only a physiologist but a philosopher-materialist and determinist, psychologist and teacher, scientific equipment engineer and at last a noble person with his own point of view.

Ivan Mikhaylovich Sechenov was born in August 1 (13), 1829 in settlement Tyoply Stan (now Sechenovo) near Simbirsk, Russia. Sechenov“s family was noble, but when his father died, Ivan (the youngest of the eight children) could get only home education. His mathematics teacher was a priest and foreign languages teacher was a child minder. When he was 14 he became a student of Main Military Engineering School in Saint Petersburg, which he finished in 1848. Then he worked for two years as a military engineer in Kiev (modern capital of Ukraine). But after one romantic date he understood that he really wished to became a doctor and serve people, then in 1850 he began to study medicine at Moscow University. Being a student of last years he changed his mind and became a physiologist. Sechenov dreamed to clarify causes of diseases and illnesses. Science and theory not medicine and practice became his choice. Then as one of the best students of the university he got a chance to study in Europe.

phase, immediately after heat treatment samples were incubated at the room temperature for 1 or 2 hrs. It was found that after 2 hrs of heat treatment (37°C) guaiacol peroxidase activity increased up to 1,26-, 1,37- and 1,48-fold in wild type, KO24 and KO25 Arabidopsis plants, respectively, but no significant difference between the wild type and both knockout mutants was observed. Upon severe heat shock we also observed activation of POD. After 2 hrs treatment at 44°C POD activity was 1,72- and 1,5-fold higher in KO24 and KO25, respectively, and only 1,16-fold higher in wild type Arabidopsis plants comparing to the control samples incubated in room temperature. Our new data show that activation of POD appears to be involved in heat stress response and can functionally compensate the partial loss of APX activity.

THE PIGMENTS MAINTENANCE IS CHARACTERISTIC PECULIARITY OF PLANTS ADAPTATION: EVOLUTION AND PERSPECTIVES STUDYING

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The confident contribution in development of photosynthesis different aspects the Ukrainian scientists did. O.M. Volkov shows the first, that at achievement of certain light minimum, which photosynthesis begins, in limits of comparatively low-light, the assimilation intensity is straight proportional lighting, and at subsequent growth of the last - goes out on a plateau, the height of which considerably differentiates at the plants of different systematic and ecological groups (Volkov, 1875). E.P. Votchal first researched photosynthesis and gas-interchange parallelly with account water balance, transpiration, leaves temperature, maintenance and high-quality composition of pigments with simultaneous registration of dynamics of geophysical factors (Votchal, 1939). K.A. Purievich set that: 1 - in the photosynthesis process it is not used more than 2,5% effulgent energy, which falls on a green leaf; 2 - for photosynthesis it is possible the using of mass and energy conservation law; 3 - in the photosynthesis process, depending on conditions, excepting carbohydrates, proteins and fats can be synthesized (Purievich, 1913). V.M. Lyubimenko found out the light-admired nature and shade-hardiness of tree species and other plants, he is deep studied the dependence of photosynthesis process on chlorophyll maintenance in a plant and dynamics of environmental conditions, the first shows, that different plants have different light threshold (Lyubimenko, 1963). Subsequent fundamental researches from photosynthesis ecophysiology were conducted in Institute of physiology and genetics of the Ukrainian National academy of sciences.

Change of pigments maintenance and content under the stress factors action is stipulated the intensities correlation of their synthesis and hydrolysis. Thus, row of authors mark more considerable changes at the stress factors action in the

"a" than "в" chlorophyll and explain this process labiality of first which serves as substance for a biosynthesis of the second one (Yeo, 1998). Greater stability of "в" chlorophyl at stresses is explained continuation of his biosynthesis from "a" chlorophyl on a background of the all stopping of biosynthesis the last.

The increase of yellow pigments maintenance at stresses is explained the chlorophylase activating and stopping of green pigments synthesis, and substance of CH_3CO-COA is directed for the biosynthesis of other plastid (yellow) and without-plastid (anthocyanins) pigments. Thus, salinity stipulates the considerable changes of maintenance and contest pigments at plants, including halophytes, diminishing maintenance of green pigments at sudden salt stress and promoting - at gradual. The yellow pigments contents rises in both cases.

SOME ECOLOGICAL AND BIOLOGICAL FEATURES OF *CROTALARIA ALATA* L. AND *GUIZOTIA ABYSSINICA* (L.F.) CASS. INTRODUCING IN UZBEKISTAN

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The object of present research had been to select new to Uzbekistan unconventional, forage crops - *Crotalaria alata* L. and *Guizotia abyssinica* (L.f.) Cass. Both species perfectly grow in irrigation conditions.

The most optimal term of crop sowing is the beginning of May. Shoots appear in 3-4 days after sowing. The root goes deep up to 4-6 sm. In the middle of June the height reached 40-50 cm, and at the end of month 90-100 cm heights, the beginning budding was marked. The phase of flowering was marked in the beginning of July and last up to the end of November. In the middle of July, at height of 140-150 cm the plant mass blossoms and fructifies. In the middle of August 30 % of seeds has ripened. At this time their height reached 200-270 cm, at the end of September - 2,5-3 m, mass fructifies. The root goes deep to 25-30 sm. It is necessary to note, that at this time plant eddish is high, a hay-crop can be obtained two times in the middle of July and at the end of September. Productivity of dry fodder weight was made 140-180 centner/he, and with seed efficiency of 10-20 centner/he. Crotalaria raises the fertility of soil and due to the long period of flowering represents significant interest for beekeeping.

The crops were made in the beginning of May. In the middle of June the height of main shoot reached 32-35 cm, quantity of leaves made up to 13-18. The main root with 12-14 cm length forms the root system and 7-8 second order lateral roots 3-3,5 cm of length. When the plant was 40-50 cm high beginning of budding was noticed at the end of the month. To the middle of July half of plants blossomed, the height of plants was 140 cm on average. The quantity of flowers in inflorescence varied from 40 up to 210 flowers. In the beginning of August 70-75 % of plants blossomed and drying of 7-8 bottom leaves (height of plants make up to 160 cm on average) was observed. The maturation of 6-10%

birth

Contents

Nemetsalov V.V., Karpov L.M.
ONE OF TITANS: TO 180 ANNIVERSARY OF FAMOUS PHYSIOLOGIST, PROFESSOR IVAN SECHENOV BIRTH 3

Section 1. Botany and mycology

Agurova I.V., Torokhova O.N.
THE EVOLUTION OF EDAPHOTOPE AND VEGETATION IN CONDITIONS OF INDUSTRIAL WASTE DISCHARGE (DUMPS) IN DONBASS 6
Ahmad Afkari bajehbaj
THE ROLE OF *AZOSPIRILLUM LIPOFERUM* BACTERIA IN SUSTAINABLE PRODUCTION OF SUNFLOWER (*HELIANTHUS ANNUUS* L.) 7
Bandurko V.
SPATIAL AND DEMOGRAPHIC CHARACTERISTICS OF THE SPECIES OF GENUS STIPA L. ON THE TERRITORY OF THE RLP «KLEBAN-BYK» 8
Bely P.
LICHEN FLORA OF BEREZINSKY BIOSPHERE RESERVE: MODERN STATE 9
Berdibaeva D.B.
OFFSHOOT FORMATION AND THE VITAL FORMS OF SOME SPECIES OF GRASSES (FAM. POACEAE) IN THE SOUTH-WESTERN KIZILKUM 10
Bielecka K.
SYNANTHROPIC FLORA EXEMPLIFIED BY PLANTS GROWING ALONG RAILWAY LINES OF THE „DRY PORT" IN MAIASZEWICZE (POLESIE REGION, EAST POLAND) 10
Boburczak K., Sajkiewicz R., Lozynska H., Olejnik N., Urbaniak Z., Szrama K., Szukaia J., Szygendowski T.
ECOLOGY AND DISTRIBUTION OF *DAPHNE MEZEREUM* POPULATION ON DZIEWICZA GYRA NEAR POZNAN (WEST POLAND) 12
Bondarenko E.
PLANTS WITH HIGH INVASIVE ABILITY IN FLOROCOMPLEXES OF PASTURE IN THE SOUTH PART OF ODESSA REGION 12
Borodina E.V., Vishnevskaya N.A., Strunnikova O.K.
INFLUENCE OF CONDITIONS ON COLONIZATION ABILITY OF *FUSARIUM CULMORUM* 13
Chebotar G., Chebotar S., Motsnyy I., Nagulyak O.
FROST RESISTANCE OF ANALOGUE WHEAT LINES DIFFERRING ALLELES OF DWARFING GENES 14
Cherepanova O., Petrova I.
INTRASPECIES VARIABILITY OF *PINUS SYLVESRTIS* L. 15
Chernetskyy M.
XEROMORPHIC TRAITS OF LEAVES OF CHOSEN SPECIES OF *KALANCHOË* ADANS. GENUS 16
Davidjuk Y.M., Zhybak M.T., Volkov R.A.
MOLECULAR ORGANISATION OF THE 5'ETS IN THE 35S RDNA OF *SOLANUM MAMMOSUM* L. 17

Derevyanskaya A.
BASIC WAYS OF FORMATION OF PHYTODIVERSITY OF THE TECHNOGENIC METROPOLIS DONETSK-MAKEYEVKA 18
Dreval K.
CELLULOLYTIC ACTIVITY OF WOOD-DEGRADING FUNGUS *IRPEX LACTEUS* (FR.) FR. AND *ANTRODIA SINUOSA* (FR.) P. KARST. 19
Galyas A.V.
THE HIGHER WATER PLANTS OF SOME RESERVOIRS OF BIOLOGICAL TREATMENT IN THE KURSK AREA 19
Garkusha O.P.
THE RESTING STAGES OF SEAWEEDS IN THE ODESSA BAY SANDY BEACHES 20
Gerasimyuk N. V., Gerasimyuk V. P.
MICROPHYTOBENTHOS OF RIVER KODYMA 21
Gladkikh A.S., Tikhonova I.V., Belykh O.I., Ivanova E.I.
DETECTION OF MICROCYSTIN SYNTHETASE GENES IN CYANOBACTERIA FROM LAKE KOKOTEL (BURYATIA, BAIKAL REGION) 22
Gorbulin O.S.
INDICATOR FORMS IN COMPOSITION THE ALGAFLORA OF RIVERS 23
Griber J.A.
THE SPECTRAL STRUCTURE OF THE OPEN GROUND DECORATIVE PLANTS OF THE SMOLENSK REGION 24
Gryshchenkova N.D., Vlasov B.P.
USE OF THE PHYTOINDICATION METHOD AT DEFINING OF AN ECOLOGICAL STATE OF THE LAKES OF THE NATIONAL PARK «NAROCHANSKY» 25
Halbekova H.U.
THE ADAPTATION PECULIARITIES OF *SALICORNIA EUROPAEA* L. (CHENOPODIACEAE) FLOWER TO HALOFACTOR 26
Ibadullayeva S.J., Talibov T.H., Salayeva Z.K.
SOME RARE SPECIES OF GEOPHYTES OF NAKHICHIVAN AR, AZERBAIJAN 27
Kapeljuch N.V., Zavjalova A.S.
THE STATE OF PHOTOSYNTHESIZING ORGANS OF THE PLANTS OF *PLATANUS ORIENTALIS* L. AND *P. ACERIFOLIA* WILLD. SPECIES IN THE CONDITIONS OF INDUSTRIAL POLLUTION 28
Kazarinova A.O.
ECOLOGICAL AND CENOTIC PECULIARITIES OF THE RARE SPECIES OF THE OAK FORESTS IN THE NORTHERN PART OF NATIONAL NATURE PARK "GOMOLSHANSKY FORESTS" 29
Khodosovtseva Yu.A.
AIR POLLUTION MAPPING USING LICHEN INDICATORS IN URBANIZED LANDSCAPE OF THE YALTA AMPHITHEATRE (CRIMEA, UKRAINE) 29
Kiryushkina A. N., Gerasimyuk V. P., Shikhaleeva G. N.
ALGAE EPHEMERAL RESERVOIRS OF THE NORTH-WEST BLACK SEA AREA 30
Klujkova I.S.
SEEDS RENEWAL OF SOME KINDS OF ORCHIDACEAE OF A MODERATE ZONE IN CONDITIONS OF THE BOTANICAL GARDEN OF TVER STATE UNIVERSITY 31

Kolesnik O., Chebotar S., Khokhlov A., Sivolap Yu.
GRAIN MORPHOMETRIC CHARACTERIZATION OF THE MODERN UKRAINIAN WHEAT VARIETIES USING COMPUTER ANALYSIS 32
Korniyenko O.M.
INTRODUCING THE BRAHMS HERBARIUM SOFTWARE IN UKRAINE: THE CASE STUDY OF THE N.S. TURCHANINOW TYPE COLLECTION AT KW ... 33
Kositsyna A.A., Makurina O.N., Rozencvet O.A.
INFLUENCE OF CADMIUM IONS ON ENZYMATIC ACTIVITY OF *EGERIA DENSA* TISSUES 34
Kurakina K., Chebotar S., Khokhlov A.
THE ANALYSIS OF PHYSICAL HARDNESS IN WHEAT VARIETIES OF UKRAINIAN SELECTION 35
Lebedev A.N.
THE SLIME MOULDS FROM THE BOTANICAL GARDEN OF TVER STATE UNIVERSITY 36
Lebedeva A.
EFFECTS OF HEAT SHOCK AND EXOGENOUS GIBBERELLIC ACID ON AMYLOLYSIS IN GERMINATING WHEAT GRAINS 37
Legeta U.V.
ESTIMATION OF A LEVEL DIVERGENCE OF ATTRIBUTES MORPHOLOGY ATTRIBUTES OF POPULATIONS *TUSSILAGO FARFARA* L. TERRITORIES OF CHERNOVTSY AREA 38
Levanets A., van Rensburg L.
GENUS *MICRASTERIAS* AG. EX RALFS (DESMIDIACEAE, CHLOROPHYTA) IN SOUTHERN AFRICA 39
Linnik M. A., Prokhorov V. P.
CHAETOMIUM SPECIES OF MOSCOW REGION 39
Litvinenko S.
EPIPHYTIC BRYOPHYTES OF BEECH FORESTS ('CESINO' LANDSCAPE RESERVATION) 40
Lozynska H., Bielecka K., Bogawski P., Gawior A., Haluszka M., Komorowska E., Malec K., Olejnik N., Szrama K., Walkiewicz A., Zgrabczynska M.
CHANGES IN VASCULAR FLORA OF „PANSKA GORA" NEAR POZNAN (WEST POLAND) 41
Mamedova A.D., Gasanova G.I.
ADAPTIVE DIFFERENCES OF COTTON SORTS OF *G. BARBADENSE* L. TYPE DURING SALINIZATION 42
Mamedova N.Kh.
PHYTOPATHOLOGIC ESTIMATION OF RESISTANCE OF VARIETIES OF SUGAR BEET TO DISEASES 43
Mamenko T.P., Yaroshenko O.A.
ADAPTIVE MODIFICATIONS OF ANTIOXIDANT PROCESSES IN WINTER WHEAT LEAVES INDUCED BY PROLONGED DROUGHT 44
Mangaladze N., Cheishvili T., Kiladze N., Lasxishvili M.
THE INFLUENCE OF HEAVY METALS ON THE VEGETABLE CULTURES .. 45
Mehvaliyeva U.A., Babayev H.G., Khaligzade M.N., Guliyev N.M.
EFFECT OF LIGHT INTENSITY ON C_4-ENZYMES OF *AMARANTHUS CRUENTUS* L. PLANTS 46

Mojsejchik E.V., Sozinov O.V.
WETLANDS OF THE RIVER NACHA (BELARUS) 47
Morozova T.V., Kovrik O.M.
BIOTESTING OF SOILS OF INDUSTRIAL AREAS BY *LEPIDIUM SATIVUM* L. 47
Morozova T.V., Pushkar N.M.
USE OF ANTHERIFEROUS METHOD FOR BIOINDICATION IN THE VOLUNTARILY SETTLING OUT AREAS OF THE CHERNIVTSY REGION 48
Morozova T.V., Ryaba I.V.
MORPHOMETRIC PARAMETERS OF FRUITS AND SEEDS OF *ROBINIA PSEUDOACACIA* L. IN THE AREAS OF THE VOLUNTARILY SETTLING OUT OF CHERNIVTSY REGION 50
Mosyakin A.S.
A NEW INVASIVENESSS HYPOTHESIS BASED ON TAXONOMIC AND MICROEVOLUTIONARY PATTERNS OF VASCULAR PLANTS 51
Movsumova N.V., Ibadullayeva S.J., Sultanova S.R.
SOME RARE SPECIES OF FAMILY APIACEAE OF NAKHICHIVAN AR, AZERBAIJAN 52
Niepiein A.
ADAPTATIONS TO CONCRETE ECOLOGICAL CONDITIONS AND REPRODUCTIVE STRATEGY FEATURES OF *FRAILEA* (CACTACEAE) REPRESENTATIVES 53
Nor V., Barisheva V., Nekrasov K.
MODIFICATION C - MITOSIS IN THE ROOTS OF CARYOPSISES OF BARLEY, TREATED BY AN ACENAPHTHENE, BY EXTRACTS FROM *ECHINACEA PURPUREA* 53
Novikoff A.
THE LEAF BLADE ANATOMY OF SOME ACONITES FROM THE EASTERN CARPATHIAN MOUNTAINS 54
Nykyrsa T.
THE ANTHROPOGENIC CHANGES OF THE HOTYNS'KA HEIGHTS FLORA 55
Omelchuk O., Prots B.
PLANT TRAITS AS INDICATORS OF FLOODPLAIN ECOSYSTEMS FUNCTIONING 56
Pieszyk N., Galas D., Mryz P., Konieczna M., Jarmoiowski A.
ENVIRONMENTAL STRESS ADAPTATION IN *ARABIDOPSIS THALIANA* (L.) HEYNH. 57
Popkova L.L.
PROPAGATION AND CONSERVATION *IN VITRO* OF SOME ORNAMENTAL SPECIES of CRIMEAN ORCHIDS 57
Prjazhnikova A.A., Rykovskij G.F.
BRYOFLORISTIC RARITIES ON CONCRETE FORTIFICATIONS IN GRODNO VICINITIES (BELARUS) 58
Pyrizhok Roman Yu., Panchuk Irina I.
COMPENSATIVE ROLE OF GUAIACOL PEROXIDASE IN APX2-DEFICIENT *ARABIDOPSIS MUTANTS* UPON HEAT STRESS 59

Pyurko O.E., Khrystova T.E.
THE PIGMENTS MAINTENANCE IS CHARACTERISTIC PECULIARITY OF PLANTS ADAPTATION: EVOLUTION AND PERSPECTIVES STUDYING 60
Rakhimova N.
SOME ECOLOGICAL AND BIOLOGICAL FEATURES OF *CROTALARIA ALATA* L. AND *GUIZOTIA ABYSSINICA* (L.F.) CASS. INTRODUCING IN UZBEKISTAN 61
Rubanovska N.
PROTECTION AND RECREATION OF RARE SPECIES OF *ALLIUM* L. OF NATIONAL NATURE PARK «PODILSKY TOVTRY» 62
Savinov I.A.
CONCEPTION OF SPECIES FOR RUSSIAN AND UKRAINIAN REPRESENTATIVES OF THE GENUS *EUONYMUS* L. (CELASTRACEAE R.BR.) 63
Scherbakov S.M., Bodnar I.V., Baranov V.I., Horbulinska S.M., Bodnar L.S.
ECOLOGICAL-GENETIC ANALYSIS OF WATER RUNOFF FROM THE COAL MINE BANK OF CZF ZAT "LVIVSYSTEMENERGO" AND ITS INFLUENCE ON HERBACEOUS AND WOODY PLANTS 64
Shcherbakova J.
STUDY OF PHYSIOLOGICAL BIOCHEMICAL CHARACTERISTICS OF CUCUMBER SEEDLINGS IN CASE OF DAILY PROCESSING WITH SALT SOLUTIONS Zn, Mn, Cu, Mo 65
Shikhlinski H.M.
MICROORGANISMS CAUSING ROTTING OF GRAPE ROOT INFECTED BY PHYLLOXERA IN FUZULI REGION CONDITION 66
Shiyan N.M., Korniyenko O.M.
AUTHENTIC HERBARIUM MATERIALS FROM AFRICA IN THE N. S. TURCZANINOW COLLECTION 67
Sichkar S.V., Yastrebova O.V., Korobkova K.S.
THE ROLE OF CARBOHYDRATE COMPONENTS OF GLYCOCALIX IN ADAPTATION OF MOLLICUTE TO PERSISTANCE IN PLANTS 68
Simagina N.O.
ALLELOPATHIC ACTIVITY OF INTRODUCED SPECIES 69
Sischuk M., Yunyk T., Sischuk N., Yatsyk R., Stupar V.
SOLUTION OF PROBLEMS OF INTRODUCED PLANT ADAPTATIONS IN CONDITIONS OF UKRAINIAN CARPATHIANS NORTHERN MEGASLOPE . 70
Smolyanyuk E.V., Bilanenko E.N.
HALOTOLERANT MICROMYCETES FROM HYPERSALINE ENVIRONMENTS (POMORIE SOLAR SALTERNS, BULGARIA) 71
Stadnichenko M., Lapunova T., Polyksenova V.
THE STEROID GLYCOSIDES AND THE SYSTEM FUNGICIDES AS INDUCTORS OF IMMUNITY AND REGULATORS OF GROWTH F_2 OF TOMATO CULTURE 72
Surina E.V.
MICOPATHOGENIC INFECTION AND LEVEL OF INSECTICIDE RESISTANCE IN THE COLORADO POTATO BEETLE POPULATIONS 73
Sysenko E.I., Kuznetsova Yu.A.
HYDROPONIC CULTURE OF WHEAT SEEDLINGS AS TEST-SYSTEMS FOR WATER QUALITY ESTIMATION 74

Szrama K.
CONTEMPORARY EXPANSION OF SELECTED SPECIES OF SYNANTHROPIC FLORA AND THEIR ROLE IN THE FORMATION OF PLANT COMMUNITIES IN WIELKOPOLSKA 75
Szymczak G.
INSECTS' INTEREST IN STAPELIAD FLOWERS (*APOCYNACEAE-ASCLEPIADOIDEAE-CEROPEGIEAE-STAPELIINAE*) CULTIVATED IN GREENHOUSE CONDITIONS 76
Timofijchuk O.A.
BIODEGRADATION OF FILMS FROM POLYVINYL ALCOHOL AND ORGANIC FILLING MATERIALS 76
Tokaryuk A.
SCORZONERA PURPUREA L. (ASTERACEAE) IN THE FLORA OF THE BUKOVYNSKE PRYKARPATTYA 77
Tynkevich Y.O., Oplachko L.T., Volkov R.A.
INTRAGENOMIC HETEROGENEITY OF 5S RIBOSOMAL DNA IN ROSACEAE 78
Vasilyeva A.A., Chekunova L.N.
FILAMENTOUS FUNGI, GROWING IN AVIATION FUEL 79
Vasylyeva T.V., Nazarchuk Ju.S., Lyalikov Ja.V.
ORNITHOGALUM REFRACTUM SHLECHT ON THE ZMEINIY ISLAND 80
Volutsa O., Korzhan Ks.
NEW SPECIES OF CHERNIVTSY REGION FLORA 81
Zadorogna K.V., Bocharova B.R.
A MOLECULAR-GENETIC POLYMORPHISM OF GRAPE CLONES AND CULTIVARS 82
Zarei-Darki B.
ABOUT ECOTOPES OF THE BLUE GREEN ALGAE IN THE IRAN'S WATER BODIES 82
Zgrabczynska M., Brzeg A.
STRUCTURE, PHYSIONOMY, FLORISTIC COMPOSITION AND ECOLOGY OF THE ASSOCIATION *SONCHO PALUSTRIS-ARCHANGELICETUM LITORALIS* T.RX. 1937 IN WIELKOPOLSKA (POLAND) 83
Zhuk V.V., Kapustyan A.V.
THE EFFECT OF HIGH TEMPERATURE AND CYTOKININS ON THE PIGMENTS OF WHEAT LEAVES 84
Zhuk I.V., Musienko M.M.
NO EFFECT ON PEROXIDASE ACTIVITY OF WHEAT LEAVES UNDER HIGH TEMPERATURE STRESS 85
Zolotov D.
INFLUENCE OF AN ALIEN ELEMENT ON CHOROLOGICAL COMPOSITION OF STEPPE AND FOREST-STEPPE FLORAE IN ALTAY KRAI (RUSSIA) 86
Zoobtsova E.A.
INFLUENCE OF STORAGE PERIODS ON GERMINATION OF *PAEONIA TENUIFOLIA* L. SEEDS 87
Zvyagintseva K.A.
ANALYSIS OF THE BIOECOLOGICAL DENDROFLORA STRUCTURE OF KHARKIV (UKRAINE) 88

Section 2. Fauna of terrestrial ecosystems

Burdeynaya S.Y., Kivganov D.A.
THE MITES OF GENUS *TROUESSARTIA* OF PASSERINE BIRDS, THAT MIGRATe THROUGH ZMEINY ISLAND 90
Cherdincev A., Gaevskaya M.
BIOTOPIC ALLOCATION OF LEPIDOPTERA IN ORENBURG REGION 90
Chernichko K.I., Kivganov D.A.
REVIEW OF QUILL MITES OF THE FAMILY SYRINGOPHILIDAE 91
Czapracka A., Jurczyszyn M.
PREDICTIONS OF CHANGES IN POPULATION SIZE OF REINTRODUCED EDIBLE DORMOUSE (*GLIS GLIS* L.) - MODELLING POPULATION DYNAMICS BY USING VORTEX 92
Delhi Olga F.
KARAKURT (*LATRODECTUS TREDECIMGUTTATUS* (ROSSI, 1790)) IN THE SOUTH PART OF ODESSA REGION 93
Dudek K., Ekner A., Sajkowska Z.
MORPHOLOGICAL VARIATION OF THE CEPHALIC SCALES IN SAND LIZARD *LACERTA AGILIS* AND COMMON LIZARD *ZOOTOCA VIVIPARA* 94
Ekner A., Dudek K., Sajkowska Z., Antczak M.
NEW METHOD OF LIZARD MARKING 95
Fahretdinova S.A., Ilyasov R.A., Poskryakov A.V., Nikolenko A.G.
PROSPECTS OF WILD BEE POPULATIONS PRESERVATION OF BURZJAN DISTRICTS IN BASHKORTOSTAN *APIS MELLIFERA MELLIFERA* L. 96
Fedoryak M., Sitnikova I.
THE AGE-SEXUAL STRUCTURE OF THE POPULATIONS OF COMMON SYNANTHROPIC SPIDERS OF CHERNIVTSI CITY 96
Gaevskaya M., Cherdincev A.
BEES OF MEGACHILE LATREILLE SORT OF ORENBURG REGION FAUNA 97
Gordiy N.
BUTTERFLIES (LEPIDOPTERA, DIURNA) ARE AN INDICATOR GROUP 98
Ilyasov R.A., Poskryakov A.V., Nikolenko A.G.
POPULATION GENETICS ANALYSIS OF BEES FROM POPULATIONS OF URAL AND VOLGA REGIONS 99
Kalinitshenko E.V., Skoropud E.V., Averyanov G.Y., Schulyakova S.V., Mihaylova A.G., Gorshkova O.G., Lirnik O.I., Sipina O.N., Lutshko A.N., Gudzenko T.V.
ISOLATION OF CARBOHYDRATES BACTERIUM-DESTRUCTORS FROM THE SOILS OF ZMIINIY ISLAND 100
Kalinowski T.
PROTECTION OF BATS IN POLAND 101
Keivan O., Tertichna O.
COLEOPTERA OF DIFFERENT BIOTOPS IN THE EXPERIMENTAL STATION SKVIRA OF INSTITUTE OF AGROEKOLOGY OF UAAS 101
Kolesnyk D.N., Danchenko E.A., Zdorovtseva L.N.
INFLUENCE OF NETTLE DICLINOUS ON STORAGE OF STUNNING DEPENDING ON AN INITIAL CONCENTRATION OF PRODUCTS OF LIPOPEROXIDATION IN IT 102

Kul'bachko Y., Loza I., Pakhomov O., Didur O.
THE ROLE OF SOIL INVERTEBRATES IN BIOLOGICAL OPTIMIZATION OF TERRITORIES FAULTED BY COAL MINING 103
Legeta Y.
TO A QUESTION OF EXPEDIENCY OF USE OF KINDS COCCINELLIDAE IN ECOLOGICAL RESEARCHES 104
Mihaylova A.G., Procischina N.M., Korzyukov E.O., Kalinitshenko E.V., Gorshkova O.G., Lirnik O.I., Sipina O.N., Lutshko A.N., Gudzenko T.V.
DETECTION OF THE TICK-BORN ENCEPHALITIS VIRUS FROM THE BIRDS MIGRATING THROUGH THE ZMIINIY ISLAND OF 2008 105
Oleinikova A.A., Syrgko L.F., Garabadgiu A.V.
BIOREMEDIATION SOIL, POLLUTED PAHS 106
Poltorak N.P.
STATE-OF-THE-ART INFORMATION TECHNOLOGIES FOR PROTECTION AND STUDYING WILD ANIMALS' ACTIVITY 107
Sajkowska Z., Ekner A., Dudek K.
THE INFLUENCE OF WEATHER ON SAND LIZARD (*LACERTA AGILIS*) AND COMMON LIZARD (*ZOOTOCA VIVIPARA*) BEHAVIOR 108
Sapunkova N.Y.
BIRDS- AS A SOURCE OF BIODAMAGE TO ELECTRIC EQUIPMENT AT THE ATOMIC POWER-PLANTS 108
Sargsyan A.M., Movsesyan H.S.
BIOLOGICAL EFFECTIVENESS OF BACTERIAL INSECTICIDES AGAINST GYPSY MOTH UNDER LABORATORY CONDITIONS 109
Trach V.A.
ABOUT FAUNA OF COLEOPTERA ON THE SAND SPITS IN THE NORTH-WESTERN PART OF THE BLACK SEA SHORE 110
Voronova N.V.
MORPHOLOGICAL AND GENOMIC VARIABILITY IN *MACROSIPHUM GEI* KOCH (*HOMOPTERA*: APHIDIDAE) 111
Zhulai V.E., Melnychuck S.D., Peryn V.V.
INVESTIGATION OF ORAL TOXICITY OF AT-A-5 PREPARATION FOR HONEYBEES 112
Zhulai V.E., Melnychuck S.D., Peryn V.V.
INVESTIGATION OF ORAL TOXICITY OF DYCAMERON PREPARATION FOR HONEYBEES 113

Section 3. Fauna of aquatic ecosystems

Adamovich B., Voronova G., Prischepov G., Kucko L., Sennicova V.
THE TROPHIC STATE AND FISH COMMUNITY IN DNIEPER RIVER 115
Biserova N.A.
DISTRIBUTION AND SIZE-STRUCTURE OF THE SEA URCHIN *STRONGYLOCENTROTUS DROEBACHIENSIS* IN THE COAST OF THE KOLA PENINSULA 116

Danyliv S.I.
INFLUENCE OF CHROMIUM (VI) IONS ON THE LYSOZYME ACTIVITY IN ORGANS OF *CYPRINUS CARPIO* L. 117
Dobrova G.O., Averjanov G.Y, Gorshkova E.G., Lisyutin G.V., Biloivanenko S.O., Bukhtiyarov A.Y.
ANTIBIOTICS AND METAL RESISTANT BACTERIA IN COASTAL WATERS OF ZMIINY ISLAND 118
Druzenko O.V., Zamorov V.V., Andryevski A.M., Ryzhko I.L., Kucherov V.A.
ESTEROLITIC SYSTEM ENZYMES OF *NEOGOBIUS MELANOSTOMUS* DWELLING IN THE VICINITY OF ISLAND ZMEYNYI 119
Fluent R.
SEASONAL DYNAMICS OF *SALMO TRUTTAE* M. *FARIO* PARASITES' FAUNA FROM RYBNYK MAJDANSKYJ RIVER (BASIN OF DNIESTER, NORTHERN SLOPES OF THE EASTERN CARPATHIANS) 120
Mosends E., Dzhurtubaev M.
MACROZOOBENTOS OF DANUBIAN CHANNEL "OBCHESTVENNY" 121
Nemertsalova S.V.
JUDICIAL STATUS OF THE TERM BIODIVERSITY 122
Starosyla I.
THE MICROBIOLOGICAL CHARACTERISTIC OF THE RESERVOIRS POLLUTED BY MINERAL NITROGEN 123
Stoyanova M.A., Skoropud E.V., Schulyakova S.V., Kalinitshenko E.V., Mihaylova A.G., Averyanov G.Y., Gorshkova O.G., Lirnik O.I., Sipina O.N., Lutshko A.N., Gudzenko T.V.
BIOLOGICAL PROPERTIES OF *PSEUDOMONAS AERUGINOSA* CULTURE, ISOLATED FROM A RESERVOIR WITH TECHNICAL WATER 124
Zhukava H.
BENTHIFICATION OF LAKE NAROCH: INFLUENCE ON STRUCTURE AND PRODUCTIVITY OF AUTOTROPHIC COMMUNITIES 125

Section 4. Physiology and biochemistry of human and animals

Adamyan N.Y., Akopyan N.S., Harutyunyan R.S., Karapetyan M.A.
THE FORNIX AS A CONNECTING LINK BETWEEN HYPPOCAMPUS AND HYPOTHALAMUS DURING REGULATION OF BREATHING IN HYPOXIA 126
Adamyan Ts.I., Gevorkyan E.S., Voskanyan A.B.
ANALYSIS OF THE PERIPHERAL BLOOD UNDER POISON INFLUENCE ... 127
Ahmadova A.F., Rahimova R.M., Abdullayeva N.A.
ROLE OF LACTIC ACID BACTERIA IN ECOLOGY AND BIOPRESERVATION OF FOOD 128
Arhipova M.N., Shukanov R.A., Bochkarev S.V., Shukanov A.A.
HOG FUNCTIONAL SYSTEM IMPROVEMENT UNDER BIOGEOCHEMICAL CONDITIONS OF THE SURA AREA IN ALATYR DISTRICT, CHUVASH REPUBLIC 129

Boiko M.S., Onuphrienko O.V.
NEUROPHARMACOLOGICAL PROPERTIES OF NEW 3-SUBSTITUTED 1,2-DIHYDRO-3H-1,4-BENZODIASEPIN-2-ONES 130
Budnyak O.L., Budnyak O.K., Zaharieva Z.E.
CONCENTRATIONS OF C AND B2 VITAMINS IN ORGANS OF BLACK SEA MUSSELS MYTILUS GALLOPROVINCIALIS AFTER ACTION OF COPPER AND ZINC IONS 130
Chorna V.I., Lyanna O.L.
PARTICIPATION OF CYSTEINE PROTEASES AND THEIR ENDOGENOUS INHIBITORS OF LYSOSOMES IN BRAIN CARCINOGENESIS 131
Denysova O.M., Zhegunov G.F., Pocusay G.G.
CRYOPRESERVATION EFFECT ON ATP LEVELS AND 2,3-DPG OF ANIMALS' ERYTHROCYTES 132
Dushak I.V., Vitkovskaya M.V.
STATE OXIDANT AND ANTIOXIDANT SYSTEMS IN ORGANS OF RATS AFTER FRACTIONED X-RAY IRRADIATION 133
Dvorshchenko C.O., Vakal S.E., Chaika V.O., Bezdolnaya I.S., Ostapchenko L.I.
ACTION OF A STRESS ON ACTIVITY OF MEMBRANE MARKER ENZYMES AND THE CONTENT OF ATP IN STOMACH MUCOSA CELLS AND HEPATOCYTES OF RATS 134
Falchenko K.V., Kot Yu.G.
MECHANICAL STRESS STRAIN EFFECT ON INTENSITY OF COLLAGEN TYPE I PROCESSING AND STRUCTURAL STABILITY OF ITS SUPRAMOLECULAR FORMATIONS 135
Fedoruk I., Chorna L.
MOLECULAR GENETIC ANALYSIS OF GENES INVOLVED IN FOLATE METABOLISM AMONG CLEFT LIP/ PALATE PATIENTS 136
Fyodorova S.V., Madich A.V.
INFLUENCE OF INSULIN AND EPIDERMAL GROWTH FACTOR ON THE CULTURE FEEDER CELLS PROLIFERATION AND IN VITRO OOCYTE MATURATION IN BOVINE 137
Garaeva O.I.
CHANGES OF THE OXIDIZED GLUTATHIONE'S CONTENT IN BLOOD OF SPORTSMEN-SWIMMERS AT STRESS 138
Garaeva O. I., Postolaty G. V., Redkozubova G. V., Kovarskaja N.V.
THE FEATURES OF FREE AMINO ACIDS FUND IN BLOOD PLASMA AND URINE OF INHABITANTS OF MOLDOVA 139
Garkavenko V.
THYROID HORMONE NON-GENOMIC REGULATION OF LIPOGENESIS IN THE LINES OF ADULT AND OLD RATS 140
Gladkaya E. A., Ganusova G.V.
ACTIVITY OF ANTIOXIDANT ENZYMES IN RAT OVARIES UNDER MERCURY CHLORIDE ACTION 141
Gordienko J.A., Nikolaenko T.P., Gruntkovskaya O.E., Shevtsova A.I.
THE ACTIVITIES OF THE MATRIX METALLOPROTEINASES IN THE HYPERCOAGULABLE STATES 142
Hubich A.I., Petrova S.M.
THE INVESTIGATION OF HEPATOPROTECTIVE ACTION OF 9,11-ETHANO-PROSTAGLANDIN H ANALOGS IN VITRO 143

Jaremko O.V., Golovach P.I.
THE PECULIARITIES OF MORPHOFUNCTIONAL INDICES OF CALF BLOOD OF UKRAINIAN BLACK-SPOTTED DAIRY BREED AT EARLY STAGES OF POSTNATAL ONTOGENESE BY THE INFLUENCE OF VITAMIN B6 144

Kalinin I., Melnikova N.
INFLUENCE OF CADMIUM AND LEAD ON THE BIOCHEMICAL INDEXES OF THE POISONED RATS 145

Kaminska M.V., Boretska N.I., Kolisnyk H.V.
ANTIOXIDATIVE DEFENCE IN QUAIL UNDER FEEDING OF CAROTENE-CONTAINING YEASTS *PHAFFIA RHODOZYMA* 145

Kedyo V.
EFFECT OF COX-2 INHIBITOR CELECOXIB ON LIPOPEROXIDATION PROCESSES IN HEART TISSUE AND GASTRIC MUCOSA OF STREPTOZOTOCIN-INDUCED DIABETIC IN RATS 146

Khavrona M., Fartushok N, Khavrona O.
FATTY-ACID LIPIDS COMPOSITION CHANGES IN RAT LIVER IN CASE OF STREPTOSOTOCIN DIABETES 147

Klenov R.O., Klenova N.A.
PEPTIDES GENERATION IN THE HUMAN ERYTHROCYTES AT INCREASING OF ENDOCELLULAR CAMP CONCENTRATION 148

Klymyshin D.O., Myraschenko L.R., Gren T.P., Fedorenko V.O.
INVESTIGATION OF *snogL* GENE, INCODING A PUTATIVE O-METHYLTRANSFERASE, INVOLVED IN NOGALAMYCIN BIOSYNTHESIS IN *STREPTOMYCES NOGALATER* 149

Korolushun T.A., Golovach P.I.
THE PECULIARITIES OF HAEMOCREATION IN YOUNG LIVE-STOCK OF POLISKA BEEF BREED AT THE EARLY STAGES OF POSTNATAL ONTOGENESE 150

Kostyuk I.A.
INFLUENCE OF HIGH DOSES OF VITAMIN E ON RESPIRATORY ACTIVITY OF THE HEN LIVER MITOCHONDRIA BY PROTRACTED RECEIPT IT IN AN ORGANISM 151

Kravenska E., Nalyvayko N., Dubitsky L., Fedirko N.
COMPARATIVE CHARACTERISTICS OF THE MOLECULAR MECHANISMS MEDIATING THE Ca^{2+}-INDUCED MITOCHONDRIAL SWELLING AND Ca^{2+}-INDUCED Ca^{2+}-EFFLUX FROM LIVER MITOCHONDRIA 152

Kuchmenko O.B., Petukhov D.M., Mkhitaryan L.S., Yevstratova I.N.
FREE-RADICAL PEROXIDATION OF PROTEINS UNDER ADRIAMYCIN-INDUCED CARDIOMYOPATHY AND EFFECT OF BIOLOGICALLY ACTIVE SUBSTANCES 153

Kuznetsova V.G, Zhegunov G.F.
INVESTIGATION OF IMMUNOGENIC EFFECT OF CHICKEN EMBRYOS EXTRACTS ON MICE WITH EXPERIMENTAL LEUCOPENIA 154

Lapinskaya E.V., Kudritskaya O.A.
THE ANALYSIS OF INTELLECTUAL WORKING CAPACITY OF STUDENTS WITHIN DAY 155

Lavinskaya E.V., Klimova E.M., Zvyagintseva O.V.
ESTIMATION OF THE CONTENT OF CYTOTOXIC SERUM FACTORS OF PATIENTS WITH AUTOIMMUNE DISORDERS WITH USE OF A CELLULAR BIOSENSOR 156

Liaudanski A.D., Kushniarevich A.I., Sivitskaya L.N.
GSTM1 AND GSTT1 GENETIC POLYMORPHISM IN BELORUSSIANS 157

Martynova S.N., Perskiy E.E.
CONTENTS OF COPPER IN SUBCELLULAR FRACTIONS OF HEPATOCYTES AND NEPHROCYTES OF RATS IN HYPERCOPPEROSIS 158

Mashejko I.V., Kulinich A.A., Maslak A.S., Stekleneva N.I.
OBTAINING AND PROSPECTS OF USAGE OF DEGLYCOSYLATED ANTIBODIES IN CLINICAL DIAGNOSTICS 159

Melnichuk D.O., Melnikova N.M., Klih L.V., Ermishev O.V.
MINERAL COMPOSITION OF LIVER TISSUE OF RATS POISONED BY CESIUM CHLORIDE 160

Melnik A.V.
INFLUENCE OF CYSTEINE AND HOMOCYSTEINE LONG-TIME ADMINISTRATION ON URINARY EXCRETION OF SULFUR-CONTAINING METABOLITES IN RATS 161

Melnikova N.M., Shepelova I.A., Derkach E.A., Motornyuk A.V.
INTENSITY OF CADMIUM ACCUMULATION IN KIDNEYS OF RABBITS 162

Melnikova N.M., Voroshilova N.M.
IMPORTANCE OF AGE ASPECT IN REGULATION OF ACTIVITY OF SOME RAT LIVER ENZYMES 163

Mokrozub V., Babenko L., Voronkova O., Vinnikov A.
EXPERIMENTAL MODEL OF STUDYING A HUMAN'S BODY BIOCENOSIS 164

Morozova K.S.
OPTIMIZATION OF BIOCHEMICAL AND PHOTOCHEMICAL STABILITY OF FAR-RED FLUORESCENT PROTEIN RFP660 165

Mysko M.I., Nykoliuk I.D.
NITROGEN METABOLISM PRODUCTS CONTENT IN TUMORAL RAT BLOOD 166

Obrooch A.V., Lykova O.A., Puzanova V.S., Fylymonenko V.P., Nikitchenko I.V.
THE ACTION OF L-ARGININE AND Zn-PROTOPORHYRIN ON SOME PARAMETERS OF ANTIOXIDANT-PROOXIDANT BALANCE IN RAT TISSUES UNDER EXPERIMENTAL RHABDOMYOLYSIS 166

Opanasenko N.N., Kalitka V.V., Danchenko E.A.
INFLUENCE OF ANTIOXIDATIC FODDER ADDITIVE DISTINOL ON PEROXIDATION OF LIPIDS OF MUSCULAR TISSUE OF GEESE 167

Panova N.E., Zhurova M.A., Okhrimenko S.M.
THE INFLUENCE OF COBALT CHLORIDE AND THE EXTRACT OF GRAPE PITS ON THE PARAMETERS OF STRESS REACTION AND SH-GROUPS CONTENT IN RAT LIVER 168

Parchami Gh.S., Gorenko Z.A., Karbovska L.S., Veselsky S.P.
ANTIDIURETIC HORMONE STIMULATES BILE SECRETION IN ANAESTHETIZED RATS 169

Pasichnaja E.P., Morozova R.P., Donchenko G.V.
CHANGES OF BRAIN LIPID CONTENT AT DIFFERENT STAGES OF DEVELOPMENT OF EXPERIMENTAL ALLERGIC ENCEPHALOMYELITIS 170

Pasternak S.L., Golovatyuk P.S., Chernyavskaya Y.S.
CONTENT OF MALONDIALDEHYDE, ACTIVITY SUPEROXIDE DISMUTASE AND CATALASE IN ORGANS OF IRRADIATED RATS, WHICH RECEIVED *SPIRULINA PLATENSIS* IN DIET 171

Polegaeva N.V., Aleynikova J.J.
BIOCHEMICAL CHANGES IN THE RAT INTERNAL ORGANS WITH THE DEVELOPMENT OF SYSTEMIC INFLAMMATORY RESPONSE SYNDROME 172
Polikarpova A.V., Perskiy E.E.
THE DYNAMICS OF CYTOKINES LEVEL CHANGE IN BLOOD SERUM AND DAMAGE AREA UNDER THERMAL BURNS OF GUINEA PIGS SKIN 173
Ponomarenko A.N., Zhukova T.V.
AGE-RELATED CHANGES IN MAIN BIOPOLYMERS OF THE SKIN AND AORTA OF RATS 174
Postoy R., Shaposhnik V., Karpovskiy V., Krivoruchko D.
SOME INDICATORS OF CARBOHYDRATE AND LIPID METABOLISM IN THE VENOUS BLOOD OF MAMMARY GLAND DEPENDING ON THE TYPE OF THE HIGHER NERVOUS ACTIVITY 175
Raetska Ya.B., Torgalo E.A., Ostapchenko L.I.
BIOCHEMICAL MECHANIZMS OF QUERCETIN INFLUENCE UNDER THE CONDITIONS OF HEMORRHAGE APOPLEXY PROGRESS 176
Rotan' O.Ya., Chuprina I.P., Guryeva A.V., Barannik T.V.
SPECIFIC FEATURES OF OSMOTIC, DETERGENT AND PEROXIDE HEMOLYSIS AFTER FERRIC CHLORIDE ACTION ON ERYTHROCYTES IN VITRO 176
Rovenko B.M., Gospodaryov D.V.
SURVIVAL STRATEGIES OF FRUIT FLY *DROSOPHILA MELANOGASTER* FED BY DIFFERENT CARBOHYDRATE DIETS 177
Savchenko A.V., Onufrienro O.V.
AN EXPERIMENTAL RESEARCH OF THE ACTOPROTECTIVE ACTIVITY OF THE NOVEL TIOBARBITURIC ACID DERIVATIVES 178
Selyukova N.Yu., Karpenko N.A.
SOMATIC AND SEXUAL DEVELOPMENT OF MALE OFFSPRING BORN FROM PHYTOESTROGENIZING FATHERS 179
Skoklyuk L.B., Didenko G.V.
CYTOTOXIC ACTIVITY OF *RAHNELLA AQUATILIS* LIPOPOLYSACCHARIDES 180
Storozhenko G.
EFFECT OF THE C_2-CERAMIDE ON THE CARDIOLIPIN CONTENT IN RAT HEPATOCYTES 181
Strohush N.S., Stapay P.V.
AGE AND SEASONAL FEATURES OF WOOL GROWTH AND LIPID CONTENT IN THE SHEEP SKIN 182
Strotska E.A., Ostapchenko L.I., Romanenko M.S.
MEASUREMENT OF H^+,K^+-ATPASE ACTIVITIES IN PATIENTS WITH OR WITHOUT *HELICOBACTER PYLORI*-ASSOCIATED DUODENAL ULCER 183
Tarkovska A.V., Lyanna O.L., Chorna V.I.
ALTERATIONS OF PROTEOLYSIS DURING FORMATION OF STABLE PATHOLOGICAL BRAIN STATE 183
Ukhachevych M., Kozak G., Khavrona O., Fartushok N.
PEROXIDATION INDEX CHANGES IN RAT LIVER IN CASE OF EXPERIMENTAL DIABETES 184

Vladychko T., Morenko A., Pavlovych O.
ELECTRIC CORTICAL ACTIVITY DURING REALIZATION OF THIN MOTIVE ACTIVITY OF MAN 185
Vodopyanova L.A.
INFLUENCE OF CRYOPRESERVATION ON THE BONE MARROW CELLS OF DOGS 186
Volkova Y.V.
AGE-DEPENDENT PECULIARITIES OF CHANGE IN LOW-MOLECULAR ANTIOXIDANT LEVEL IN RAT BRAIN AND LIVER POSTMITOCHONDRIAL FRACTION UNDER STRESS 187
Vremere V., Godoroja O.
INFLUENCE OF FULL STARVATION ON SEPARATE CURTAILING FACTORS OF BLOOD OF ORGANISM 188
Yuzefovych Y.M., Kovalyova V.A., Serhiychuk A.A., Vyshnevska A.H., Ostapchenko L.I.
RAT STOMACH MUCOSA CELLS LIPID COMPOSITION UNDER STRESS ULCER MODEL 189
Zabirnik A.S., Panibrattseva S.G.
COMPARATIVE CHARACTERIZATION AND NEURONAL DIFFERENTIATION OF BONE MARROW STROMAL CELLS AND ADIPOSE TISSUE-DERIVED MESENCHYMAL STEM CELLS 190
Ziablitsev D.S., Sergeeva D.S., Piskureva A.V.
ABNORMALITIES OF ALIMENTARY ORIGIN IN CHILDREN OF DONETSK AND THEIR PREVENTION 191
Zvyagintseva O.V., Klimova E.M., Lavinskaya E.V.
CHANGES OF PROTEIN- FRACTION RATIO OF THE EXPERIMENTAL ANIMALS AFTER THEIR IMMUNIZATION BY THE PATIENT BLOOD SERUM CONTAINING CYTOTOXIC FACTORS 192
Contents. 194

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