ABSTRACT&REFERENCES

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FUNCTIONAL STATUS OF PITUITARY-OVARIAN SYSTEM IN MATURE RATS UNDER LONG-TERM IMPACT OF HEAVY METALS AND NON-HORMONAL CORRECTION

p. 4-7

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Aim *of the research is the study of functional features of the pituitary-ovarian system of female rats under the long-term influence of the combination of low doses of salts of heavy metals and non-hormonal correction by vitamin E.*

Materials and methods. *The experimental study was carried out on 30 white mature female rats with the mass 200–230 g, age 5–7 months that during 30, 60 and 90 days respectively underwent the microelementosis modeling. The animals received ordinary drinking water, saturated with the combination of salts of heavy metals: zinc (ZnSO4·7H2O) – 5 mg/l, copper (CuSO4·5H2O) – 1 mg/l, iron (FeSO4) – 10 mg/l, manganese (MnSO4·5H2O) – 0,1 mg/l, lead (Pb(NO3)2) – 0,1 mg/l and chrome (K2Cr2O7) – 0,1 mg/l. The correction of revealed reconstructions in the pituitary-ovarian system was carried out using the non-hormonal corrector, vitamin E. The method of immune-enzyme method of the study (automatic chemiluminescent immune analysis) with the determination of luteinizing, follicles-stimulating hormones, progesterone, estradiol in peripheral blood serum of the studied animals was used.*

Results of research. *The functional state of the hypophysis and ovary underwent functional reconstructions in the context of the course of general adaptive syndrome that has a certain dynamics of secretory changes and phases. The level of luteinizing hormone in blood serum of intact rats and experimental animals on 30, 60 and 90-the day of the experiment remained practically stable and was <0,1 mIUn/ml. FSH concentration on 30 day in the rat organism increased in 2,09 times (p≥0,05), but at all following terms FSH level decreases to the indices of control animals. Progesterone level on 30-th and 60-th day of the experiment dynamically decreased, respectively in 2 times (p<0,001, t=13,77418) and in 2,44 times (p<0,001, t=9,838906) comparing with the control. On 90 day of the experiment progesterone content in blood serum of rats remains less that the indices of control animals in 1,2 times (p<0,001, t=3,731171). Salts of heavy metals have the negative influence on estradiol secretion by ovary. On 30-th and 60-th day of the experiment estradiol level decreases comparing with the indices of control animals in 3,44 times (p<0,001, t=75,43049). On 90-the day estradiol level increases in 1,34 times (p<0,001, t=10,0) comparing with the indices of animals of 60 day term of the experiment, remains less than the indices of control animals in 2,56 times (p<0,001, t=44,41311). The use of vitamin E as a corrector positively influences the pituitary-ovary system. There is observed the increase of LH amount, circulating in blood by 41 %, and progesterone in 1,46 times comparing with the indices of control animals.*

Conclusions. *Salts of heavy metals cause the complex of negative changes, that lead to essential functional disorders in the adenohypophysis and ovary of mature rats. The revealed reconstructions are in the direct dependence on the experiment terms, are characterized by the phased course of the general adaptive syndrome and deep imbalance in the work of the pituitary-ovary system. Antioxidant L-tocopherol revealed the reliable stress-protective effect on the course of the second phase of the estral cycle of mature female rats*

Keywords: *adenohypophysis, ovary, follicles-stimulating hormone, progesterone, estradiol, luteinizing hormone, heavy metals*

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CHANGING OF NEEDLES LAMINA OF PINUS L. SPECIES UPON BIOTIC FACTORS INFLUENCE

p. 7-11

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Aim *– to establish changes on the surface of needles affected by insects and infected pathogens, to show its differences from healthy needles and establish appropriate patterns.*

Methods. *Application of clear varnish on the surface of the needles with subsequent separation from reflection by adhesive tape. Further, the material was recorded with a light microscope equipped with a digital camera.*

Result*. It was found that the number of rows of stomata on the surface of needles varies depending on the nature of the effect factor. Differences are also important at the juvenile and generative stage. There is a difference between the number of stomata on the outer and inner sides of the needle, and also the relationship between them.*

Conclusions. *Based on this experience, it can be said that the morphology of the surface device of annual pine needles can serve as an indicator in determining the nature of biological damage to pine at different stages of development. The results also play an important role in understanding the mechanisms for protecting pine from pests and pathogens, and in developing a common adaptive strategy in plants*

Keywords: *Pinus L., needle surface, adaptation processes, surface needle response*

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THE EVALUATION OF ONTOGENETIC AND VITALITY STRUCTURES OF *SCILLA BIFOLIA* L. COENOPOPULATIONS ON THE TERRITORY OF SUMY GEOBOTANICAL REGION

p. 12-17

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Aim: *to establish typical features of ontogenetic and vitality structures of Scilla bifolia coenopopulations in different phytocenoses in the Sumy geobotanical region, to evaluate the dynamics of these structure types in the period 2015–2016 years.*

Methods: *Common geobotanical methods were used at the research. For the determination of ontogenetic spectrums of Scilla bifolia cenopopulations was used ANONS 6 non-commercial program, and for the determination of vitality spectrums and quality types of coenopopulations was used VITAL non-commercial program, elaborated by Y.A. Zlobin.*

Result: *ontogenetic spectrums of all studied Scilla bifolia coenopopulations are bimodal by the one peak on juvenile or immature individuals and the other peak on young generative individuals. According to T.O. Rabotnov classification, all coenopopulations in 2015 were invasive, and in 2016 P1 and P2 remained invasive and P3 became normal. According to L.O. Zhukova classification, all Scilla bifolia coenopopulations in both 2015 and 2016 represented the normal group, and according to L.V. Zhyvotovsky classification, they are all young, because Δ/ω ratio for the period of researches in Scilla bifolia coenopopulations corresponded to the diapason from 0,06/0,20 to 0,18/0,52.*

As to the vitality analysis of Scilla bifolia coenopopulations, two qualitative types of this variety coenopopulations are presented: prospering and balanced.

The common feature of the vitality structure of all coenopopulations Scilla bifolia is rather low (up to 13 %) part of individuals of the mean («b») vitality class. For coenopopulations P1 and P3 during two years is typical the predominance of high vitality (class «a») individuals.

Conclusions: *within the Sumy geobotanical region the typical feature of Scilla bifolia coenopopulations is similar ontogenetic spectrums. Active renewal processes and intensive introduction in forest groups are inherent to them.*

Vitality structure of Scilla bifolia coenopopulations changes at the transfer from one phytocenosis to another. It is an evidence of realization of the ability to adaptation and to adjustment to growth conditions

Keywords: *Scilla bifolia, coenopopulations, ontogenetic structure, vitality structure, Sumy geobotanic region*

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ENVIRONMENTAL ASSESSMENT OF THE STATE OF ATMOSPHERIC AIR IN CONDITIONS OF DIFFERENT TECHNOLOGIES OF POULTRY PRODUCTION

p. 18-21

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Aim of research *– the integral environmental assessment of atmospheric air pollution with hydrogen sulfide, nitrogen and sulfur oxides in zones of the intensive poultry farming and egg production.*

Materials and methods. *The research was carried out in zones of location of poultry enterprises of broiler and egg production by variants:*

1. SPZ (sanitary-protection zone) – 50 m from poultry yards;
2. OD – 1 (observation district) 500 m beyond SPZ;
3. OD – 2 (observation district) 1700 m beyond SPZ;
4. Control 10 km from poultry enterprises.

Poultry enterprises are situated in Kyiv region in identical soil-climate conditions. The analysis of the content of aeropollutants NO_2,SO_2, H_2S in atmospheric air was realized using the gas analyzer 604-342EH07-02 ("KSM – 05" LTD, 2013).

Results of research and their discussion*. The results of the quantitative analysis of mean indices of physical-chemical analysis of NO_2, SO_2, H_2S content for 2014–2016 were received. The content of NO_2,, H_2S in atmospheric testifies to the stable tendency to the exceed of the mean maximum allowable concentration ($MAC_{m.d.}$) and maximal one-time allowable concentration (MAC max), except the control AC. For the integral environmental assessment of the state of air environment in zones of industrial poultry farming was offered the index of atmosphere pollution (IAP) and the complex index of atmosphere air pollution (C_{iap}). For eggs production ΣIAP may be set in such a way in order to decrease: $H_2S(7,94)\geq NO_2(6,69)\geq SO_2(6,43)$. In zones of boiler production the other tendency of Σ IAP change is observed: $SO_2(26,62)\geq NO_2(11,31)\geq H_2S(6,01)$.*

***Conclusions**. Thus, the important and necessary condition for eco-friendly poultry farming is a system control of the state of atmospheric air and the content of priority and dangerous aeropollutants in zones of powerful poultry enterprises location. The use of IAP and C_{iap} is most optimal for the integrated environmental assessment of atmospheric air pollution with aerogenic pollutants*

***Keywords:** environmental assessment, poultry farming, atmospheric air, pollution, nitrogen, sulfur oxides, hydrogen sulfide*

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ANALYSIS OF PSAMOPHYTIC COMPLEX OF THE NATIONAL PARK «BILOBEREZHZHYA SVYATOSLAVA»

p. 22-26

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***Aim of research** – the comprehensive analysis of the complicated psamophytic complex of the national park "Biloberezhzhya Svyatoslava".*

Object of research – types of the psamophytic complex of the national park "Biloberezhzhya Svyatoslava".

The following tasks were set for attaining this aim:

– to study: the geographical structure: by zonal, regional and oceanic horologic groups;

– biomorphological structure: by the big life cycle duration, by the root system type, by surface sprouts type, by vegetation type;

– ecological structure: climamorphes, geliomorphes, hygromorphes, thermomorphes;

– to elucidate features of the direction and anthropogenic transformation degree of the psamophytic ecocenophyton of the national natural park "Biloberezhzhya Svyatoslava".

***Methods.** The material was collections of psamophytic plants of flora of the national natural park "Biloberezhzhya Svyatoslava", revealed at detail-route investigations. There were used cameral methods – herbaria material processing and mathematical statistics methods. To reveal ecophytons' similar features there was realized the comparison of the taxonomic compositions of studied territories by the Stugren-Radolescu coefficient.*

For the detail study of features of psamophytic ecocenophyton anthropogenic transformation were used indices (parameters), offered by B. Jackowiak in 1990 that indicate the percent participation of groups by their relation to antropopression in flora or its separate elements.

***Results and conclusions**. In the systematic spectrum the psamophytic florocomplex is characterized by the essential heterogeneity in both family and generic spectrums.*

In the geographical spectrum in the zonal spectrum prevails the submeridional horologic group, in the regional spectrum – ancient Mediterranean, Eurasian and circumpolar, in the oceanic spectrum – indifferent one.

The feature of the psamophyton biomorphological structure is the prevalence of herbal monocarpic plants by the big life cycle duration, types with the core root system – by the root system type, semi-rosette and non-rosette – by surface sprouts type, summer green species – by vegetation type.

In the psamophyton ecological structure prevailed: by climatomophes– terrophytes and hemicryprophytes, by geliomorphes – gelophytes, by hygromorphes – xeromesophytes and mesopytes, by thermomorphes – mesothermophytes.

Almost all indices, except PS, CS, Pap, Fap, PapS that indicate the degree and direction of anthropogenic transformation of the psamophytic complex of studied flora are essentially lower than correspondent parameters for other psamophytic complexes and protected territories in whole. But they were higher than ones for the national natural park "Biloberezhzhya Svyatoslava" flora in general. Apophytization prevails over anthropophytization in the process of flora synantropization.

The relatively high synantropization index proves that the psamophytic complex of the national natural park "Biloberezhzhya Svyatoslava" flora belongs to territories with the high degree of anthropogenic of flora. The high indices of anthropophytization, kenophytization and modernization, apophytization of the flora psamophytic complex comparing with other territories determines the synantropization specificity of the psamophytic complex of the national natural park "Biloberezhzhya Svyatoslava"

flora that is in the prevalence of apophytization process over adventization

Keywords: *psamophytic complex, National natural park, anthropogenic transformation, kenophytization, archeophytization indices*

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OPTIMIZATION OF SOME ELEMENTS OF CULTIVATION TECHNOLOGY OF ORNAMENTALS IN THE NORTH-EASTERN PART OF FOREST-STEPPE OF UKRAINE

p. 27-33

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Aim *of the experiment was to study factors influencing on effectiveness of the root formation in cuttings of ornamental plants (Buxus sempervirens L., Thuja occidentalis L.).*

Methods. *The experiment was conducted in a nursery at the Sumy National Agrarian University, Ukraine in 2013–2015. The types and mixtures of rooting media and rooting hormones were used, and terms of plant cutting under mist were analyzed.*

Results. *It has been found that the best substrate for rooting cuttings of these species was a mixture of peat DOMOFLOR (pH 6.0) and sand in the ratio 1:1. It has been revealed that its acidity and the optimum time for plant cutting are important components of cultivation technology of plant propagation material. B. sempervirens is proved to be successfully propagated from April to August, and cuttings T. occidentalis – in April. There has been grounded the appropriateness of Rhizopon AA powder for rooting stem cuttings T. occidentalis.*

Conclusion. *The best media for rooting cuttings of ornamental species with the closed root system included peat, sand and humus in the ratio of 1:1:0.5. It set up the effect of using the rooting hormone (Rhizopon AA poeder); propagation of shrub ornamentals: B. sempervirens is more expediently from April to August by stem cuttings, T. occidentalis – in April*

Keywords: *Buxus sempervirens, Thuja occidentalis, growth regulators, cutting, Rhizopon, fumar, rooting*

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DEPENDENCE OF *DITYLENCHUS DESTRUCTOR* THORNE POPULATION DENSITY FROM SOIL HUMIDITY AND TEMPERATURE IN THE NORTH-EAST OF UKRAINE

p. 33-36

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Aim. *The aim of the study – to establish the parasitical activity of Ditylenchus destructor Thorne depending on abiotic factors under conditions of the Northern East of Ukraine.*

Methods. *The studies were carried out in artificially controlled conditions of the temperature and humidity. The microscopic analysis was used.*

Results. *It was established, that the parasitological activity of caulescent nematodes causes the injury of potato and determines the degree of its harmfulness in Northern-Eastern regions of Ukraine. There was studied the influence of two abiotic factors – temperature and humidity on the development of these nematodes. Just they are important limiting ecological factors of the increase of зpopulation density and aggressiveness of the species under conditions of the Northern East of Ukraine.*

Conclusions. *With the increase of the soil humidity from 40 to 80 % grows the number of injured stems and tubers of potato. They are less changed at the low soil temperature. The maximal potato injury was at the morning temperature 17–20 °C and day one 20–24 °C. The established correlative-regressive dependencies may be used at the elaboration of prognoses of the development and arrangement at fighting against this vermin on potato crops*

Keywords: *Ditylenchus destructor, population density, temperature, humidity, abiotic factors, correlations, regression*

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GENERAL CHARACTERISTICS OF HYDROCARBON OXIDAZING MICROORGANISMS ALLOCATED FROM OIL-POLLUTED SOILS OF AZERBAIJAN

p. 37-41

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Aim of research *– the study of microorganisms of different oil-polluted soils (OPS) of Azerbaijan.*

Methods of research. *The objects of the research were samples of soils from two studied deposits: Naftalan and apsheron ones – Bibi-Eibat and Binagadi. The quantitative account of microorganisms was carried out by the method of limit dilutions. The conversion degree was determined by the weight method.*

Results of research. *The results of the realized researches demonstrated that among 108 isolated fungal strains, 69 were isolated from oil-polluted Apsheron soils, 21 strains – from Naftalan oil deposits, 14 strains – from Naftalan oil, 4 strains – from used Naftalan oil. It was revealed that Penicillium sp.3n strain, isolated from Naftalan oil deposit soils, is most active.*

Conclusions. *The isolation of more quantity of hydrocarbon oxidizing microorganisms (especially fungi) from soils of Binagadin oil deposits is explained by the presence of the large number of n-alkanes in its content. The results of conversion of Naftalan oil and its fractions by isolated active strains give a ground to suppose that the prevailing activity of Penicillium sp.3n strain is connected with its substrate specific properties*

Keywords: *microorganisms, oil, hydrocarbons, oil-polluted soil, micromycetes, oil fractions, conversion*

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