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*Acad. M. Popov*  
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**S02-27 INFLUENCE OF CHRONIC IRRADIATION ON ISSURE NON-REPAIRABLE DNA DAMAGES IN PINE SEEDS WERE FORMED IN CHERNOBIL EXCLUSION ZONE**

*S. Isaenko, B. Sorochinsky*

*Institute of Cell Biology and Genetic Engineering, Ukrainian Academy of Sciences, 148 Zabolotnogo Str., Kiev, DSP-22, Ukraine*

The aim of this studies are investigate the level of DNA damages of pine seeds which have been formed in conditions of chronic  $\gamma$ -irradiation. Seeds samples were collected from pine trees of the different parts of Chernobyl zone. It is important to know the quality of seeds because pine trees are the most important species used for new forest planting. Seeds have been germinated for 10 days and protoplasts from shoots were isolated. The protoplasts were also exposed to additional external irradiation followed by DNA was analyzed with pulsed-field electrophoresis and hydroxyapatite chromatography. DNA damages have been monitored after different time intervals between irradiation and cell lysis in order to analyze the efficiency of the DNA repair systems. The analysis has revealed a non-linear dose-dependent effects. Seeds have irradiated with dose of 0.03 Gy were more susceptible to the DNA damage than seeds irradiated with 3 Gy of chronic irradiation. The investigation of the DNA degradation kinetics has shown that 4 hours were enough to completely repair the damage caused by an additional sublethal irradiation dose (40 Gy) of protoplasts derived from seeds absorbed 3 Gy of chronic irradiation.

**S02-28 THE INFLUENCE OF BIOLOGICAL ACTIVE SUBSTANCES MAMMALS ORIGINE ON GROWTH CHARACTER OF SOME CULTURAL SPECIES (SEEDLINGS)**

*L. Yu. Gorbatenko, S. V. Poleschchuk, L. L. Volkova, L. V. Kravchenko, D. V. Protsenko, E. E. Grushevenko*

*State Pedagogical Institute of Kherson, Central Post-Office, box 13, 325000, Ukraine*

The chemical structures of floral and faunal biological active substances (BAS): hormones, vitamins, antioxidants are closed. Till now the influence of mammals BAS plant organism ontogenesis is not studied. The aim of our experiments was to study influence of different concentrations of mammals hormone, hydrocortizone (H), and antioxidant, lipoic acid (LA), on the biometric indices of seedlings of barley (*Hordeum vulgare*, cv. Yuzhniy), winter wheat (*Triticum aestivum*, cv. Khersonskaya) and tomato (*Lycopersicon esculentum* Mill., cv. Novichok). Our results showed that the effect of BAS depended of concentration and concrete culture. H at concentration 0.0005–50 mg/l increased wheat seedlings weight on 11.6–15.7% and shoot length on 10.3–13.8%, but at concentration H 500 mg/l all analysed indices were decreased. In whole LA stimulated barley and tomato seedlings growth, but inhibition of barley seed germination was observed. Further investigations in this problem will open similitude of floral and faunal BAS effects on metabolism, ontogeny, morphogenesis etc.

## S15-25 GROWTH REGULATING EFFECT OF LACTOSE OLIGOSACCHARINES (OS)

L. L. Volkova, I. Yu. Gorbatenko

Kherson Department, Institute of Agricultural Biotechnology, Central Post-Office, Box 13, 325000 Kherson, Ukraine

OS attract an active attention of scientists, because they fulfil an exclusive functions of molecules mediators in intracellular communications, regulate morphogenesis processes and ontogeny of eukariots and especially immunity status of organism under contacts "plant-pathogen". Our purpose of investigations was to determine influence of mammallians origine OS (from female milk) on such indices as plant weight, shoot and root length of tomato (*Lycopersicon esculentum* Mill., cv. Novlechok) and winter wheat (*Triticum aestivum*, cv. Khersonskaya) seedlings. Wetted in OS solutions seeds were germinated on Knopp medium. OS were received in Nesmeyanov Institute of Element Organic Compounds RAS. We used following concentrations of OS:  $10^{-21}$  -  $10^{-5}$  mol/l with step 0.01 mol/l. The results showed differences on biological activity of studied OS. Winter wheat seedlings were more sensitive to OS treatment (all studied characters except germination increased control on 10-25%). In tomato seedlings the degree germination increased on 10-15% and only some of OS stimulated seedlings growth. According to our results and literature references we conclude that the OS (as faunal and floral origine) has analogical effects on early ontogeny of plants. We suppose that biological activity of OS in great degree depends on object and OS structure. Fucose containing OS influence more positively on plant organism than OS without fucose residue.

## S15-26 THE CORRELATION BETWEEN EAR GROWTH, PHOTOSYNTHATE PARTITIONING AND ENDOGENIOUS PHYTOHORMONS IN BARLEY DURING ONTOGENESIS.

I. Kiselyova

The Urals State University, 51 Lenin av., 620083 Ekaterinburg, Russia

Ear growth in barley was studied in relation to it's sink-activity and source-activity of leaves, transport of photosynthates, their utilization and hormonal status. C14-partitioning between leaves and ear in a day after leaf labeling was used to characterize the source activity of leaves and ear sink-activity, that was also studied by the uptake of C14-glucose in detached ears of different age. The content of endogenous IAA, ABA and cytokinine was determined by ELISA. It was shown, that barley ear is characterized by different sink strength with age. The most high uptake of leaf photosynthates and C14-glucose was revealed during stoeing (I) and milk ripeness of barley kernel (II). Stage (I) was characterized by the formation and growth of structural elements of the ear. Photosynthates and C14glucose were incorporated at that period mainly to cellulose and hemicellulose.

During stage (II), when the kernel grew intensively, leaf photosynthates and C14-glucose were used for starch and protein synthesis. These stages were characterized by the high growth rate (34 mg/day for I and 65-70 mg/day for II) and 2 peaks of zeatin concentration (10 ng/g dry matter for I and 23 ng/g for II). The content of other studied phytohormones and their ratio also differed during ontogenesis: maximal concentration of IAA was 8.8 mg/g during stage I and ABA - during stage II (6.7 mg/g).

The final stages of kernel ripening were characterized by the decrease of ABA concentration. We suggest that the high attractive activity and fast growth of the ear in stages I and II were stipulated by its specific hormonal status, that determined the demand for photosynthesis in leaves, photosynthate partitioning and metabolism.