

CHANGES OF WHEAT SEEDLINGS NUCLEI ELECTROMOBILITY UNDER INFLUENCE OF MM-WAVES

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In the work zeta-potential of wheat seedlings intact nuclei under impact of ionizing and non-ionizing irradiation have been studied, which is take us advanced to investigate nature of influence on the charged nuclear surface. Zeta potential has a major effect on the various properties of nano-drug delivery systems [1]. The intact nuclei distriected by the porous nuclear membrane, composed of zwitterionic and anionic phospholipids have an electrokinetic potential in the interfacial double layer on nuclear membrane surface [2]. The negative charge of anionic phospholipids distributed over the surface of nuclei plays an important role in the formation of electrokinetic potential, regulation of nuclear membrane processes, permeability and also in the processes of interaction of nuclei with external influences including mm-wave and γ -irradiation.

In the study shown decreasing of surface negative charge due to anionic PL under the influence of mm-wave, which while led to the elevation of electrokinetic potential (EKP) of intact nuclei in the electric field gradient (Fig. 1).

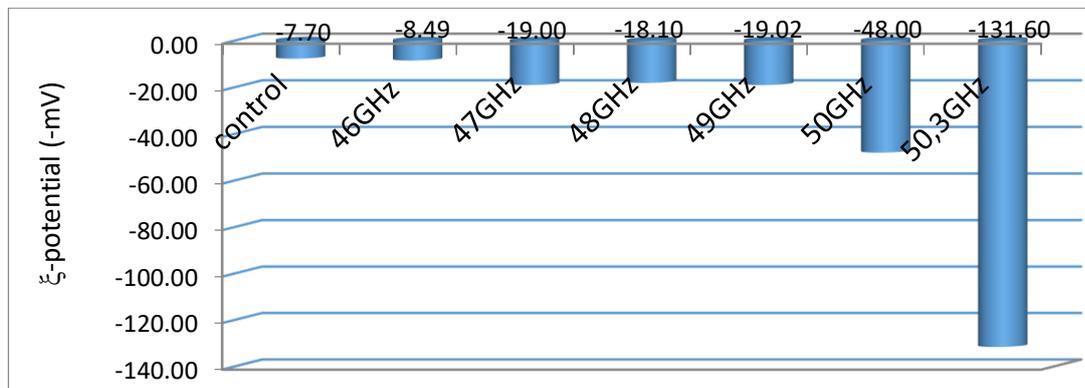


Fig.1 The changes in ξ -potential of 4-day seedlings nuclei dependence from EHF EMI *in vivo* treatments.

Thus, revealed increasing of EKP of wheat seedlings intact nuclei under impact of mm-wave compare to control seedlings and seeds treated by γ -irradiation. Contrary to influence of EHF EMI, γ -irradiation can impact nuclei till to destroy nuclear membrane, which in result led to decreasing of EKP value as presented on Fig. 2.

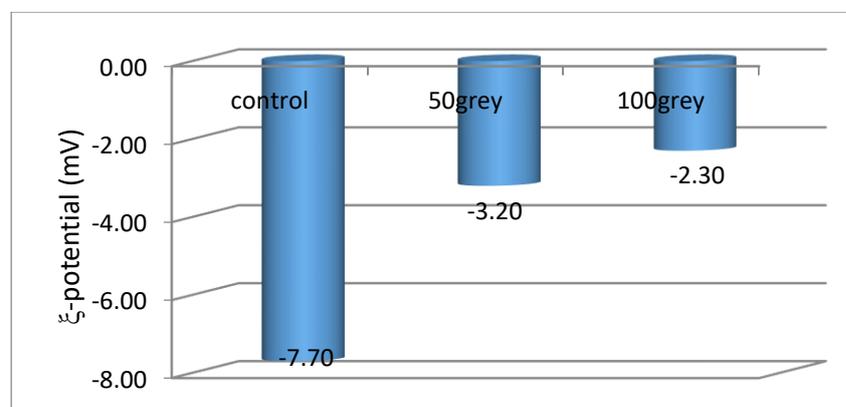


Fig.2 Suppression of ξ -potential of wheat seedlings intact nuclei at the impact by different dose of γ -irradiation.

The comparative investigation has shown big differences between nuclei treated *in vivo* and *in vitro* conditions. It was revealed that under the influence of EHF EMI ξ – potential of intact nuclei separated from pretreated seedlings (*in vivo* variant) led to sharply increase of absolute value of EKP compared to nuclei, treated in solution (*in vitro* variant) and displaying by slightly rise of EKP. We discuss possibility of such modulation by changing in a potential difference between the outer and inner surfaces of the nuclei formed due to the difference in content between anionic phospholipids of nuclear envelope and matrix, which leads to the changes in nuclear membrane surface charges and so formation more compact outer interfacial double layer.

References

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