Radioprotective Activity of Complexes of Iron

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Researches spent in the field of biocoordination chemistry are based on the use of the model biologically active molecules containing functional groups, characteristic for biological systems. It is known, that vital metals are mainly in the form of coordination connections in an organism. During influence of various stressful factors, including ionizing radiation permeability of cellular membrane changes, which leads to dysfunction of metalloenzymes. Therefore exogenous complexes are in a sense irreplaceable additional sources maintenance of organisms (including plant) with microelements - metals. There are significant amount of works, testifying interaction of complexes of metals with free radicals. It is shown, that complexes serve as traps of the free radicals, collecting in an organism, transforming them into non radical products. Presence of organic ligand gives lipophily to metallocomplexes and as a result their transport through the cellular membrane is strongly facilitated. Reasoning from the above-stated, creation of new biologically active preparations on the basis of coordination connections of the metals containing various organic ligands, including natural, is actual. Use of iron as a radioprotector is connected with its ability to complexing. The task of our researches was studying action of gamma irradiation on biosynthesis of chlorophylls and carotinoids, on an output of chromosomal aberrations at anaphase cells of root fibrils of wheat sprouts at use of complexes of iron with the purpose of revealing their radioprotective properties. As the object of researches were taken seeds of a drought-resistant sort of hard wheat Triticum durum L. Seeds were subjected to general proportional gamma irradiation from a source 60Co on gamma-installation "Ê-25" at the doze of 47,83 rad/sec. Before an irradiation seeds had been processed with solutions of pirocatechine, pirocatechinate of iron, thiocarbamide, thiocarbamide of iron, rutin and rutinate of iron in concentration of 10-2 M. Among the used complexes the most effective were pirocatechinate of iron, rutinate of iron which promoted significant reduction of chromosomal aberrations. It is necessary to note, that radioprotective ability of pirocatechinate of iron and rutinate of iron is also found out at processing seeds after an irradiation. It is revealed, that pirocatechinate and rutinate iron possess more expressed radioprotective properties and processing of seeds of hard wheat by solutions of these complexes stimulate formation of photosynthetic apparatus and considerably reduce number of chromosomal aberrations at an irradiation.

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