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PAPER TITLE Plausible molecular mechanisms of morphological abnormalities in coniferous species after Chornobyl accident

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ABSTRACT (See instructions overleaf)

A lot of territories was contaminated with radionuclides (mostly ^{90}Sr and ^{137}Cs) after Chornobyl accident. The level of external γ-radiation in the Chornobyl region is from 1 to 40 mR/h at different lots. Some coniferous species (pine and spruce) form many different morphological abnormalities under these conditions of chronic irradiation. The changeability of needles' length during some vegetation periods is one of them. So, pine needles become essentially shorter (2-3 fold) in some years. Spruce trees have both lengthened and shortened needles as well as needles with normal length on the same tree. It was shown previously that the size of cells in abnormal needles is also different from the normal one. Since the cell size is closely connected to cytoskeleton functions so it was supposed that ammount of cytoskeleton proteins in modified cells must be different from the normal one. Such difference can be caused by changes in synthesis of cytoskeleton proteins as well as by changes in cell genome. Significant changes in protein spectrum and in individual proteins (actin, α- and β-tubulin, hsp70 etc.) were registered with immunochamistry and SDS-PAGE. With the aim to study genome of modified cells, DNA from them was examined with restriction fragment length polymorphism method, dot- and Southern-hybridization with β-tubulin gene. Some changes in DNA from abnormal needles were observed. It was supposed, that chronic irradiation could affect the genome stability of coniferous plants.