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THE IMPACT OF THE ANTARCTIC STRESSFUL CONDITIONS ON HUMAN GENOME STABILITY

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The level of genome instability is an informative parameter of influence of damaging factor on genome in stressful conditions. High level of genome instability is marker of increased risk of cancer.

We studied the level of genome instability of Ukrainian overwinterers in Antarctica before and after 6 and 7 Ukrainian Antarctic Expeditions. To evaluate genome instability the analysis of the level of chromosome abnormalities in lymphocytes of peripheral blood and the rate of micronuclei in smears of exfoliated buccal cells were carried out. Frequency of metaphases with chromosome aberrations (AM), level of chromosome aberration (ChA), frequency of metaphases with premature centromere division (PCD), levels of PCD and total PCD, rate of polyploid mitosis and the rate of micronuclei (MF) were selected as parameters of genome instability.

The differences of genome instability level before and after expeditions were statistically significant only for PCD. Frequency of PCD decreased from 2.02±0.57% before to 0.95±0.25% after expeditions (p<0.01). The average rate of AM was 1.67±0.27% before and 2.35±0.30% after expeditions. The average rate of ChA was 1.86±0.35% before and 2.52±0.36% after expeditions. The average level of MF before expeditions was 3.86±0.34‰ and after expeditions was 4.20±0.31‰. These differences are statistically insignificant but some increasing tendency is observed. The peculiarities of genome instability of each expedition and individual features of winterers' genome instability and it's changing during wintering are discussed.