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Effect of Royal Jelly on Antioxidant Enzymes and ATPase Activity of *C.guilliermondii* NP-4 Yeast Exposed to X-Ray Radiation

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ABSTRACT

Currently, the development of means of protection against of ionizing radiation is extremely relevant.The aim of the work was to clarify the changes in antioxidant enzymes, polyphosphate nucleotide deamination and ATPase activity in yeasts *Candida guilliermondii* NP-4 exposed to X-irradiation and the effect of royal Jelly (RJ) on these processes as a possible radioprotective agent. The obtained data indicate that during X-irradiation and subsequent repair in yeast cell homogenates, H^+-ATPase activity increases by 3 and 2 times, respectively, and in mitochondria by 1.4 and 1.7 times, which is more pronounced in the presence of RJ due to the increased energy demand in the repairing cells. At the same time, the catabolism of purine and pyrimidine nucleotides decreases, which begin to be used as an additional source of energy. X-irradiation induces oxidative stress in yeast cells, as a result of which the activity of antioxidant enzymes SOD and catalase is stimulated as a protective mechanism, which is facilitated by the presence of RJ. Thus, in the presencein the yeast growth medium of RJ, the SOD activity is stimulated by 35%, catalase activity by 46%, and peroxidase activity is almost unchanged. It is likely that the biologically active compounds of RJ contribute to the increase in the activity of antioxidant enzymes during the repair process and the attenuation of oxidative stress. The results obtained can be used to create protective measures against the effects of X-ray irradiation in living organisms.

Keywords: X-radiation, yeast, Royal Jelly, ATPase activity, SOD, catalase peroxidase

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