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RESVERATROL EFFECT ON THE MITOCHONDRIA OF PEA SEEDLING UNDER STRESSFUL CONDITION. ATOMIC FORCE MICROSCOPY AND FLUORESCENCE DATE

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We studied the possibility of using natural polyphenol – resveratrol as an adaptogen on the model of pea seedlings mitochondria by Atomic force microscopy and fluorescence methods. Lipid peroxidation (POL) of isolated mitochondria activated after its Incubation in a hypotonic medium “aging” mitochondria. The fluorescence intensity of the products increased by 2 times compared with the control. The volumes of mitochondria (AFM images) increased by 1.4 times in medium and large fractions. The drug (10^{-6} M) reduced the fluorescence intensity of the POL products to almost control values, and also prevented mitochondrial swelling. The protective properties of resveratrol (3×10^{-4} M) were also investigated at growing pea seeding under conditions of 2-days water deficiency. This led to the swelling of the mitochondria (medium and large subpopulations) of 5-day-old pea seedlings and the inhibition of the biogenesis of these organelles (the absence of small mitochondria), as well as an increase in lipid peroxidation. Pretreatment of pea seeds with 3×10^{-4} M resveratrol reduced the number of swollen mitochondria under water deficiency conditions (by 15%) and activated the biogenesis of these organelles, as well as normalized POL. So, resveratrol prevented mitochondrial swelling and contributed to the preservation of their functional state under stressful conditions. It is assumed that the protective effect of the investigational drug is due to its antioxidant properties and decrease in ROS generation. The method of AFM can be used in the study of the protective properties of biologically active substances.

Keywords: mitochondria, resveratrol, atomic force microscopy, lipid peroxidation