



The estimation of antistress properties of peat degradation products

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Introduction. It is known that polyphenol preparations, produced from peat, represent adaptogens, immunomodulators and can participate in regulation of genetic informational realization as triggers of nonspecific nature. These compounds promote launching of protein-synthesizing system that is very important under unfavorable influence on organism. The experimental data of last years confirmed doth therapeutic value of humic acids as adaptogenes and their antioxidant, anti-inflammatory, antimutogenic, radioprotective and other properties. Lysosomes take the key positions in many physiological and pathological processes of organism owing to their unique structural-functional properties, reactivity and plasticity. These organelles take especial meaning in increased functional activity under stress factors influence. In this way lysosomes become modulators of intracellular processes. It is known that under chronic stress, the systems of neurohumoral regulation and adaptation gradually run out, the function of brain cellular membrane structures disturbs. Understanding of stress developing mechanisms is necessary condition for means development of operative avoiding of the harmful consequences.

Purpose. The aim of the work was to investigate corrective influence of hydrohumates on compartmentalization changing of lysosomal cysteine cathepsin H (EC 3.4.22.16) in different rat brain structures.

The experiment was held on Wistar's rats (160-200 g weight) which were divided into 4 groups: 1 – the control group; 2 – the animals which were received the hydrohumate with water (10 mg hydrohumate (0,1% solution) per 1 kg of weight) during 3 weeks; 3 – the group of stressed rats (test "forced swimming" for 2 hours); 4 – the stressed rats which received the hydrohumate. The activity of lysosomal cysteine cathepsin H was determined spectrophotometrically by hydrolysis of 2-naphthyl-amid L-leucine (Koch-Light Lab., England). It was found out that intracellular compartmentalization changes of lysosomal cysteine protease (cathepsin H) occur as a result of increasing its free activity in 1,6 times in neocortex and 1,8 times in cerebellum, which testify to stress-induced disruption of architectonics and stability of brain cellular lysosomal membranes. These changes could be considered as important biochemical indicators of chronic stress severity. Besides, they could be interpreted as trigger switching over to another functional condition, when power of system reparation becomes not enough for effective removal of disorders.

Conclusions. The hydrohumates make corrective action on activity indices of researched enzymes by decreasing it on 45%. Such influence testifies to its membranotropic properties. It could be suggested that hydrohumates stimulate the reparative processes because of its high antioxidant activity and levels sharp fluctuation of physiological state.