

***Hericium erinaceus* (Bull.: Fr.) Pers. Extract Effect on Nerve Cells**

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It is known that *Hericium erinaceus* (Bull.: Fr.) Pers. (yamabushitake) is a good cultivated edible as well as medicinal mushroom. Its components are often used for the treatment of oncological and vegetative nervous system diseases. But the neurotropic action of extracts of this mushroom still have not been investigated. The purpose of the present study is to investigate the action of the extracts on nerve cell spike activity and morphological parameters during their growth in nutritive medium prepared from the extracts.

Spike reactions of 81 neurons from the hippocampal CA1 pyramidal layer of rat brain slices to the application of *H. erinaceus* fruiting body extract were studied. Slices 400 μ m thick were placed in the experimental chamber at a temperature of about 30°C with artificial cerebrospinal fluid (ACSF) saturated with carbogen. Spike activity of separate neurons were recorded for 1–2 hr. Dried and crushed mushroom fruiting bodies were filled with ethanol in the ratio 1:10 and infused for 10 days. The extract obtained was filtered and after ethanol evaporation distilled water was added to the initial volume. The extract obtained was diluted with ACSF up to the necessary concentration: 4–16% (pH 7.4). The effect of the extract obtained by ethanol infusion was studied on 51 neurons: 30 (59%) of them showed inhibition, 5 (10%) showed an excited reaction, and 16 (31%) neurons did not respond. We assume that the *H. erinaceus* extract contains substances blocking synaptic transmission. The extract had

no effect on GABA_A receptors and on 5-HT₂/5-HT_{1C} serotonin receptors. But it is not possible to exclude the possibility of its modulating action on serotonin receptors. The strength and mode of the neurotropic action of the *H. erinaceus* extract depend on the way their components are extracted. They are well dissolved in water and in acid medium (pH 5.5) and retain their properties even 1 month after preparation (at $T = 4^{\circ}\text{C}$). The extract components did not suppress biochemical processes in cells respiratory circuits, because some of the neurons inhibited during hypoxia did not react on application of the extract. The action of extract obtained from mushroom broth was more effective than that of ethanol or ether extracts. To study extract action on growth and development of nerve cells a technique of neuron cultivation on artificial medium was used. As a model, 12-day cerebellum and hippocampus cell cultures were used. *H. erinaceus* extract was added to the nutrient medium (10%) from the first day *in vitro*. Comparative morphological analysis of control and influenced cultures has not revealed any considerable difference.

Thus, it is established that the *H. erinaceus* extracts exert neurotropic action at concentrations that did not affect the growth of nerve cells *in vitro*, but they also did not evoke a toxic effect or nerve cell damage. Thus, they do not exert a direct action on neuronal GABA_A receptors and serotonin receptors, which play the important role of forming inhibitory processes in the central nervous system.