

The role of early postnatal feeding of rats with flavonoids from Saperavi on characteristics of epileptiform activity induced by electrical stimulation of CA1 field of hippocampus

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In recent years the new treatment strategies for neurodegenerative disorders focuses on flavonoids - plant antioxidants, which are characterized by anti-allergic, neuroprotective activity. flavonoids traverse the blood-brain barrier and are able to localize in the brain, with significantly higher levels in hippocampus and cortex, suggesting that they are candidates for direct neuroprotective and neuromodulative actions [2,3]. The hippocampus plays an important role in a learning/memory processes and it is also a common focus site in epilepsy [1].

Our previous experiments showed that early postnatal supplementation with flavonoids from Saperavi grapes have beneficial effects on the hippocampal-related learning mechanisms. Flavonoids from saperavi increases the number of BrdU-positive cells in the dentatus gyrus of the hippocampus, effectively protect the rat brain from kainic acid – induced neuronal injury and memory distruption associated with it.

The aim of the present work was to investigate the effects of early life exposure to flavonoids from saperavy (P7-P15, 25mg/kg per day) on the electrophysiological characteristics of the hippocampal neurons; on the threshold of epileptiform discharges and the properties of high-frequency activity (duration, amplitude envelope, and frequency spectrum).

According to our preliminary data early postnatal feeding with flavonoids from Saperavi increases the threshold of electrically induced epileptiform discharges, inhibits spontaneous hippocampal seizures in a control animals, as well as in a kainic acid rat model of epilepsy.

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References

1. J.J. Knierim, Curr Biol.(2015)7;25(23):R1116-21.
2. T.Murphy, G.P.Dias, S.Thuret. Neural Plast.(2014)32 page.
3. D. Vauzour, J. Sci. Food Agric. (2014)94(6):1042-56.