THE EFFECT OF POLYPHENOL EXTRACT ISOLATED FROM *KARELINIA CASPIA* PLANT ON MITOK_{ATP} CHANNEL OF LIVER MITOCHONDRIA

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Introduction: The modern approach to the study of the mechanism of action of new types of bioactive substances on the body and the evaluation of medicinal properties is based on screening studies conducted directly on the basis of *in vitro* experiments. In this regard, cellular mitochondria serve as a potential "target" and are considered a convenient object.

It is known that the functional activity of mitochondria mainly determines the vital activity of cells and the whole organism. Experimental studies have shown the importance of mitochondrial dysfunction in the development of various pathological conditions [1, 2]. One of the most studied mitochondrial factors that regulate the metabolic and functional activity of the cell is the mitochondrial ATP-dependent potassium channel (mitoK_{ATP})[3]. Taking into account that mitochondria is an organoid that mainly supplies the cell with energy, there are studies that show that one of the main factors determining mitochondrial dysfunction is the amount of ATP in the cell [4]. Approximately 80–90% of ATP in the cell is produced in the mitochondria during oxidative phosphorylation. The intensity of the process directly depends on the amount of oxygen, and a significant decrease in oxygen will gradually reduce the concentration of ATP [5]. These events lead to a decrease in the amount of energy in the cell and the formation of free radicals, reactive oxygen species [6, 7] (ROS), which derails energy metabolism in mitochondria and causes various pathological conditions such as ischemia and hypoxia.

Currently, treatment of various diseases with natural biologically active substances remains one of the most effective methods in the world. Biological natural compounds are usually isolated from medicinal plants. In the flora of Uzbekistan, it is possible to count some plants as an example which are famous for their medicinal properties (namatak, incense, mint, zupturum, saffron). Among them, BASs isolated from the natural growing (*Karelinia caspia*) plant in Uzbekistan are attracting the interest of many scientists due to their effective influence on various diseases. Scientists of the Institute of Bioorganic Chemistry of the Academy of Sciences of the Republic of Uzbekistan (Rahimov R.N., Mahmudov R.R. and Lutpillayev G.H.) have proven in experiments that the bioactive substances isolated from the white-headed plant (*Karelinia caspia*) are effective in neurodegenerative diseases. For this reason, the study of polyphenol extracts isolated from *Karelinia caspia* plant at the level of cells and cell organoids is an important factor in the identification of new types of bioactive substances.

Methods and materials: We used white male rats (180–220 g) during the experiments. Liver mitochondria were separated by differential centrifugation and protein content was determined by Lowry's method. Mitochondria were examined in an open cell in a spectrophotometer at a wavelength of 540 nm.

Results and discussion: The mitochondrial channel belongs to the family of ATP-dependent potassium channels, and all channels of this type are inhibited under the influence of a certain physiological concentration of ATP. Subsequently, the mitoK$_{ATP}$-channel is considered as a potential "target" for pathogens and BASs. Dysfunction of the mitoK$_{ATP}$ channel in various pathologies can be corrected with pharmacological agents. During our experiments, the effect of 5, 10, 15, 20 μg/ml of PF-1 extracts isolated from the *Karelinia caspia* plant on the activity of mito K$_{ATP}$ channel of rat liver mitochondria was studied.

Addition of 200 μM of ATP to the incubation inhibited the permeability of the mitoK$_{ATP}$-channel for K^+ ions by 76,8±2,07% compared to the control (no ATF added). Addition of PF-1 extract in the amount of 5 μg/ml to the cuvette had an activating effect on the mitoK$_{ATP}$-channel, that is, it increased the permeability of the mitoK$_{ATP}$-channel by 13.1±2.9% compared to the indicator inhibited by ATP. During the experiment, increasing the concentration of PF-1 extract, i.e. 10, 15, 20 μg/ml, increased the permeability of the mitoK$_{ATP}$-channel by 29,4±3,8%, 47,7±3,1%, 60±2,08% respectively, compared to the index inhibited by ATP. So, from the above data, we can see the activating effect of PF-1 extract on mitoK$_{ATP}$ channel.

In conclusion, the fact that PF-1 extract isolated from *Karelinia caspia* plant has mitoK$_{ATP}$-channel activating properties and this can be the basis for the production of hypoprotective and cardioprotective agents from PF-1 extract in the future.

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