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Development of composition based on echinochrome a with ascorbic acid and α-tocopherol for oral administration

Elena A. Vasileva, Natalia P. Mishchenko, Sergey A. Fedoreyev and **G. B. Elyakov**
Pacific Institute of Bioorganic Chemistry, Russian Federation

Secondary metabolites specific to sea urchins are known as spinochromes. The most well-known sea urchin pigment echinochrome A exhibit a wide range of pharmacological activities, for example antioxidant, anti-diabetic [1], anti-allergic [2], cardioprotective [3], and also protects mitochondrial functions against cardiotoxic drugs [4]. In addition, echinochrome A is the active substance in the cardioprotective and ophthalmic drug Histochrome®, produced in Russia from the sand dollar *Scaphechinus mirabilis* [5]. One of the main obstacles to the wide use of echinochrome A is its insolubility in water. Histochrome is available only in ampoules in the form of echinochrome A sodium salts for intravenous injections. To expand area of echinochrome A application, it is very important to investigate abilities of echinochrome A to form complexes with substances that can increase its solubility, protect its hydroxyl groups from oxidation, preserving or enhancing its pharmacological properties. Very recently, we obtained a powder composition of echinochrome A (Ech) with other well-known antioxidants – ascorbic acid (Asc) and alpha-tocopherol (Toc). Ratio of components was chosen based on the results of lipids peroxidation inhibition assay. The most strong antioxidant effect demonstrated composition Ech-Asc-Toc 5:5:1 [6]. We established that this composition containing bulk media is stable for 1 year and that addition of antioxidants and excipients does not affect echinochrome A permeability through artificial membrane imitating gastrointestinal tract (PAMPA assay). The developed composition showed *in vitro* antiviral activity against RNA-containing tick-borne encephalitis virus and DNA-containing herpes simplex virus type 1 [6]. The studied composition of antioxidants exhibits more potent antioxidant and antiviral properties than Ech itself, thus opening perspectives of its medical application as tablets and capsules. *This study was supported by the grant of the Ministry of Higher Education and Science of Russian Federation (project RFMEFI61317X0076).*

Recent Publications

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Biography

Elena A. Vasileva is Junior Researcher in the Laboratory of the Chemistry of Natural Quinonoid Compounds, G. B. Elyakov Pacific Institute of Bioorganic Chemistry, Vladivostok, Russia. She has an experience in identification, isolation and structure elucidation of natural quinonoid compounds from plants, their cell cultures and sea urchins.