ABSTRACT

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Title of PharmDr. Thesis:

Isolation and biological activity of the pigment myxoxanthophyll from microalgae

Global demand for natural pigments has increased in the past few years. Myxoxanthophyll, a glycosylated monocyclic carotenoid, is a pigment that occurs naturally in cyanobacteria but any scalable isolation process has not yet been developed to obtain it from its natural source. In this study, myxoxanthophyll was isolated from unicellular cyanobacterium *Synechocystis salina* (*S. salina*) using high performance countercurrent chromatography (HPCCC), where the lower phase of the biphasic solvent system composed of *n*-heptane–ethanol–water (2:4:4, v/v/v) was used as a mobile phase, whereas its upper phase was the stationary phase. For the HPCCC isolation, a multi-injection method was developed, and four consecutive sample injections (70 mg per each) were performed using 20 mg of myxoxanthophyll, which was finally purified with high performance liquid chromatography (HPLC). Overall, a final myxoxanthophyll yield of 15 mg (98% purity) was obtained. The target pigment showed weak antioxidant and tyrosinase inhibitory effect, and exhibited immune-stimulating properties by activating human granulocytes. The results presented here form a basis for the large-scale production of myxoxanthophyll, and shows the potential benefits of this pigment for human health.