P15. Coordination Compounds of Copper (II) as Regulators of Productivity and Biosynthesis of Cyanobacterium *Spirulina Platensis*

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Investigation of non-traditional sources of bioactive substances is one of the current directions of biotechnology development. Cyanobacterium *Spirulina platensis* is widely explored and used in recent decades as a source of important bioactive substances. An important direction in biotechnology research is obtaining of spirulina biomass fortified with important micronutrients. In last decades action of coordination compounds of Zn(II), Co(II), Fe(III), Mn(II), Se(IV), Cr(III) on the growth and biochemical composition of cyanobacteria and microalgae has been extensively studied. New procedures for obtaining biomass with high content of bioactive substances were used as a basis for developing new technologies for obtaining biomedical and nutraceutical remedies.

Recent researches have demonstrated pronounced biological activity of coordination compounds of copper (II) that have antimicrobial, antifungal, anti-inflammatory, and anticancer activity. In order to reduce copper toxicity cyanobacterium *Spirulina platensis* can be cultivated in presence of coordination compounds of Cu(II) that lead to obtaining biomass with high content of copper and other bioactive substances with antimicrobial effect.

The purpose of the research was the study of copper bioaccumulation in spirulina biomass and its distribution in various fractions extracted from biomass.

Research subject served cyanobacterium *Spirulina platensis CNM-CB-02*. As regulators of copper content in biomass were used coordination compounds of Cu (II) acetato-N-[2-(2-hidroxietilamino)-ethyl]-salicilidenimino(1-)copper ([Cu(L-H)(CH_3COO)]) and bromo-{3-[(2-hydroxy-5-nitro-benzylidene)-amino]-propane-1,2-diolo}(1-)copper ([Cu(L-H)Br]).

As a result of the research two procedures of cultivation of spirulina in the presence of new coordination compounds of Cu(II) were developed. These procedures of cultivation lead to obtaining biomass with high content of copper bound with organic compounds of biomass (proteins, oligopeptides, amino acids, lipids, carbohydrates). Cultivation of spirulina in the presence of the compounds [Cu(L-H)(CH_3COO)] and [Cu(L-H)Br] at a concentration of 2,0 and 6,0 mg/L leads to reduction of productivity (1,02 and 0.92 g/L), but at the same time copper content accumulated in biomass reaches values of 10,63 and 11,14 mg%, respectively. Using fractionation of spirulina biomass it was determined that the largest growth of copper content is in carbohydrate fraction (28% and 31%). About 30% and 27% of the total amount of copper accumulated is bound to amino acids and oligopeptides. Processes of obtaining biomass of *Spirulina platensis* enriched with copper bound to organic compounds could be applied to develop new technologies for obtaining copper components preparations with antimicrobial, anti-inflammatory, and anticancer activities.

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