

BIOTECHNOLOGICAL POTENTIAL OF SECONDARY METABOLITES PRODUCED BY CYANOBACTERIA FROM CURONIAN LAGOON

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The Curonian Lagoon is the largest and one of the most severely impacted by harmful cyanobacteria blooms in Europe. In summer, cyanobacterial biomass reaches over 100 mg/l [1,2] and is dominated by *Aphanizomenon flosaquae*, *Planktothrix agardhii*, *Microcystis* and *Dolichospermum* spp. [3]. The goal of this study was to examine the activity of metabolites produced by cyanobacteria from the Curonian Lagoon. Bloom samples collected in 2018 over the season differed in species composition and cyanobacterial biomass. The extracts prepared in 75% methanol were preliminary fractionated, and the obtained material was tested using enzymatic, antibacterial and cytotoxicity assays. The content of the samples was determined using LC-MS/MS. All tested samples inhibited the activity of trypsin and thrombin (mean relative inhibition of 81,5%), however, the strongest activity was observed in samples dominated by *Aph. flosaquae*. In antibacterial assays, samples dominated by *Dolichospermum* and *Microcystis* showed strong (>70%) inhibition of *Staphylococcus aureus*, *Enterococcus faecium* and *Pseudomonas aeruginosa* antibiotic resistant strains. Cytotoxic effects against human breast adenocarcinoma cell line were also observed. LC-MS/MS analysis of active fractions revealed presence of several classes of cyanopeptides, including aeruginosamids, microginins, anabaenopeptins and cyanopeptolins. Preliminary studies indicated that apart from the known toxins, cyanobacteria from Curonian Lagoon produce many bioactive metabolites of potential pharmacological application.

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