

## Replacement of Phototrophic Microorganisms Collection by New Prospective Cyanobacteria Strain

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**Aim of the study:** Questions of objective evaluation of current state of world biodiversity and renewal of disturbed ecosystem are actual for modern Kazakhstan. The aim of investigation is replenishment of collection cultures of cyanobacteria prospective for obtaining the biofuel, biofertilizers, biologically active substances.

**Material and Methods:** Cyanobacteria were collected according to general methods of algology. Determination of initial taxonomy of cyanobacteria was carried out based on morphological traits according to Elenkin and Gollerbach. For obtaining the strains used accumulative cultures with further isolation of monocultures. Cultivation of algae was carried out on liquid and agarized media Zarrouk, Gromov (7,5 - 9). Strains in collection are stored in glass tubes on 20 ml with cotton-cork bung, in petri dishes. For initiation of colonies growth they are crossed to enriched media and placed in a light installation under phyto-lamps (FAR 40 micromol м2с1, Pandora-Led, Russia) at room temperature during 12-14 days, after that strains put into refrigerator and cultivated at temperature +10 °C with additional illuminated by a daylight lamp-LB-40 (FAR 15 micromol м-2с-1). Reseeding of collection cultures performed every 2-3 months. Microscopy of cyanobacteria was carried out with the help of microscopes MS 20 (Micros, Austria) и Axio Imager A1 ("Carl Zeiss", Germany) with an increase in × 400, 1000 times.

**Results:** The search of prospective cyanobacteria strains from springs of Turgen gorge (Kazakhstan), Karlovy Vary (Czech Republic) and from Shar-Nuur lake (Bayan Ulgy region, Mongolia), from soils of Baghlan region (Northeast Afghanistan), from Lake Balkhash and Bilikol (Kazakhstan). From collected water and soil samples ten axenic cultures of cyanobacteria were obtained. From isolated cyanobacteria strains two toxin-forming cyanobacteria isolated from Shar-Nuur lake were collected, two cultures of nitrogen fixing cyanobacteria from soil of Baghlan region and one culture from Balkhash lake as prospective lipid and fatty acid producers. It was established that toxin-forming cyanobacteria *Desertifilum* sp. and *Nostoc* sp provided the greatest inhibitory effect on cancer cells proliferation of cell line M HeLa. Mass spectrometric analysis allowed attributing the toxins of cyanobacteria to the class of cyclic depsipeptides. In extracts of *Desertifilum* sp. two cyclic depsipeptides were found: micropeptin T and oscilla-peptine. In *Nostoc* sp. extract cryptophan was detected and - in small amount - cyclic depsipeptide micropeptin SD. Nitrogen fixing activity of cyanobacteria isolated from soils of Baghlan region in *Anabaena variabilis* made up 30.2 %, *Nostoc caldicola* -29.9%. The highest lipid content observed in *Cyanobacterium* sp. IPPAS B-1200. fatty acid composition analysis of *Cyanobacterium* sp. IPPAS B-1200 detected the high amount of myristic and myristoleic acids.

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