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Cyanobacterial strains, isolated from extreme conditions sources of Kazakhstan - producers of biodiesel

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ABSTRACT

In recent years a systematic and orderly mastering new cultures of cyanobacteria for further practical use in biotechnology. In this regard, the aim of this work was the isolation, identification and determination of fatty acid composition of new strains of cyanobacteria from extreme conditions sources of Kazakhstan.

Samples were isolated from lake Issyk (13°C), hot spring Turgen (45°C) and salinity lake Balkhash (salinity 4g/l). The standard techniques of cultivation of phototrophic microorganisms were used. Fatty acids were derived using methyl esters and separated by GC-MS Aligent 7890GC.

The results showed that 3 different strains were obtained: sp2 from Issyk, sp1 from Turgen and sp1 from Balkhash. Morphological characteristics and 16S rDNA gene were identified those strains as Synechococcus elongatus, Cyanobacterium aponinum and Cyanobacterium stanieri.

Strain Synechococcus elongatus sp.12 synthesized saturated 26.9% (generally palmitic) and unsaturated 73.1% (oleic, elenoic and elonoleic) FA. In Cyanobacterium aponinum sp.T1 strain advantageously synthesized saturated 62.8% (myristic and palmitic) and monoenic 37.1% (palmitoleic) FA. Cells of strain Cyanobacterium stanieri sp.B1 characterized by accumulation mainly of saturated and monounsaturated FA thus dominated myristic (30.1%) and palmitoleic (39.7%) acids. All isolates based on the composition of the FA can be used as producers for the production of biodiesel.