

Brief information about the project

Name of the project	AP13068051 «Development of technology for obtaining biological products based on strains of microalgae and cyanobacteria to increase the productivity of agricultural plants»
Relevance	Recently, the agricultural sector has been facing new challenges to increasing productivity in order to feed the world's growing population, while reducing its environmental impact and conserving natural resources for future generations. Biological products based on microalgae and cyanobacteria can contribute to solving these problems. These microorganisms have great potential for increasing soil fertility and stimulating plant growth. It should be noted about the high positive ecological role of cyanobacteria in the soil as nitrogen fixers, accumulators of organic matter. The creation of new biological preparations for increasing soil fertility opens up new perspectives in the use of microbial preparations in agronomy and, with great likelihood, can be used to solve general problems of biotechnology, where there is a need for microorganisms working in a stable community in a stable working community.
Purpose	To study the basics of using strains of microalgae and cyanobacteria in monocultures and consortia for use in increasing the productivity of agricultural crops and to develop on their basis a technology for obtaining biological products.
Objectives	<ol style="list-style-type: none">1. To isolate and obtain accessory cultures of microalgae and cyanobacteria from various soil ecosystems, to study their cultural and morphological properties and to carry out identification of the isolated pure cultures.2. To study the growth-stimulating activity of microalgae and cyanobacteria on agricultural plants in laboratory conditions.3. To study the influence of the selected strains of microalgae and cyanobacteria on phytopathogenic microorganisms and soil fungi.4. To carry out the selection of isolated and collection strains of microalgae and cyanobacteria according to the productivity of their biomass.5. Determine biologically active substances in the cells of selected strains of microalgae and cyanobacteria for use in agriculture as biological products.6. Optimization of cultivation conditions for strains of microalgae and cyanobacteria, to increase the productivity of accumulation of bioactive substances, potential for obtaining biological products.

	<p>7. Development of technological forms of biological products for agriculture based on selected strains of microalgae and cyanobacteria.</p> <p>8. To study the effect of a biological preparation based on microalgae and cyanobacteria on the microbiological and biological activity of the soil and on the physicochemical properties of the soil. Under the conditions of model experiments.</p> <p>9. Determine the effect of a biological product based on microalgae and cyanobacteria on the biological productivity of agricultural crops.</p> <p>10. To develop a technology for obtaining a biological product based on microalgae and cyanobacteria to increase soil fertility and yield of agricultural crops in field conditions.</p>
Expected and achieved results	<p>This project involves conducting applied research work to develop the scientific and methodological foundations of the technology for producing biological products based on microalgae and cyanobacteria to increase the yield of agricultural crops and soil fertility.</p> <p>To implement the project, soil samples were selected from the crop fields of the Republic of Kazakhstan, the species composition of the algal flora of the studied samples was determined, and pure cultures of microalgae and cyanobacteria were isolated that were promising for agricultural use. Their cultural and morphological properties were studied and the identification of isolated pure cultures was carried out. The influence of selected strains of microalgae and cyanobacteria in monocultures and consortia on the growth of agricultural plants and their effect on pathogens of infectious diseases of agricultural plants was also studied.</p> <p>A biochemical analysis of biologically active substances in the cells of selected strains of microalgae and cyanobacteria was carried out for use as a soil biofertilizer and a plant biostimulant and a search for optimal conditions for mass cultivation of selected cultures of microalgae and cyanobacteria - potential producers of biologically active substances for biological products, including such parameters as temperature, light intensity, composition of nutrient media, pH value of the medium, etc.</p> <p>As a result, based on the results obtained, a step-by-step technology will be developed for the production and use of a biological product based on microalgae and cyanobacteria to increase soil fertility and the yield of agricultural crops in field conditions.</p>
Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if	1. Sarsekeyeva Fariza, PhD - H index-3, ResearcherID: E-4491-2015

available) and links to relevant profiles	<p>ORCID https://orcid.org/0000-0001-9119-2279 Scopus author ID: 56524602300 2. Bolatkhan Kenjegal PhD - H index-8 ResearcherID: AAZ-8890-2020 https://orcid.org/0000-000-7133-6546 Scopus author ID: 55977615700 3. Token Aziza - https://orcid.org/0000-0003-0640-0614?lang=ru 4. Sandibayeva Sandugash - https://orcid.org/0000-0002-4340-8749 1.</p>
List of publications with links to them	
Patents	-

Выделение культур микроводорослей и цианобактерий из посевных полей РК



Получение аксеничных культур



Изучение морфолого-



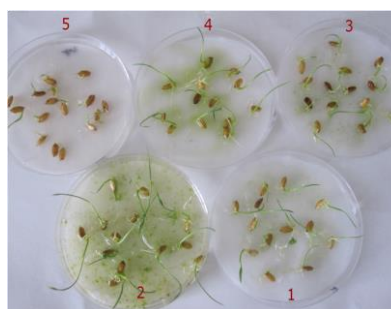
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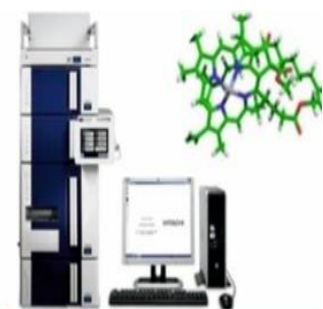
Изучение влияния на фитопатогенные микроорганизмы и грибы



Изучение роста стимулирующих свойств



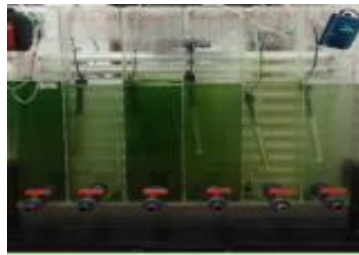
Определение биоактивных



Скрининг активных штаммов и оптимизация условий культивирования



Массовое культивирование и разработка



Изучение влияния биопрепарата на почву и



Разработка научно-обоснованной технологии получения биопрепарата на основе микроводорослей и цианобактерий для сельского хозяйства



