

Brief information about the project

Name of the project	IRN AR14869740 "Biotesting of water and sediments of the Ile river and Kapshagai reservoir, forecasting of environmental risk for biodiversity of the studied ecosystems"
Relevance	The main idea of the project is to assess the toxicogenetic potential of the water and sediments of the Ile River and the artificial Kapshagai reservoir created on it, which are actively involved in economic activities, and predict environmental risk based on comprehensive biotesting. Contamination of water bodies with toxicants, including those with mutagenic activity, may be the reason for the reduction of aquatic and terrestrial biological resources. The toxicity and genotoxicity of surface waters will be established by studying the cyto- and embryotoxic effects of water and sediments on aquatic and terrestrial animals of natural populations and in experiments on microbiological, plant and animal test objects. Based on the results obtained, an assessment of the environmental risk for the ecosystem of the Ile River and the Kapshagai reservoir will be given.
Purpose	The aim of the project is to study the ecological state of the ecosystem of the Ile River and the Kapshagai reservoir by monitoring the toxic and mutagenic activity of water and sediments at various test systems and test facilities.
Objectives	<p>1) to conduct a physico-chemical analysis of water, sediments from various sections of the Ile River and the Kapshagai reservoir to determine the content of inorganic and organic pollutants.</p> <p>As a result of the physico-chemical analysis of water and sediment samples from various sections of the Ile River and Kapshagai reservoir, priority pollutants will be identified;</p> <p>2) to study the toxic and genotoxic activity of water and sediments of the Ile River and Kapshagai reservoir on laboratory test facilities and test systems using modern research methods.</p> <p>As a result of this task, the toxic, cyto- and embryotoxic, teratogenic, genotoxic and mutagenic effects of water and sediments of the Ile River and Kapshagai reservoir on various test facilities and test systems will be established;</p> <p>3) to investigate the toxic and genotoxic effects of water and sediments from various sections of the Ile River and the Kapshagai reservoir on objects of natural populations: aquatic organisms (fish and amphibians), terrestrial representatives of animals (reptiles and rodents).</p> <p>As a result, the nature and level of cyto- and embryotoxic, teratogenic, and genotoxic disorders will be established in objects of natural populations from various biotopes of the Ile River and Kapshagai reservoir;</p>

	<p>4) carry out mapping of various sections of the Ile River and the Kapshagai reservoir according to the degree of contamination of water and sediments, the level of detected violations in laboratory test facilities and objects of natural populations.</p> <p>Based on the results of the physico-chemical analysis of water and sediments of the Ile River and Kapshagai reservoir, toxicogenetic studies of laboratory and natural objects, an assessment of the ecological state of the studied reservoirs will be given and mapping of various sites according to the degree of pollution for economic activity will be carried out;</p> <p>5) to determine the level of environmental and toxicogenetic risk to biota in various sections of the Ile River and Kapshagai reservoir.</p> <p>Using mathematical and statistical methods, based on the results obtained, the ecological and toxicogenetic risk for biota in various sections of the Ile River and the Kapshagai reservoir will be established.</p>
<p>Expected and achieved results</p>	<ul style="list-style-type: none"> - a physico-chemical analysis of water and sediments from various sections of the Ile River and Kapshagai reservoir has been carried out and priority pollutants have been identified; - the toxic and genotoxic activity of water and sediments of the Ile River and Kapshagai reservoir was studied at laboratory test facilities and test systems using modern research methods; - the toxic and genotoxic effect of water and bottom sediments from various sections of the Ile River and Kapshagai reservoir on objects of natural populations: hydrobiont (fish), terrestrial animal representatives (rodents) has been studied; - mapping of various sections of the Ile River and the Kapshagai reservoir was carried out according to the degree of contamination of water and sediments, the level of detected violations in laboratory test facilities and objects of natural populations;
<p>Research team members with their identifiers (Scopus Author ID, Researcher ID, ORCID, if available) and links to relevant profiles</p>	<ol style="list-style-type: none"> 1. Shalakhmetova Tamara Minajevna, Doctor of Biological Sciences, Professor, Hirsch Index – 6, ResearcherID - N-9691-2014; ORCID - 0000-0001-6724-9810, Scopus Author ID - 6603622408 2. Columbayeva Saule Zhanabaevna, Doctor of Biological Sciences, Professor, Hirsch Index – 4, ResearcherID - N-8528-2014; ORCID - 0000-0003-0835-3655, Scopus Author ID – 22134772600 3 Lovinskaya Anna Vladimirovna, PhD, Senior lecturer, Hirsch Index – 3, ResearcherID - N-6536-2014; ORCID - 0000-0001-7012-2415, Scopus Author ID – 55701592700 4 Sutueva Leyla Rakhmetullayevna, lecturer, Hirsch Index – 1, ResearcherID - F-3269-2017; ORCID- 0000-0002-4838-5339, Scopus Author ID – 57207357033

	5 Tlenshieva Arshyn Muratkyzy, doctoral student, Hirsch Index – 2, ResearcherID - ACY-7121-2022; ORCID - 0000-0002-3268-7068, Scopus Author ID - 57223870770
List of publications with links to them	<p>- Тленшиева А.М., Шалахметова Т.М. рН және температураның <i>Stenopharyngodon idella</i> эмбриологиялық дамуына оптималдык әсерін анықтау /DOI10.31489/2023BMG2/139-144 (https://dist.buketov.edu.kz/2023-110-2)</p> <p>- Tlenshieva AM., Witeska M., Shalakhmetova TM. Genotoxic and histopathological effects of the Ili River (Kazakhstan) water pollution on the grass carp <i>Stenopharyngodon idella</i> // <i>Environmental Pollutants and Bioavailability</i> Volume, 2022, 34(1), P. 297–307. https://doi.org/10.1080/26395940.2022.2101544 (Scopus Q2, 57%)</p> <p>- Тастан Д.А., Дуйсен А., Сутуева Л.Р., Тленшиева А., Конысбаев Т., Шалахметова Т.М. Гистопатология органов белого амура (<i>Stenopharyngodon idella</i>) из реки Иле и Капшагайского водохранилища // Вестник КазНУ. Серия экологическая, 2022, №2 (71), С.57-69 https://doi.org/10.26577/EJE.2022.v71.i2.06</p> <p>- Кожахметова Д.Д., Шалахметова Т.М., Чекимбаева Д.Т., Тленшиева А.М. Исследование влияния нитратов и нитритов на эмбриогенез <i>danio rerio</i> // Вестник КазНУ. Серия биологическая, 2023, №3 (96), С. 142-150 https://doi.org/10.26577/eb.2023.v96.i3.012</p>
Patents	-





