имеющие пищевые, лекарственные, декоративные свойства, такие как жировые, дубильные,кормовые, ядовитые, инсектицидные растения.

Ключевые слова: растительные сообщество, мезофитная флора, ксерофитная флора, семейство маревые, сложноцветные, редко встречаемые реликтовые растения.

Abstract

Atyrau region represents special interest for geobotanicsby its flora. Basis of the flora is herbaceous plants. Main kind of regional flora are specimens and family chenopodiaceae vent, asteraceae flowers, they are represented in various forms. There are plants with high tech, food, medicinal and ornamental properties: rubber, oil, tannins, fodder, poisons and insecticides.

Key words: plant community, the species is mesophilous flora, the xerophytic flora, family chenopodiaceae vent, asteraceae, epibiotic plants.

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COMPARATIVE ANALYSIS FOR THE CONTENT OF HEAVY METALS IN THE WATER OF PERETASKA RIVERS AND URAL

Abstract

This article provides an overview of the surface water volume, gives practical recommendations for water saving, and presents the result of water analyzes sampling of Ural River and Peretaska channel.

Water is a valuable natural resource. Every day for each of us about 2.5-3 liters per day is required for drinking and cooking, but this 1 m^3 per year is special potable water.

Key words: water, Ural river, Peretaska channel, indicators, WPI, results of an unscheduled water.

Introduction

Antarctica, scientists think, contains approximately 75% of the world's freshwater and 90% of the world's ice, and almost 10% of the continental glaciers are located in Antarctica and Greenland.

The scale of pollution of rivers and lakes in Kazakhstan is becoming critical. The waterways of our country are disturbed by their "polluted" fate. In the latest issue of the departmental bulletin they noted: of the 69 rivers of Kazakhstan, only 9 were recognized as clean. The remaining 60 are contaminated [1].

The ecological status of rivers and lakes is regularly monitored by the RGP "Kazgidromet" of the Department of Environmental Monitoring (Ministry of Environmental Protection). Specialists of this center are on duty at stations and posts near water bodies, take water samples and investigate it in laboratories. Laboratory assistants assess the level of pollution of surface and sea waters by the value of the water pollution index (WPI).

The water resources of Kazakhstan in the river basins have been studied in sufficient detail. However, the territory of Kazakhstan is located mainly in the lower parts of the rivers. Therefore, the amount of water coming from adjacent territories is gradually decreasing. Reliable determination of their values for the future is almost impossible; it is also very difficult to predict the volume of river flow, which should flow into the territory of the republic from adjacent territories [2].

The indicators of the sanitary and chemical analysis of the composition of wastewater allow one to assess the possibility of using certain methods and technologies for water purification. For treatment plants, the most important tasks of the sanitary and chemical analysis are to monitor the cleaning processes and evaluate the efficiency of each facility [3].

In the future, the Republic of Kazakhstan is not able to meet the water needs of economic sectors and preserve the natural complexes in river basins in a satisfactory condition. Therefore, the following necessary measures should be taken:

- Develop a long-term interstate agreement on the rational use and protection of water resources in transboundary river basins. First you need to develop a methodological basis for the division of water;

- Or develop measures to reduce specific water consumption rates in sectors of the economy, especially in the irrigated agriculture sector, by 2 or more times. In irrigated agriculture, it is advisable to consider the possibility of transferring water-intensive to low water intensive cultures; the widespread introduction of feed crop rotations. This is a cardinal measure, because in parallel it is possible to stop further deterioration of the ecological and reclamation condition of irrigation systems. Otherwise, in the long term, there is a danger of putting irrigation systems out of agricultural circulation in general, since the process of salt accumulation and a tendency to increase it is observed in irrigation systems. This is facilitated by the increasing in the salinity of irrigation water coming from the territory of neighboring states. The redevelopment of agricultural production areas: their transfer to the production of vegetables and melons, the development of horticulture and viticulture in order to provide the population of the Republic of Kazakhstan with these types of products; the priority of grain production is given to dry-growing agriculture; limited development of industrial crop production. It is necessary to harmonize the development of irrigated agriculture with the irrigation capacity of the watercourse. And, first of all, it is necessary to create conditions for the preservation and restoration of natural complexes in river basins.

- It is advisable to develop pond facilities and non-water-intensive or water-free industries. Such a task should be set for the next 5-10 years (for 2015-2020). Transboundary Rivers will occur at a rapid pace (will depend on the pace of development of industries in neighboring countries).

Main report

In the course of recent events on the fish extinction on the Ural River from December 2018 to 2019, studies were conducted on samples from the Ural River and the Peretaska channel.

In pursuance of the Protocol order of the Energy Vice-Minister of the Republic of Kazakhstan S. Nurlybay of 04.01.2019 RGP "Kazgidromet" from 08 to 21 January 2019 conducted daily unscheduled sampling of water at 13 sites in the river Zhayik and Yaik, Peretaska channels.

From 21.01. 2019 theRGP "Kazgidromet" switched to a weekly unscheduled sampling of water at the above 13 sites.

Laboratory analysis is performed on 41 indicators of water quality, including major ions, biogenic, organic matter and heavy metals.

The results of an unscheduledwater sampling of the Zhayik River for April 1, 2019 are shown in Table 1 [4].

Table 1 - The results of an unscheduled water sampling of the Zhayik River for April 1, 2019 (13 sites) [4].

	Water quality indicators name	Unit of measurement	MPC Norm	Zhayik river point 1 km higher from Atyrau city	
				01.04.2019г.	
				Actual concentrations.	Multiplicity Exceeding MPC
	Visual observations			Unusual facts for watercourse not detected	
	Water temperature	^{0}C	no	2.0	
	Hydrogen indicator		o	8.2	
	Oxygen saturation	%	o	44	
	Electrical conductivity	мкСм/см		395	
	Dissolved oxygen	mg/dm3		6.1	
	Biological oxygen consumption 5				
	Suspended substances	mg/dm3	no	420	

	Chromaticity	degrees	o	39	
0	Transparence	cm	o	30	
1	Smell	score	o	0	
2	Carbon dioxide	mg/dm3	o	0	
3	Chemical oxygen consumption	mg/dm3	o	18	
	MAIN IONS				
4	Chlorides	mg/dm3	00	74	0.2
5	Sulfate	mg/dm3	00	77	0.8
6	Hydrocarbonate	mg/dm3	no	109	
7	Calcium	mg/dm3	80	34	0.2
8	Magnesium	mg/dm3	0	28	0.7
9	Rigidity	mg/dm3	no	4.0	
0	Sodium and potassium sums	mg/dm3		53	
1	Ions sum	mg/dm3	no	380	
	BIOGENIC AND INORGANIC SUBSTANCES				
2	Ammonium Nitrogen	mg/dm3	.39	0.08	0.2
3	Nitrite nitrogen	mg/dm3	.02	0.0009	0.05
4	Nitrogen nitrate	mg/dm3	.1	3.7	0.4
5	Nitrogen sum	mg/dm3		3.8	
6	Phosphates	mg/dm3	no	0.002	
7	Common phosphorus	mg/dm3	no	0.2	
8	Common iron	mg/dm3	.1	0.09	0.9
9	Silicon	mg/dm3	no	1.1	
	Boron	mg/dm		0.01	0.6

0		3	.017	0	
1	Synthetic surfactants	mg/dm3		0.03	
	METALS				
2	Cuprum	mg/dm3	.001	0	0
3	Zinc	mg/dm3	.01	0.004	0.4
4	Chrome (3+)	mg/dm3	.005	0.001	0.2
5	Chrome (6+)	mg/dm3	.02	0.002	0.1
6	Common chrome	mg/dm3		0.003	
7	Manganese	mg/dm3	.01	0.002	0.2
8	Nickel	mg/dm3	.01	0.002	0.2
9	Hydrogen sulphide (H2S)	mg/dm3		0	
	ORGANIC SUBSTANCES				
0	Oil products	mg/dm3	.05	0.03	0.5
1	Phenols	mg/dm3	.001	0.00006	0.6

	Bottom sediment quality indicators name	Unit of measurement	Zhayik river point 1 km higher from Atyrau city»
			01.04.2019г
			Actual concentrations.
	Cuprum	mg/kg	0.5
	Zinc	mg/kg	1.3
	Nickel	mg/kg	0.4
	Common chrome	mg/kg	0.04
	Manganese	mg/kg	0.11
	Cadmium	mg/kg	0.24
	Plumbum	mg/kg	0.25
	Oil products	mg/kg	0.03

	Water quality indicators name	Unit of measurement	MPC Norm	Peretaska channel, 4 km, lower from Atyrau, 0.5 km lower the branch duct Peretaska	
				01.04.2019г	
				Actual concentrations.	Multiplicity Exceeding MPC

	Visual observations			Unusual facts for watercourse not detected	
	Water temperature	^{0}C	no	1.2	
	Hydrogen indicator		no	8.0	
	Oxygen saturation	%	no	40	
	Electrical conductivity	мкСм/см		421	
	Dissolved oxygen	мг/дм3		5.7	
	Biological oxygen consumption 5				
	Suspended substances	mg/dm3	no	379	
	Chromaticity	degree	no	38	
0	Transparence	см	no	28	
1	Smell	score	no	0	
2	Carbon dioxide	mg/dm3	no	0	
3	Chemical oxygen consumption	mg/dm3	no	19	
	MAIN IONS				
4	Chlorides	mg/dm3	00	80	0.3
5	Sulfate	mg/dm3	00	84	0.8
6	Hydrocarbonate	mg/dm3	no	183	
7	Calcium	mg/dm3	80	39	0.2
8	Magnesium	mg/dm3	0	32	0.8
9	Rigidity	mg/dm3	no	4.6	
0	Sodium and potassium sums	mg/dm3		61	
1	Ions sum	mg/dm3	no	483	
	BIOGENIC AND INORGANIC SUBSTANCES				
2	Ammonium Nitrogen	mg/dm3	.39	0.08	0.2
3	Nitrite nitrogen	mg/dm3	.02	0.002	0.1
	Nitrogen nitrate	mg/dm3		3.9	0.4

4			.1		
5	Nitrogen sum	mg/dm3		4.0	
6	Phosphates	mg/dm3	no	0.002	
7	Common phosphorus	mg/dm3	no	0.3	
8	Common iron	mg/dm3	.1	0.076	0.8
9	Silicon	mg/dm3	нет	1.2	
0	Boron	mg/dm3	.017	0.010	0.6
1	Synthetic surfactants	mg/dm3		0.03	
	METALS				
2	Cuprum	mg/dm3	.001	0	0
3	Zinc	mg/dm3	.01	0.003	0.3
4	Chrome (3+)	mg/dm3	.005	0.002	0.4
5	Chrome (6+)	mg/dm3	.02	0.003	0.2
6	Common chrome	mg/dm3		0.005	
7	Manganese	mg/dm3	.01	0.002	0.2
8	Nickel	mg/dm3	.01	0.003	0.3
9	Hydrogen sulphide (H2S)	mg/dm3		0	
	ORGANIC SUBSTANCES				
0	Oil products	mg/dm3	.05	0.04	0.9
1	Phenols	mg/dm3	.001	0.0007	0.7
	Water quality indicators name	Unit of measurement	MPC Norm	Peretaskachannelpoint ”7,6 km,lowerfromAtyrau,2 kmhigherfrom AtyrauTEC”	
				01.04.2019г	
				Actual concentrations.	Multiplicity Exceeding MPC
	Visual observations			Unusual facts for watercourse not detected	
	Water temperature	^{0}C	o	1.2	

	Hydrogen indicator		o	8.2	
	Oxygen saturation	%	o	46	
	Electrical conductivity	мкСм/см		401	
	Dissolved oxygen	mg/dm3		6.5	
	Biological oxygen consumption 5				
	Suspended substances	mg/dm3	o	445	
	Chromaticity	degree	o	38	
0	Transparence	см	o	27	
1	Smell	score	o	0	
2	Carbon dioxide	mg/dm3	o	0	
3	Chemical oxygen consumption	mg/dm3	o	21	
	MAIN IONS				
4	Chlorides	mg/dm3	00	85	0.3
5	Sulfate	mg/dm3	00	81	0.8
6	Hydrocarbonate	mg/dm3	no	140	
7	Calcium	mg/dm3	80	38	0.2
8	Magnesium	mg/dm3	0	30	0.8
9	Rigidity	mg/dm3	no	4.4	
0	Sodium and potassium sums	mg/dm3		50	
1	Ions sum	mg/dm3	no	429	
	BIOGENIC AND INORGANIC SUBSTANCES				
2	Ammonium Nitrogen	mg/dm3	.39	0.10	0.2
3	Nitrite nitrogen	mg/dm3	.02	0.001	0.1
4	Nitrogen nitrate	mg/dm3	.1	4.0	0.4
5	Nitrogen sum	mg/dm3		4.1	

6	Phosphates	mg/dm3	no	0.002	
7	Common phosphorus	mg/dm3	no	0.2	
8	Common iron	mg/dm3	.1	0.08	0.8
9	Silicon	mg/dm3	no	1.2	
0	Boron	mg/dm3	.017	0.011	0.6
1	Synthetic surfactants	mg/dm3		0.04	
	METALS				
2	Cuprum	mg/dm3	.001	0.001	1.0
3	Zinc	mg/dm3	.01	0.002	0.2
4	Chrome (3+)	mg/dm3	.005	0	0
5	Chrome (6+)	mg/dm3	.02	0.004	0.2
6	Common chrome	mg/dm3		0.004	
7	Manganese	mg/dm3	.01	0.001	0.1
8	Nickel	mg/dm3	.01	0.001	0.1
9	Hydrogen sulphide (H2S)	mg/dm3		0	
	ORGANIC SUBSTANCES				
0	Oil products	mg/dm3	.05	0.03	0.6
1	Phenols	mg/dm3	.001	0.0007	0.7
	Water quality indicators name	Unit of measurement	MPC Norm	Peretaskachannelpoint ”8.5 km,lowerfromAtyrau,2 kmhigherfrom AtyrauTEC”	
				01.04.2019г	
				Actual concentrations.	Multiplicity Exceeding MPC
	Visual observations				
	Water temperature	^{0}C	no	12	
	Hydrogen indicator		no	8.2	
	Oxygen saturation	%	no	56	

	Electrical conductivity	мкСм/см		393	
	Dissolved oxygen	mg/dm3		6.0	
	Biological oxygen consumption 5				
	Suspended substances	mg/dm3	no	386	
	Chromaticity	degree	no	39	
0	Transparence	см	no	26	
1	Smell	score	o	0	
2	Carbon dioxide	mg/dm3	o	0	
3	Chemical oxygen consumption	mg/dm3	o	19	
	MAIN IONS				
4	Chlorides	mg/dm3	00	89	0.3
5	Sulfate	mg/dm3	00	78	0.8
6	Hydrocarbonate	mg/dm3	no	134	
7	Calcium	mg/dm3	80	40	0.2
8	Magnesium	mg/dm3	0	30	0.7
9	Rigidity	mg/dm3	no	4.4	
0	Sodium and potassium sums	mg/dm3		61	
1	Ions sum	mg/dm3	нет	436	
	BIOGENIC AND INORGANIC SUBSTANCES				
2	Ammonium Nitrogen	mg/dm3	.39	0.09	0.2
3	Nitrite nitrogen	mg/dm3	.02	0.0009	0.05
4	Nitrogen nitrate	mg/dm3	.1	4.3	0.5
5	Nitrogen sum	mg/dm3		4.4	
6	Phosphates	mg/dm3	no	0.003	
7	Common phosphorus	mg/dm3	no	0.3	
	Common iron	mg/dm3		0.09	0.9

8			.1		
9	Silicon	mg/dm3	no	1.3	
0	Boron	mg/dm3	.017	0.015	0.9
1	Synthetic surfactants	mg/dm3		0.03	
	METALS				
2	Cuprum	mg/dm3	.001	0	0
3	Zinc	mg/dm3	.01	0.003	0.3
4	Chrome (3+)	mg/dm3	.005	0	0
5	Chrome (6+)	mg/dm3	.02	0.003	0.2
6	Common chrome	mg/dm3		0.003	
7	Manganese	mg/dm3	.01	0.002	0.2
8	Nickel	mg/dm3	.01	0	0
9	Hydrogen sulphide (H2S)	mg/dm3		0	
	ORGANIC SUBSTANCES				
0	Oil products	mg/dm3	.05	0.04	0.8
1	Phenols	mg/dm3	.001	0.0009	0.9

	Bottom sediment quality indicators name	Unit of measurement	Peretaskachannelpoint ”8.5 km,lowerfromAtyrau,2 kmlowerfrom AtyrauTEC”
			01.04.2019г
			Actual concentrations.
	Cuprum	mg/kg	0.3
	Zinc	mg/kg	1.2
	Nickel	mg/kg	0.7
	Common chrome	mg/kg	0.01
	Manganese	mg/kg	0.08
	Cadmium	mg/kg	0.2
	Plumbum	mg/kg	0.1
	Oil products	mg/kg	0.03

	Water quality indicators name	Unit of measurement	MPC Norm	проток Яик точка 11км ниже г. Атырау, выше с.Ракуша,0,5км ниже ответвления протока Яик	
				01.04.2019г	
				Actual	Multiplicity

				concentrations.	Exceeding MPC
	Visual observations			Unusual facts for watercourse not detected	
	Water temperature	^{0}C	o	2.0	
	Hydrogen indicator		o	8.3	
	Oxygen saturation	%	o	51	
	Electrical conductivity	мкСм/см		301	
	Dissolved oxygen	mg/dm3		7.1	
	Biological oxygen consumption 5				
	Suspended substances	mg/dm3	no	315	
	Chromaticity	degree	no	38	
0	Transparence	см	no	27	
1	Smell	score	no	0	
2	Carbon dioxide	mg/dm3	no	0	
3	Chemical oxygen consumption	mg/dm3	no	20	
	MAIN IONS				
4	Chlorides	mg/dm3	300	90	0.3
5	Sulfate	mg/dm3	100	75	0.8
6	Hydrocarbonate	mg/dm3	no	79	
7	Calcium	mg/dm3	180	30	0.2
8	Magnesium	mg/dm3	40	31	0.8
9	Rigidity	mg/dm3	no	4.1	
0	Sodium and potassium sums	mg/dm3		49	
1	Ions sum	mg/dm3	no	358	
	BIOGENIC AND INORGANIC SUBSTANCES				
2	Ammonium Nitrogen	mg/dm3	0.39	0.08	0.2
3	Nitrite nitrogen	mg/dm3	0.02	0.003	0.2
4	Nitrogen nitrate	mg/dm3	9.1	4.1	0.5

5	Nitrogen sum	mg/dm3		4.2	
6	Phosphates	mg/dm3	no	0.002	
7	Common phosphorus	mg/dm3	no	0.2	
8	Common iron	mg/dm3	0.1	0.08	0.8
9	Silicon	mg/dm3	no	1.0	
0	Boron	mg/dm3	0.017	0.011	0.6
1	Synthetic surfactants	mg/dm3		0.05	
	METALS				
2	Cuprum	mg/dm3	0.001	0.001	1.0
3	Zinc	mg/dm3	0.01	0.003	0.3
4	Chrome (3+)	mg/dm3	0.005	0.001	0.2
5	Chrome (6+)	mg/dm3	0.02	0.002	0.1
6	Common chrome	mg/dm3		0.003	
7	Manganese	mg/dm3	0.01	0.0025	0.3
8	Nickel	mg/dm3	0.01	0.001	0.1
9	Hydrogen sulphide (H2S)	mg/dm3		0	
	ORGANIC SUBSTANCES				
0	Oil products	mg/dm3	0.05	0.03	0.6
1	Phenols	mg/dm3	0.001	0.0006	0.6

Conclusion

Some practical and theoretical questions of the toxicity of heavy metals are considered. A comparative analysis of the content of heavy metals in the Ural River and the Peretaska channel are given.

The main waterway of Atyrau city is the flat Ural river, which belongs to the highest category of fisheries water bodies. In addition, periodically drying up left-bank tributaries of the Urals - Peretaska, Bukharka rivers and right bank tributaries - the Baksai and Chernoyarka. The Ural River within the Atyrau region is characterized by its quality as "clean" (class 2, WPI = 0.6-0.7). Excess of MPC

is noted on phenol (to 2 MPC) and on nitrogen nitrate (to 3.8 MPC). The dirtiest water in Ural River is observed at the confluence of Ilek River. Excess of MPC is noted on boron (20.3 MPC), six valent chromium (15.2 MPC), phenols (4 MPC), and nitrates (2.3 MPC). Then the river self-cleans and at the site of Uralsk city its characteristics vary from "clean" to "polluted". In hydrogeological terms, the territory is confined to the south-eastern part of the West Caspian artesian basin of the second order. The main load of anthropogenic impact, as a rule, is borne by aquifers, which are the first to be located on the surface. On the ANPZ LLP territory, such are the continental aquifers - modern and Upper Quaternary alluvial and alluvial-delta, aquifer thickness is 3-9 m, sediments are represented by fine-grained sands and sandy loams, sandy clays. The depth of groundwater from 0.5 to 6.0m.; Caspian Sea, Urals river and the Peretaska channel pollutions from LLP "ANPZ" through groundwater is excluded due to a small hydraulic slope, a very small slope of the terrain of small amount of precipitation, poor aquifer water cut and a relatively low filtration rate. The main potential sources of groundwater pollution currently include the evaporation pond on the left-bank part of Atyrau. The wastewater evaporator pond has existed for more than 60 years and receives wastewater not only from ANPZ LLP, but also discharges of industrial and public utilities from the entire left-bank part of Atyrau therefore, is among the most significant potential sources of influence on groundwater at present time.

According to the results of monitoring observations in 2014-2019. for the state of the first aquifer from the surface, in the area of the observation wells, it was shown that the chemical content in groundwater does not exceed the background. The content of petroleum products, phenols, heavy metals in groundwater samples according to monitoring studies do not exceed the MPC. Groundwater quality has been stable over the past 5 years.

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Аңдатпа

Бұл мақалада жер үсті суларының шолу жасалынған, суды үнемдеу бойынша тәжірибелік ұсынымдар беріліп, Орал өзенінің және Перетаска каналының суларын сараптау нәтижелерін ұсынылады.

Негізгі сөздер: су, өзен, канал, талдау, сараптау, Жайық, Перетаска, су ластанудың индексі.

Аннотация

В данной статье сделан обзор объема поверхностных вод, даны практические рекомендации по водосбережению, приведены результаты анализов отбора проб воды реки Урал и протока Перетаска.

Ключевые слова: вода, река Урал, канал Перетаска, индекс загрязнения воды, рекомендации по очистке вод.

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КӨМІРТЕКТІ НАНОМАТЕРИАЛДАР ЖӘНЕ ОЛАРДЫҢ НЕГІЗІНДЕГІ КОМПОЗИТТЕР

Аңдатпа

Мақалада көміртекті наноматериалдар мен олардың композиттері туралы толық сипаттама және олардың жіктелуі, нанокөміртекті түзілімдердің физикалық қасиеттерін сипаттайтын әдеби деректер, олардың негізінде композиттерді басым пайдалану себептері жинақталған. Қышқыл және негізгі оксидті беттік түзілімдердің табиғаты, олардың технологиялық процестерде ұқсас композиттерді пайдалану мүмкіндігіне оң және теріс әсері, құрылысты басқару жолдары және беттік құрылымдардың шоғырлануы қарастырылды.

Негізгі сөздер: көміртекті нанотрубкалар, талшықтар, беттік оксидтер;, табиғат, әсері, қасиеттері, композиттерді қолдану.

Наноматериалдар нанотехнологияның ғылыми іргетасы болып есептелінеді. Болашақта бізді наноматериалдар ауқымында революция күтіп тұрғаны анық. Наноматериалдар негізіндегі материалдар, өнімдер мен құралдар, наноробот тектестер дүниелер алынып, олардың біздің өмірімізді алға жылжытары қақ. Мұнымен бәрі келіседі, бірақ-та осының боларын ешкім де кесіп айта алмайды. Наноматериалдар қазіргі таңда бүкіл әлем бойынша зертханалардағы көптеген өңдеулер мен зерттеулерде негізгі пән болып табылады. Олар едәуір ұсақ компонентті өнімдердің өнімділігін арттыруға талпынуда. Әлбетте, мұның бәрі максималды түрде төмен бағада