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Estimation of Degree of Safety of Water Resources of Southern Aral Sea Area

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Abstract: ***Ecological safety in Republic of Karakalpakstan determines the global state of unique natural complexes. To the article the results of research on differentiation of territory of Karakalpakstan are driven on the degree of contamination. Southern Aral Sea Area (Republic of Karakalpakstan) as a large region, with certain environmental conditions and unique biological resources, deserves the special attention. Importance of complex ecological analysis consists in that his results have the large applied value. In addition, an ecological situation in Republic of Karakalpakstan determines the global state of unique natural complexes. The conducted ranging on the degree of muddiness of water in the different districts of Karakalpakstan showed that high degree of contamination of water objects it is marked in Northlands of republic, and middle degree of muddiness - in the central districts of Karakalpakstan.***

Keywords: Karakalpakstan, ranging, degree of contamination, water objects, atmospheric air

1. Introduction

The guard of environment, maintenance of health of man,, decline of negative consequences of influence of negative natural factors, remains the fundamental task of medical, biological and ecological researches. The health of people depends on the degree of contamination of environment, including a sial, hydrosphere and atmosphere, flora and fauna.

Southern Aral Sea Area (Republic of Karakalpakstan) as a large region, with certain environmental conditions and unique biological resources, deserves the special attention. Importance of complex ecological analysis consists in that his results have the large applied value. In addition, an ecological situation in Republic of Karakalpakstan determines the global state of unique natural complexes.

The ecological method of analysis is widely used practically in entire countries the CIS and far abroad in practice of guard of defence of environment and health of population. So, for example, researchers often use current statistical data about the state of health of population, to set connection between the factors of environment and state of health of population.

2. Methodology

The standards of soil, water and air, taken in the Central, North and South zones of Republic of Karakalpakstan, were in-process used. Normative documents and methodologies of determination of quality and quantitative indexes are in-process used: for the estimation of the state of environment used sanitary norms and rules of Republic of Uzbekistan.

For determination of degrees of infection and ecological loading and risk factors in Republic of Karakalpakstan on the initial stage of researches territorial zones were certain in the cut of geographical location of Aral sea area (Биглхол et al.,1994). For finding out of reasons and hearths of contamination conducted an analysis on the use of pesticides and biological preparations widely used in an agrarian sector and industry of Karakalpakstan.

The analysis the soils taken from horizons of layer a 0-30 cm were exposed to, from the different districts of Republic of Karakalpakstan. The microbiological analysis of soil was conducted by the research workers of laboratory of Ecology of microorganisms of the Kara-kalpak research institute of natural sciences.

3. Results and Discussion

The study of safety and sanitary indexes of well and plumbing water was shown, that Mercury and arsenic was not contain in a tap water, concentration of toxic elements in a reservoir were high and some ten times exceeded the norms of maximum possible concentration (MPC), set by the State standards (table. 1). Concentrations of ions of metals and toxic metals (Co, Na, Pb, Cs, St, Se, Lu) were high almost in a 40 % exceeding MPC -Indexe, that is extraordinarily critical.

Table 1: Indexes of quality of water of channel "Kyzketken" (May 2017-2018)

Indexes	Actual	Rationed on sanitary norms and rules (SNR)
Original appearance: Color, taste, smell	White-bluish, taste ordinary, odourless	
Specific gravity, g/ml (1,,01)	1,14-1,21	no more 0,05
Sinking at boiling, g	0,17,-0,3	no more 0,1
Index of pH	7,6 – 7,8	no more 5,3-5,7
Microbiological indexes		
Coli morph of bacterium, WHICH/ml	5×10^{4}	no more $1,5\times10^{2}$
Maintenance of yeasts and mould mushrooms in 1,0 ml	45-50	no more 20
Coliformss in 1,0 ml	3×10^{2}	Shut out

S. aureus в 0,1 ml	$1,2\times10^{2}$	Shut out
Pathogenic microorganisms, including salmonellas, in 25,0 ml	$1,5\times10^{4}$	Shut out
Mercury, arsenic	not discovered	
Lead, mg/l	0,43	0,10
Cadmium, mg/l	0,21	0,05
Copper, mg/l	3,4	1,0
DDT and metabolite, mg/l	0,93	0,01

It was discovered that presence of *Staphylococcus aureus*, *Echerichia coli*, maintenance of yeasts and mould mushrooms, Coli morph bacteria were exceeded by sanitary norms, that can be the sources of disease of plural illnesses, especially infectious diseases. The presence of ions of heavy metals, their complexes, and also sums of GXCG, and DDT, exceeded MPC rationed on SNR in composition water of channel of "Kyzketken" and shows about disqualification of this water for the use, and also swimming.

Table 2: Ecological groups of muddiness of reservoirs of Karakalpakstan

Index of quality of water, group	Ranging of districts on the index of muddiness of water			of Zone Aral sae area
	Index of contamination	Districts of Karakalpakstan	Degree of contamination	Districts
I	0,01-0,3	not present	Very clean	-
II	0,3-1,0	not present	Clean	-
III	1,3	Chimbay, Nukus	Mildly muddy	North, Central
IV	2,8-3,5	Khodjeyli Kegeyli Nukus	Muddy	Central
V	4,7-5,8	Takhtakupir Karauzak Kanlykul Amudariya Turtkul	Dirty	More North, South
VI	6,7-9,4	Kungrad Muynak Shumanay Beruny	Very dirty	North, Central, South
VII	More 10	not present	Extraordinarily muddy	Shut out

In composition well and plumbing water was not found out a pathogenic microflora having a large danger. It was marked is a presence of different microorganisms in a norm in a tap water, a very little more norm is in well water, where cages of bacteria are. Being of mould mushrooms is marked in both standards of water, that testifies to atmospheric and by less soil contamination of water.

Research of sanitary-hygienic and chemical indexes of water objects and drinking-water in 14 - districts of Karakalpakstan was shown, that they had subzero sanitary, high chemical indexes, including maintenance of pesticides. There are water sources with moderate, muddy, dirty and by the very dirty indexes of muddiness. It should be noted that were not found out the water objects, related to very clean, clean and to the extraordinarily dirty category (Мамбетуллаева et al., 2005).
Undertaken studies on determination of quality and quantitative indexes of soil, water, air showed that in the North, Central, South districts of Karakalpakstan safe zones are absent.

There are districts with the relatively satisfactory states of environment, т.е Ellikkala, Beruny and Amudarya are almost all Southern districts of Republic of Karakalpakstan. Very dirty water resources have Kungrad, Muynak, Shumanay and Beruny districts. The critical condition of environment found out in Kungrad, Muynak, Kegeyli and Takhtakupir districts. i.e. almost all Northlands of PK. Thus, it is set, soil sources are more shivy in Northlands, after in Central, further in the Southern districts of Karakalpakstan.

Monitoring and analysis of sanitary-hygenic and chemical indexes of water objects and drinking-water of - districts of Karakalpakstan, showed that they had subzero sanitary, high chemical indexes, including maintenance of pesticides, exceeding norms of MPC. It is set that water sources are more obstruction in Northlands, after in Central, further in the South districts of Republic of Karakalpakstan (Разаков et al., 2004). The conducted analysis allowed to estimate the situation of ecological tension of the investigated territory for to 4 categories: 1 - relatively satisfactory; 2 - substantially tense; 3 - substantially-tense and 4 - tensely critical.

Ranging of territory of region of Aral sea area region with the estimation of changes of health of population of dependence of presence and influence of harmful factors of habitat educed deviations of levels from middle - "base-line", "regional" or "control", both separate indexes (characterizing the state of health of population or separate task forces) and general medical –demography descriptions.

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