

*Materials of Conferences***THE ECOLOGICALLY-ORIENTED RECREATIONAL ACTIVITIES – THE NEW DIRECTION IN CHILDREN AND TEENAGERS EDUCATION**

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The rationale for the introduction necessity of environmentally-oriented recreational activities in the education of children and adolescents has been given in this paper. The teaching technologies experience in the environmental education, and the results of the research and experimental study have been presented in this paper.

The tourism and region conducting, local history, geography and culture, in the aspect of the ecological education of children and adolescents have already been given the great significance [1, 8, 9]. So, this challenge has, repeatedly, been raised up at the scientific, theoretical, and practical conferences of the different levels, as well as in the various scientific papers, articles, and publications [2, 4, 5]. The concept of «the ecologically-oriented recreational activities» (EORA) has already been formed, as a result of the research and experimental study and, as the author's understanding, it is consonant with the notion of «the ecologo-tourism activity», having interpreted, as: «the purposeful process of the formation of the ecological knowledge, skills, value orientations, norms of behavior in the natural environment, having based on the active tourist, local history, and regional activities and studies students» [3, p. 8]. So, in the further studies – the concept borders of «the ecologo-tourism activity» have already been defined, as the constituent part of the more capacious concept of «the ecologically – oriented recreational activities». This has been justified by the fact, that the recreational activities are practically included the tourism activity, which is usually extended not only to the environmental, but also in the social environment, i.e. in the social and natural environment [4, p. 145].

Thus, the quite new direction has already been formed in the ecological education of the children through the lesson of the special course «The Ecology, Tourism, Recreation» (e.g. the pilot and experimental studies 1997–2002, MOY COIII-27, Tyumen; 2002–2013, MAOY COIII-70, Tyumen) [5]. Here, the children, having engaged in the active forms of the recreation in the social and natural environment, have been formed the ecologically – oriented behavioral skills (e.g. the environmental competence): the movements in the natural environment, remediation, treatment with the wild animals, collateral wildlife and natural management side. Thus, at the optimal pedagogical technologies choosing: the continuity and succession ensuring of

the system in general and additional education – it can be the ecologically – oriented recreational activities of the junior schoolchildren and adolescents [7, pp. 30–31]. For all this, the environment competences are being formed at the young recreants [6].

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ENVIRONMENTAL AND TECHNOLOGICAL CHALLENGES OF INDUSTRIAL CITIES

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State ecological monitoring of atmospheric air in populated areas of industrial regions of Russia, especially the territory of Eastern Siberia, reveals systematic exceedings of maximum permissible hygienic concentrations (MPC) of carcinogenic solution of the 1st class of hazard benzopyrene (BaP) in

cities with production of aluminium. At the example of the city of Shelekhov of Irkutsk region, where enterprise of electrolytic receiving of aluminum via technologies with self-burning anodes at the foun-

dition of stone coal coke-pitch compositions JSC «IrKAZ-SUAL» is located, significant (2–5 MPC) and high (over 5 MPC) degrees of pollution has been registered at almost all objects of biosphere (Table 1).

Table 1

BaP in urban ecosystem of the city of Shelekhov and its suburbs

Objects of environment (units of measurement)	Mass concentration of bezapyrene			
	Minimum-maximum (n is a number of samples)	background		MPC
		Russia	region	
Atmospheric air, ng·m ⁻³	0,1–61 (n = 78)	0,1	< 0,01	1
Snow cover, ng·g ⁻¹	9–13550 (n = 20)	6–15	1–3	–
Soil of various purpose, ng·g ⁻¹	5,3–1300 (n = 100)	1–3 (15–20, black earth)	0,3 (grey forest)	20
Vegetation, ng·g ⁻¹	10–530 (n = 20)	1–5	7–15	1 (grain)
Surface water, ng·dm ⁻³	1–40 (n = 20)	0,1	< 0,1	5
Bottom depositions, ng·g ⁻¹	50–270 (n = 15)	1–3	0,6	20

The received results of condition of environment object represent carcinogenic hazard for natural ecosystems and human health, and it is necessary to allocate pollution sources in order to decrease or remove their negative impact com-

pletely. Therefore, balance of BaP in major sources of atmospheric pollution including productions of aluminium, construction materials, and also heating and transport system has been evaluated. The results are provided in Table 2.

Table 2

Contents and balance of BaP in sources of biosphere pollution on the territory of the city of Shelekhov

Production type	Discharge into atmosphere		Dumps into water reservoirs	
	t·year ⁻¹	contribution, %	ng·dm ⁻³	contribution, %
Sources of discharge				
Receipt of aluminium Electrolytic department	1,559	89,20	1135	97,2
Heat energetics Dust-coal boiling facilities	0,0003	0,02	3,2	0,3
Heating system Household stove	0,18	10,3	–	–
Construction industry Facilities of baking and receiving asphalt-concrete	0,0035	0,20	30	2,5
Automobile transport Gasoline and diesel engines of internal combustion	0,0052	0,28	–	–
TOTAL:	1,748	100	–	100

For all anthropogenic objects about 90% of total amount of BaP comes from discharges of sources of electrolytic department of aluminium plant. The existing technology if the most unfavourable one in ecological meaning, and it requires reorganization. Particularly, replacement of stone coal stoves with oil-based ones, self-burning anodes with already burnt type, implementation of efficient methods of cleaning gas-dust discharges, facilitation of circulation water supply will provide for a decrease in discharges of carcinogenic substances into environment.

The second biggest part in discharges of BaP into atmosphere refers to heat sources of heating systems – household stoves of private sector with facilitation of solid types of coal and wood fuel. Contribution of sources of industrial production, automobile transport, and heat sources of greater power has formed tenth and hundredth parts of total

substance mass. In case of sewer waters the greatest concentrations of BaP have been registered around production of aluminium.

Thus, high and significant, almost omnipresent pollution of natural environment objects of the studied urban ecosystem with carcinogenic BaP that exceeds background and hygienic levels, defines a great degree of ecological risk for the population and natural ecosystems of Southern Baikal area. These results testify for the presence of powerful sources of BaP discharge, and it requires new technologies of production and an efficient system of cleaning their discharges and dumps.

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