

### Biological test of the water from river Byck

<i>Points of drawing of the test</i>	<i>Wednesd ay (%)</i>	<i>Friday (%)</i>	<i>Sund ay (%)</i>
<i>Control</i>	0	0	0
<i>At the entrance of the city</i>	6,66	3,33	3,33
<i>Mihai Viteazul street</i>	20,0	16,6	10,0
<i>Ismail street</i>	30,0	36,6	20,0
<i>Upper to the combing out station</i>	36,6	46,6	26,6

Comparing the tested water samples that were collected in different days of the week, we can find out that the water from the river is not acute toxic, because there didn't die more than 50 % of the organisms, but the received results from the last station (downstream the city) are very closed to this index. On the weekend (on Sunday) when less factories are in function, the death rate of organisms in the tested water is lower, but the maxim death rate was registered on Friday in the samples collected from the stream of the river downstream the city.

The results of this investigation permits to make the following conclusions:

1. It was proved that the river Byck doesn't manifest any acute toxicity on gamarids. But in the samples drawing from the stream of the river downstream the city, the death rate of the organisms during 96 hours approaches more to the critic amount (50 % death rate) that characterize the acute toxic water. Downstream the city was registered a death rate of 46,6 % gamarids introduced in the water samples.

2. Comparing the biological test results of the water of Byck with modification of the chemical composition of the water and of the biodiversity on this sector of the river is distinguished a direct correlation.

3. The biological test of the river with the help of gamarids is a kind of operative method, it reflects the objective reality and it's not expensive.

4. I suggests this method to be used widely in school programs in order to trace out the main sources of pollution of the lakes rivers and springs.

## SEWAGE WATER BIOMONITORING USING INVERTEBRATES AS BIOINDICATORS

*Daria Safronova,  
St. Petersburg, Russia*

In connection with constantly growing anthropogenous load on the water objects it is more sharply felt the necessity of development and creation the system, including continuous monitoring of the water environment. Dumping of sewage

water of a various origin in the water objects makes the big changes in their hydrochemical and biological status, change the water quality, break the normal ability for living of flora and fauna. Among the variety of existing methods biological ones, characterizing quality of the water as the habitat of hydrobionts, allow to give an integrated estimation of a complex influence of different components and factors of the water environment on its population, to estimate the biological effect of the reservoirs pollution. Advantage of these methods in comparison with physicochemical ones is the possibility to carry out the analysis based on the reactions of alive organisms, when it is possible to judge a degree of positive and negative influence of various factors of environment on the different levels. Perspective branch of such ways of the water quality control is the method based on the registration of the hydrobionts physiological parameters. The best way to see the dynamics of the water quality as a habitat of alive organisms is to arrange the continuous biomonitoring, tracing changes of physiological characteristics of objects-bioindicators.

So the purpose of the given study was estimation the quality of the water at the Northern Station of Aeration in Saint-Petersburg as the hydrobionts habitat with a help of the method of their cardiac activity registration, using the crayfish species *Procambarus clarkii* (Girard) as bioindicators, by realization the continuous monitoring of the sewage water. Scientific work was carried out on the basis of the Saint-Petersburg Scientific Research Center for Ecological Safety, Russian Academy of Sciences, in the laboratory of experimental ecology of water systems, and also at the Northern Station of Aeration of the State Unitary Enterprise "Vodokanal Saint-Petersburg".

For realization the biomonitoring of the water at Northern Station of Aeration was developed and created a special system with four experimental aquariums, providing as the individual maintenance, so the maintenance of crayfish family in the stream of industrial water. The non-invasive method was used for estimation the water quality, developed in the laboratory mentioned above. On its basis lays the registration of the crayfish heart activity with the help of the optical fibre gauge, which fastens on the animals carapace, allowing to carry out the analysis of the data taken from the laser photocardigrams in conditions of the free animals behaviour. Experimental installation includes laser cardiograph, consisting of the receiving-radiating block and the analogous converter, optical paths, the optical fibre gauge, a digital remembering oscillograph and the computer for secondary processing of the signals. The method allows to carry out the operative control of the heart activity and by its changes to judge about the physiological state of an organism-bioindicator as by the single measurements, also in a mode of the continuous control in the real time, to estimate a functional state not only of adults, but also of the animals during their early ontogenesis.

Various functional states of crayfish are determined by the features of the cardiac activity, in particular, by the change of time and amplitude characteristics of the cardiac cycles. Further the fragments of cardiograms are automatically processed on the computer using the method of variation pulsometry, which is the mode of the

statistical analysis with the elements of probabilistic approach. Variation pulsometry allows to reveal the law of distribution of the casual process, like the heart rhythm is, and to characterize it quantitatively.

The control of the crayfish functional state was carried out by the analysis of their cardiac activity as follows: heart rate of the animals was registered in the rest and stress functional states. Right at the transition from a rest functional state to a stress one in reply to an influence of the factor, which change the state of the bioindicator, animals show change of the heart rate, proportional to loading, including the pollution of the environment. As the deterioration of environment increases, crayfish show the increase of the intensity of the cardiovascular system condition, so the heart rate will also increase. The similar situation is observed during the process of transition animals from a state of health to illness as a result of the desadaptation to the influences of the certain environmental factors. Hence, by the changes of the cardiograms parameters it is possible to judge about the state of the cardiovascular system, estimated mainly by the size of the heart rate, what objectively testify the stress functional state of the animals in response to the changes of the quality of environment.

## **RENT-SEEKING AND THE QUALITY OF ENVIRONMENT: THE CASE OF UKRAINE**

*Anastasiya Salnykova,*

*University of 'Kyiv-Mohyla Academy', Ukraine*

Market failure is inability of market to allocate resources efficiently or more accurately - inability of equaling quantity demanded to quantity supplied. It means that market forces do not maximize social net benefits by equaling marginal social benefits with marginal social costs. Therefore market failure may create a *divergence between private costs and social costs*. This means that society gets not the optimal proportion of produced good and saved environment but gets more products and less environment than it would rather receive.

Here we will concentrate on inappropriate government intervention as the reason of market failure. This is the case when government intervenes in the economy not to correct a divergence between private costs and social costs, but for other purpose, which can even worsen the status quo.

Rent-seeking is one of the causes of inappropriate government intervention. It is the desire to get through the government some material benefits at the expense of society or individuals.

Rent can be granted to the enterprise as subsidies or tax advantages for example.