



Anthropogenic influences on hydrology and biota on the Glinščica stream

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As the size of the urban population was increasing, stream corridors have become more and more physically changed to ensure flood safety and to increase urban surfaces. For this purpose dams, accumulations, banks and other objects on the stream corridors have been built. Besides, riparian vegetation has been removed; river corridors have been straightened and often made of concrete. In comparison with natural streams, physically changed river corridors have different values of physical, chemical and biotic parameters, which influence self-purification capacity of the streams. We were investigating in which way these parameters were modified due to human influenced changes to river streams on five sampling sites on the Glinščica stream. For comparison we took another sampling site on its tributary Pržanec. First sampling site is located in almost unregulated reach, whereas the other four in regulated reach. Last two sampling sites are located in the reach with concrete channel. Depth of the river, water flow and velocity, composition of organic and inorganic substratum, temperature, dissolved oxygen, conductivity, pH, nitrates and phosphates were studied and also samples of periphyton and macroinvertebrates were taken in all four seasons from spring 2005 till winter 2006.

We have found out that downstream water quality decreases with increase of human-caused changes on the stream corridor. Water quality decreases mostly for the insufficiency of shading, which leads to increased water temperature, increased saturation with oxygen and increased pH on sunny summer days. Straightened and concrete river channels cause decreased depth of the river, increased water flow and increased velocity. The main problem for water organisms regarding changing and straightening river channels is that substrate, velocities and depth become homogeneous. This means that there are no different habitats, suitable for different species and that there is no shelter to hide from high velocities, high temperatures and predators. Conditions on the whole corridor are the same and suitable for only few species, so the biodiversity in human-changed river corridors usually declines. All these physical and chemical changes caused by anthropogenic alteration of stream corridors have also different influence on different species of organisms. In ecological part of this study, which was made on Biotechnical Faculty, University of Ljubljana, macroinvertebrates and periphyton in the Glinščica stream were studied. The investigation shows that influence of anthropogenic alteration is much bigger for macroinvertebrates community as for periphyton community. Changes of macroinvertebrates community were bigger from site to site in comparison with the same site in different seasons. Periphyton community shows different result: changes in community were bigger at the same location in different seasons as from site to site. Biodiversity of macroinvertebrates decreases on the sites with concrete channel, but the biggest value of biodiversity is reached almost by all measurements on physically changed site just before the concrete channel starts. Study of periphyton gives results that are even more surprising: the biggest values of biodiversity of diatoms community at spring and summer measurements were on the sites with the concrete channel. This investigation shows that anthropogenic changes on the stream corridor are not necessary negative for all species living in a stream, but if we want to ensure a good water quality, we have to ensure good living conditions for all the water organisms and the organisms living in surroundings of the stream.