| Survey study of biota formed in water areas receiving treated wastewater | | |
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| **Whole term** | **1996.7 - 2001.3** | |

(Purpose)

The spread of sewerage service is raising proportion of treated wastewater to the environmental water in discharged areas. However, the ecosystem formed in the water environment where treated wastewater is majority, has not been fully known yet.

This research aims to investigate a goal of sewerage in order to create various types of aquatic ecosystems by using treated wastewater. This includes understanding of situation of water environment formed by effluent, and discussion on the relation to environmental factors.

(Results)

From 1996, a cooperative research by Sapporo City, Metropolis of Tokyo, and Yokohama City was carried out as entrustment of the Public Works Research Institute, the Ministry of Construction. In 2000, following survey in past years, a survey was performed in the discharge river of six treatment plants and the landscaping water that used treated wastewater.

(1) Survey place and survey period

4 places at n river (A treatment plant); periods: July, September and November
5 places at t river (SK treatment plant); periods: August, November and January
5 places at biotope (O wastewater treatment plant), periods: October, December and January
7 places at biotope and vegetation pond, etc. (Y wastewater treatment plant), periods: September, December and February
5 places at j lake (J wastewater treatment plant), periods: November and December (for biota only in December)
5 places at d bay outlet and d biopark (KG wastewater treatment plant), periods: October, December and February

(2) Measurement items

Measurement items in the field: temperature, water temperature, flux, flow velocity, transparency, electric conductivity, dissolved oxygen
Water quality analysis items: pH, turbidity, SS, BOD, TOC, T-N, O-N, $NH_4$-N, $NO_2$-N, $NO_3$-N, T-P, PO4-P, chlorophyll a, residual chlorine, chromaticity
Attachment analysis items: dry weight, ignition loss, chlorophyll a
Biological survey items: plankton, attached algae, benthos, fish and shellfish, aquatic plants, animalcule

(3) Results and discussions

① Inflow of treated wastewater generally promoted growth of green algae, and increased the numbers of species and individuals of attached algae. The main reason could be increase in nutrients concentrations. The numbers of species and individuals and the diversity index seem to increase when the river bed has more variety like those in natural sites.

② A relation between the concentration of ammonium-nitrogen and the number of benthos was found. However, it is necessary to discuss it considering residual chlorine, hydraulic condition, the organisms' the mode of life of organisms and survey separating the conditions.

③ Information on the hydraulic condition suitable for inhabitation of Hydropsychidae was acquired, but it was still necessary to collect much more data, examine and discuss them considering the mode of life of organisms.

④ In the biota of vegetation purification pond, diatom and blue-green algae as attached algae and Dipteral, and Tubificida as benthos were frequently observed. In the future, the comparison with the biota of pond and only natural river water flow would be required.

(Future tasks)

As future issues, the discussion of diversity index considering species, the discussion of following nature of water quality and pollution index, the experimental survey focusing on specific items, the use effect extent of water quality, and concentration of residual chlorine as indicators should be included.

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| Key words | Reusing treated wastewater, Water environment, Aquatic ecology, Biota |
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