Effects of wastewater from sewage plants on water quality of nearby rivers: A case of Sapporo city

（下水処理場からの排水が近隣の河川の水質に及ぼす影響 ：札幌市を例として）

北海道大学大学院 環境科学院
環境起学専攻 環境適応科学コース
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Introduction

The drainage standard on the sewage and the drainage standard of the river are greatly different. For example, although the standard of *E. coli* is 0.5 – 50 MPN/mL in the river, that in wastewater standard of the sewage treatment plant is 3000 MPN/mL. The sewage treatment facilities in Sapporo city have been installed along a relatively small river, and concern about the influence of sewage drainage on the river environment is feared. In this study, water samples were collected from the upper- and down-stream drainage areas of wastewater from three sewage treatment plants in Sapporo city for 4 times in the period without snow melting effect, and the obtained results have been compared with general water quality.

Methods

All of the samples were collected for June, August, October and December, 2018 from upstream and downstream of the drainage point from the sewer in Sousei, Sin and Mochizukisamu Rivers. TDS, pH, electrical conductivity, COD, nitrite, nitrate, ammonium and phosphate concentration in sample water were measured. Numbers of general bacteria and *E. coli* were calculated using test paper (Shibata Kagaku). Na, K and Ca concentration were measured by atomic absorbance spectroscopy (Hitachi 130-30).

Results and Discussion

All subjects measured were below the wastewater standard value from the sewage treatment plant; however, many subjects exceeded the general water quality standards in the downstream area of the drainage point. There is concern that these declines in water quality have a negative impact on river ecosystems. In these rivers, the flow rate of sewage wastewater may account for more than 50% of the river flow rate; however, in the examples of Yodo River in Osaka and Tama River in Tokyo, the flow rate of sewage wastewater has been reported to be less than few% of that. For maintaining the quality of rivers, sewage treatment plants should be located along large rivers.