

Investigation of the influence on the aquatic organisms including “ Sirouo ” due to the treated wastewater of Tataragawa Purification Center

Whole term

1997. 8 ~ 2000. 3

(Purpose)

Since 1993, that a kind of fish called Sirouo, ice goby(*Leucopsarion Petersi*) of Fukuoka has been coming back to the Tatar River, the discharge point of treated water from the Tataragawa Purification Center, draws concerns on the water environment in the local community. The chlorine disinfection method widely used in many treatment plants could harm the organisms living in this discharge point that is close to the spawning site of Sirouo, thus the ultraviolet disinfection method was introduced.

This joint research performed by the Fukuoka Prefecture and the Japan Institute of Wastewater Engineering Technology from 1997 to 1999, aimed at a clear identification of the influence of the ultraviolet disinfection on aquatic organisms represented by Sirouo.

(Results in 1999)

(1) Acute toxicity test on freshwater fish

The 96-hour acute toxicity test on Oikawa(*Zacco platypus*), typical freshwater fish in the Tatar River was performed for quantitative understanding of the influence of ammonia, residual chlorine and nitric acid ion.

According to the lethal concentration 50 (LC₅₀) estimated using the test results, the existing concentration in the treated wastewater, which was below the quantitative limit did not have direct impact on Oikawa; however a direct comparison with the concentration in the treated wastewater was not available.

(2) Experiments of the influence on freshwater fish, using treated wastewater

The aeration tank test to investigate the influence due to the ultraviolet-disinfected water in Tataragawa Treatment Center was performed using minnows. The experimental cases using treated wastewater concentrations of 25%, 50% and 100% and a comparative case of using diluted water were selected.

The death rate of every case for 7-day aeration was 0~10% which in turn concluded that the ultraviolet disinfected treated wastewater had almost no influence on minnows.

(3) Experiments of the influence on adult Sirouo, using treated wastewater

The same experiments as above were performed using Sirouo.

The death rate of every case for 7-day aeration was 0~10% which in turn concluded that the ultraviolet disinfected treated wastewater had almost no influence on Sirouo.

(4) Experiments of influence on Sirouo' s egg, using treated wastewater

The same experiments were performed using Sirouo' s eggs.

The total death rate was 10.3~13.5 % and the difference between the experimental and control cases or the proportional relationship between the two cases were not observed for the period immediately after hatching of spawns (approximately 31 days) which in turn concluded that the ultraviolet disinfected treated wastewater also had almost no influence on Sirouo' s eggs.

(Summary)

As per the investigation from 1997 to 1999, the existing concentration of ammonia, residual chlorine and nitric acid ion in the treated wastewater did not have direct influence on adult Sirouo, Sirouo' s eggs and minnow. Also, the ultraviolet-disinfected treated wastewater did not have direct influence on adult Sirouo, Sirouo' s eggs and minnow.

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Keywords

UV disinfection, Ice goby, Toxicity test