Application of Lake Wetland Ecological Rehabilitation Technology in Environmental Pollution Control and Ecological Rehabilitation

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Abstract. With the continuous development of the economy, environmental pollution has become more and more serious, especially water pollution. During and after the "Eleventh Five-Year Plan", China's environmental protection and ecological construction and restoration work will be fully carried out. Among them, water pollution control, air pollution, solid waste pollution, heavy metal pollution, radioactive pollution control, and desertified land control are environmental protection and ecological, one of the very important contents of environmental construction. The purpose of this article is to study the application of lake and wetland ecological restoration technology in environmental pollution control and ecological restoration. Commonly used domestic lake pollution treatment methods include: microbial method, dredging and salvage, chemical sedimentation (flocculation), physical measures (filtration and membrane), constructed wetland, reoxygenation (micropores, turbulent aeration), mechanical dilution transfer (flushing) Water, water change) etc. The microbiological method is to put in microorganisms, the use of microbial preparations can digest and degrade organic pollutants and remove the purification mechanism of ammonia nitrogen and phosphorus, so as to achieve the goal of various water pollution control. And its disadvantage is that it can't last forever. Ecosystem restoration project: It is the process of using engineering technology to assist the restoration of an ecosystem that has been degraded, destroyed, newly built or rebuilt. Its application enables the ecosystem to be restored and strengthened in terms of its own health, integrity and sustainability. Once the ecological restoration project is completed, the ecosystem does not need to be maintained by humans, as long as it is prevented from degrading due to disturbance. This is similar to the microbiological method in the lake and wetland ecological restoration technology.

Keywords: Lake Wetland Ecological Restoration Technology, Ecological Restoration, Environmental Pollution, Environmental Governance

1. Introduction
The environmental conditions of the water area are related to the survival and health of the surrounding people and the overall quality of the area. Water environment management based on
vegetation ecological restoration technology is to effectively reduce water pollution to ensure the degree of pollution, while establishing a self-digesting and self-circulating system of pollutants. The combination of vegetation configuration and landscape also improves the ornamental value of the entire water area, maximizing. Realize the improvement and promotion of the regional water environment and even the overall landscape environment of the region [1]. For the water environment, the analysis of the relevant principles of vegetation ecological restoration, the textual research on the problems existing in the research practice, and the summary of the specific application methods of the technology will help the scientific research in the future, and the systematic water pollution control will provide certain help [2].

Aquatic plants are organisms between water and mud, water and natural gas, and water and land. They play an important role in the material cycle of the ecosystem and have a good purification effect. They are the foundation for establishing a good lake ecology. Aquatic plants can compete with algae when using nutrients. The roots of some large aquatic plants can also secrete algae substances, which greatly reduces the density of phytoplankton and chlorophyll a, and has different effects on inhibiting the growth of algae. Aquatic plants absorb nitrogen and phosphorus. If you choose high-quality aquatic plants to remove nitrogen and phosphorus from the lake, it will have a significant effect. Therefore, the restoration of aquatic vegetation is of great significance to the restoration of lake and river ecosystems [3-5].

This paper studies the application of ecological restoration in environmental pollution control by studying microbial technology in lake wetland ecological restoration technology. At present, microbial technology has been widely used by people for water purification and restoration technology. The main method is to use artificially prepared specific carriers to provide a living micro-environment for microbial preparations, so it is introduced into the aquatic ecosystem to strengthen the repairing capacity of water bodies.

2. Methods

2.1 Lake Wetland Ecological Restoration Technology
Currently, there are three main types of microbial remediation methods used in river water treatment: biological enhancement technology, biological membrane technology and biological growth promotion technology. In fact, bioaugmentation technology is a technology that introduces exogenous microorganisms and has been widely used in aquaculture and agriculture. It mainly adds appropriate photosynthetic bacteria, nitrifying bacteria and other microbial agents to polluted rivers to accelerate the degradation of pollutants in the water and improve the self-purification energy of water bodies. Biofilm technology is a water purification technology based on the self-purification function of water in nature and the purification of pollutants by soil. This technology allows microorganisms to be adsorbed to the surface of the carrier in the form of a membrane, thereby contacting sewage. The microorganisms on the biofilm can absorb the nutrients of the organic matter in the sewage, so as to achieve the purpose of purifying water quality. At present, my country's river improvement technology is backward and the water quality treatment rate is low, but the biofilm technology has the characteristics of strong purification function, convenient operation and easy management, and has a broad development space in the river ecological management [6-8]. Biological growth promotion technology is to add appropriate microbial growth promoters to polluted rivers to accelerate the growth of local microbes in the water, enhance the self-purification ability of the water environment, and realize the decomposition of organic pollutants.

2.2 Microbial Remediation Technology
First, improve the environmental conditions of the base, including: interception of external source pollution, reduction of internal source load; flow field reconstruction, wave reduction; increase luminous flux, remove large aquatic animals; water body segmentation, sediment and shoreline modification. Secondly, a food web chain is constructed. Nutrients in the water are transferred from
low level to high level through the form of food web chain, and finally leave the water body. Including: the expansion of microbial populations and the improvement of the environment; the regulation of fish population structure and density. Then control the sediment-water nutrient exchange. One of the main reasons for the formation of the turbid water state is that the sediment-water layer acts violently and the nutrient salt exchange flux is large. Including: expansion and expansion of oxygen-releasing biota; regulation of water filtration functional group; expansion and expansion of scraping biota. Finally, build aquatic vegetation communities. Including: construction of emergent plant communities in coastal zone; restoration of floating-leaf plant communities in coastal zone; construction of submerged and floating plant communities. The use of ecosystem construction technology to improve water quality is a new type of engineering technology; after the completion of the project, the response of the system is extremely intense within a certain period of time. Only through a large number of professional manual interventions can the water ecosystem be made safe and stable [9-10].

3. Experiment

3.1 Ecosystem Restoration Project

When implementing vegetation ecological restoration technology, the difference in the degree of water pollution will lead to different restoration effects. Generally, the higher the concentration of pollutants, the more difficult it is to restore vegetation ecological restoration techniques. When the water environment is extremely polluted, it will directly affect the normal growth of vegetation and eventually lead to plant death. At this time, the ecological restoration technology of vegetation will be cancelled, which will play an effective role in restoring the water environment. When the concentration of pollutants in the water is too low, the vegetation absorption effect is not obvious, which will affect the restoration effect to a certain extent. Now, it is time to adjust the technical measures that should be adopted to deal with water pollution in other ways. Therefore, when selecting vegetation ecological restoration, before using remedial technology for water environment treatment, a reasonable analysis of the local water environment pollution index must be carried out, and the data results guide the formulation of water pollution control plans.

Using microbial remediation technology to control environmental and ecological pollution can not only reduce the use of chemical substances, reduce additional pollution, and reduce the production of harmful substances. Therefore, microbial remediation technology is an important means of ecosystem restoration engineering. Through the use of microorganisms, the ecological self-repair ability can be improved and a reasonable ecological environment structure can be established. Because microorganisms degrade pollutants in lakes and purify river water.

In addition to wastewater pollution, oil pollution to water bodies is also very serious. 1.5 million tons of crude oil flows into the world waters during the annual transportation. At the same time, in recent years, crude oil and various refined petroleum products are discharged on land or into waters. It is because the oil tanker was killed or the operation of offshore drilling was out of control, which caused a large-scale oil spill and polluted the water area. Eliminating water pollution caused by oil is also a major focus of environmental pollution control. It is economical and quick to treat oil pollution with microorganisms. About 6000 gallons of gasoline leaked underground in a village in Pennsylvania, USA, which seriously polluted the water source and affected the water supply. Initially, the person responsible for the accident, SanOil, used the method of digging wells to extract oil, that is, digging deep wells that can drill groundwater, and pumping gasoline floating on the surface of the water, using this method to remove about 3,000 gallons. But if the remaining gasoline is still removed by this method, it is estimated that it will take another 100 years. In unavoidable circumstances, it was decided to use the method of cultivating local bacteria capable of decomposing gasoline to solve the problem, thus successfully purifying. The method of microbial purification of oil will be one of the main methods of environmental governance in the 21st century.
4. Discussion

4.1 Measuring the Nutrient Content of Wetland Plants
The dense branches and leaves of submerged plants have a large contact area with water, which can absorb suspended particulate matter in the precipitation. Some species can also secrete coagulation aids to promote the flocculation and sedimentation of small particles in the water. Secondly, wetland plants need to absorb a large number of elements during their growth and development. Root plants directly remove nutrients such as nitrogen and phosphorus from the bottom mud, while floating plants remove nutrients from the water. In addition to nutrients that can be absorbed by plant growth, wetland plants can also accumulate large amounts of certain metals in their bodies. Cattails are enriched in high concentrations of nickel but have no signs of being poisoned. It can enrich up to 80μg/g of copper before slowing down leaf growth and reducing biomass. Third, wetland plants provide a good environment for the survival and reproduction of microorganisms in the wetland. Microorganisms often play a central role in the biogeochemical cycle of wetland nutrients. They are the first biological group that appears in various types of sewage and absorbs and degrades pollutants. The numerous microbial populations and numbers in the constructed wetland provide enough decomposers for the constructed wetland sewage treatment system, and the number of microorganisms in the system is significantly positively correlated with the purification effect. In this, plants play an important role. Plants can release secretions such as sugars, phenols, and acids into the soil, and the rapid decomposition of fine roots also replenish organic carbon for the growth of microorganisms.

Table 1. Test results of nutrient content of wetland plants

| Number directly | The name of the plant | Total nitrogen/g*kg⁻¹ | Total phosphorus/g*kg⁻¹ | Total potassium/g*kg⁻¹ | Total carbon/% | Moisture content/% |
|-----------------|-----------------------|------------------------|-------------------------|------------------------|---------------|-------------------|
| ZW1             | Alternantheraphioloxides| 11.4                   | 1.18                    | 18.34                  | 36.1          | 82.17             |
| ZW2             | Lee's wo              | 17.4                   | 2.00                    | 16.63                  | 38.0          | 80.32             |
| ZW3             | Jiao grass            | 14.8                   | 1.13                    | 15.79                  | 40.7          | 72.10             |

Plants selected for planting in wetlands should have the ability to tolerate moisture, drought, and pests. Different plants have different adsorption capacity of Wu'an Wu in the environment, that is, different water purification capacity. Selecting plants suitable for wetlands can not only restore plants, but also restore microorganisms for the environment. When the ecosystem in the environment is stable, there will be microorganisms to maintain the balance of the ecosystem. While plants and microorganisms coexist mutually beneficially, they also provide certain restoration effects for the environment. Therefore, it is necessary to select suitable plants for planting. As shown in Table 1, measuring the nutrient content of wetland plants is helpful for selecting suitable plants.

4.2 Microbial Treatment of Environmental Pollution
The existence of wetland root plants is conducive to the deep expansion of microorganisms in constructed wetlands. It can be seen that as plant roots expand downward, microorganisms also expand downward. The oxygen transport of aquatic plant plants and roots promotes the growth and reproduction of microorganisms in the deep matrix. Strengthen the sewage purification effect at the bottom of the wetland. The penetration effect of plant roots on the substrate, the horizontal and vertical expansion of the root system, form many tiny air cells or gaps in the substrate, which reduces the sealing of the medium, enhances the porosity of the substrate, and obtains the hydraulic conductivity of the substrate. Enhanced. Dead plant roots can also form relatively large gaps in the constructed wetland matrix, increase the hydraulic conduction of the constructed wetland, and promote the interaction between sewage, plants and the matrix.
In this paper, a sewage ditch in a certain city was repaired by microbial technology. After a period of time, in order to investigate the effect of restoration, the nearby residents were surveyed and asked whether the peculiar smell of the water ditch had improved. The results are shown in Figure 1. Most residents feel that the odor has been reduced a lot and are satisfied with the repair results. It shows that the microbial remediation technology has a certain effect.

5. Conclusions
Environmental protection is not only related to people's living environment, but also affects economic development. In this paper, the application of microbial technology to the treatment of environmental pollution is studied by studying lake wetland restoration technology and the restoration effect of wetland plants on lakes. Plants themselves can carry out photosynthesis, which can provide certain favorable conditions for the survival of microorganisms through photosynthesis. The joint treatment of the environment through plants and microorganisms will restore the balance of the environmental ecosystem and accelerate the progress of environmental governance. The quality of the environment is closely related to our lives. Only when the environmental conditions are good can our quality of life be guaranteed and improved. In addition to treating the environment from a professional perspective, we must also protect and care for our living environment through our own perspectives such as not littering, not cutting and logging. Microbial technology has a fast remediation effect and little impact. It is worthwhile for us to study its deeper use and application to environmental treatment to improve environmental pollution as soon as possible. This shows that microbial remediation technology will become one of the important technologies for environmental governance.

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