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LETTER TO THE EDITOR

The Influence of Cruise Tourism Dining Waste on the Process of Self-recovery of Natural Ecological Environment

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Cruise tourism meal waste is one of the important sources of marine ecological pollution. The influence of cruise tourism meal waste on the process of natural ecological environment self-recovery is analyzed. This paper analyzes the harm of cruise waste to natural ecological environment from two aspects: the influence of cruise waste on environment and biology and the influence of cruise waste on human activities and health. The basic principle of marine ecosystem restoration and reconstruction is analyzed. According to this principle, the restoration process of natural ecological environment is analyzed from the aspect of marine species. It is found that cruise tourism dining garbage plays an important role in hindering the process of natural ecological environment self-recovery. The choice of ways to restore and reconstruct the marine ecological environment is given, which contributes to the sustainable development of the natural ecological environment.
Cruise ship meal garbage; Marine ecology; Restoration; Harm

1 INTRODUCTION

Cruise tourism has developed rapidly, and cruise pollution has become a hot spot in recent years. Cruise ships have a capacity of several thousand people. In each voyage, there are tons of garbage, more than 50% of which are kitchen waste. If these garbage are not properly treated, it will have a serious impact on the marine ecological environment and the health of the people on board. At present, all the kitchen waste disposal equipment used on cruise ships are imported products, but most of the kitchen waste processors produced in our country are small kitchen processors, which are not suitable for cruise ships (Mi et al. 2015, Shen et al. 2017). Cruise ship garbage will cause serious visual pollution to marine landscape, affect the health of marine ecosystem, and may threaten the safety of navigation, and then have a negative effect on the marine economy. As a result of the cross-border movement of cruise ship waste, which covers a wide range and has an increasing adverse impact on the marine environment, to this end, the monitoring and evaluation of cruise ship waste has been strengthened, the study on the influence of cruise tourism meal waste on the process of natural ecological environment self-recovery has become an important task of marine environmental protection under the new situation (Wynnehughes 2015).

Murat Tosunoglu, Nilgun Yilmaz, Cigdem Gul published an article in the journal Ekoloji Issue 78 in 2011 entitled: ”Effects of Varying Ecological Conditions on the Blood Parameters of Freshwater Turtles in Canakkale (Turkey)”, the effects of water characteristics (dissolved oxygen, pH, conductivity and temperature) on freshwater turtles (Emys rotunda and woolen tortoise) are investigated (Tosunoglu et al. 2011). The blood parameters

collected from different locations in Channakkale, Turkey, and the changes of survival blood parameters in wet and dry periods were put forward. According to the water quality of its biological community, the red blood cell and white blood cell count of Aedes albopictus, as well as the difference of red blood cell and white blood cell count, such as average cell volume (MCV) and average cell hemoglobin (MCH) value, were measured. In Aedes albopictus, the contents of total protein and urea in dry stage and wet stage were different in biochemical sense. Based on the above research, the influence of cruise tourism meal waste on the process of natural ecological environment self-recovery was analyzed.

2 IDEA DESCRIPTIO

2.1 Harm of cruise tourism dining garbage

2.1.1 Impact of cruise waste on environment and biology

Cruise ships navigating at sea or inland rivers, waste oil and other wastes generated are discharged to the sea or rivers, causing serious pollution to the water environment, which has great impact on biology and ecosystem. If cruise waste is simply discharged into the sea, it can pose a fatal risk to living things in the sea, such as fish, seabirds and mammals in the sea. The number of deaths caused by ingestion of garbage is increasing year by year (Munguia-Vega et al. 2015).

In addition, most of the cruise waste is kitchen waste, which is organic waste. After comminuted, the kitchen waste will be discharged directly into the water, and the dissolved oxygen in the water will be consumed at the same time. This situation will greatly affect the self-purification function of the water body. These organic wastes often contain many harmful bacteria that cause marine microbes to multiply and destroy the ecological balance of the oceans, creating conditions for the spread of animal and plant epidemics and human infectious diseases (Zhang et al. 2015). Some ship garbage is mixed into seawater for a long time and gradually transformed into substances harmful to the marine environment. These harmful substances can destroy the feeding and digesting functions of the organism and endanger the growth of aquatic organisms. At the same time, the garbage suspended on the water body and along the coastline will gather in the harbor, beach and both sides of the river with the fluctuation of tide, which will affect the environmental hygiene of the water area, damage the beautiful value of the environment, and pile up the garbage so that the water body will deteriorate and stink.

2.1.2 Effects of cruise waste on human activities and health

If the cruise waste is not properly disposed and stored, it will cause secondary harm, pollute the environment on the cruise ship, and pose a threat to the health of the passengers on the cruise ship. Some substances in cruise ship kitchen waste are not easy to decompose and eliminate after being discharged directly into the ocean, which will not only cause harm to marine life, but also enter the human body through the food chain through biological enrichment, in which toxic substances will infringe on human health.

If the cruise garbage is simply discharged into the sea, it will cause significant damage to the coastal countries and regions. It mainly includes the increase in the cost of marine debris used by coastal countries to remove water in the water, and the cost of fishing is also increasing (Li et al. 2017). In addition, cruise garbage will also cause harm to ship navigation, garbage in water will threaten the normal operation of propellers, and bring risks to navigation safety. Cruise garbage will also destroy the aesthetic value of the marine environment and affect the public perception of the environment, which will lead to the decline of cruise tourism revenue.

2.2 Basic principles of marine ecosystem restoration and reconstruction

In recent years, the research and practice of restoration and reconstruction of degraded ecosystem has become a new subject-restoration ecology. Restoration ecology is mainly the science of studying the mechanism of ecosystem degradation, the technology and method of restoration and reconstruction of degraded ecosystem and its

ecological process and mechanism. According to the theory of restoration ecology, natural or artificial auxiliary measures in a given period can promote the restoration of degraded ecosystems and, to a certain extent, return to the normal or higher level of pre-degraded ecosystems along the desired direction. Or it can be rebuilt on the basis of the status quo of degradation and reached the same level as the pre-degraded ecosystem. From the perspective of restoration ecology and systems science, the key link of ecosystem restoration and reconstruction is the reconstruction of rational system structure, the restoration of system functions and the restoration, reconstruction and improvement of ecological potential (Gao et al. 2018).

Restoration and reconstruction of marine ecosystems is based on biodiversity, using the nutrition chain as a network, restoring different levels of ecological chains in appropriate sea areas, and rebuilding the integrity of marine ecosystems, thereby enabling the recovery and improvement of marine ecosystem productivity.

2.2 The influence of cruise tourism dining waste on the process of self-recovery of natural ecological environment

The ecosystem recovers gradually after it is polluted. Recovery itself is also an indirect body after the system is polluted. The long-term effect of cruise garbage pollution is also reflected in the speed of system recovery. Although there are many criteria for defining the system to be contaminated by cruise tourism waste, the most common use is to see if the species changes in the system have returned to the natural changes before the pollution, including species replacement and replacement.

Cruise garbage refers to various food wastes, domestic wastes, operational wastes, all plastics, cargo residues, incinerator ash, cooking oil, fishing gear and animal carcasses that need to be processed continuously or regularly, and whcih arise during the normal operation of the ship. Cruise food waste is a kind of food waste formed by cruise passengers in the course of food and beverage. It is very perishable and stinky, can spread bacteria and viruses, and can directly affect the growth and reproduction of marine microorganisms. After being polluted by cruise tourism and dining waste, the restoration process of natural ecological environment is as follows:

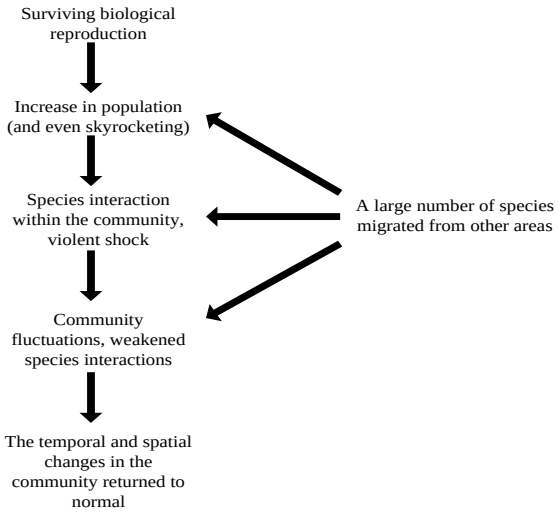

Fig. 1 Recovery process of natural ecological environment

After being polluted by cruise tourism waste, some sensitive species, such as limpets, disappeared and some algae with short growth period proliferated. Afterwards, the herbivorous bio-capricorn gradually appeared, preventing algae from further breeding through feeding. After the increase of the number of capped shellfish, the number of algae will be restored to a certain extent because of the limited amount of food, so that the population stability and balance can be achieved through the interaction between species, and finally even the whole

population. It can be seen that cruise tourism dining garbage plays an important role in hindering the process of natural ecological environment self-recovery.

3 RESULTS

Options for the restoration and reconstruction of the marine ecological environment:

3.1 Create “seabed forest”

"Submarine forest" refers to seaweed community, which is a very active family of marine ecosystem. The organic matter it produces provides primary productivity for the whole marine nutrient chain, and algae absorbs a large number of nutrients such as carbon, nitrogen, phosphorus and so on in the process of algae growth. The eutrophication process of water area is restrained. Therefore, marine ecological reconstruction must protect and vigorously build forests in the sea and build artificial algae farms.

3.2 Special rescue and artificial domestication and propagation of endangered marine species

Establish a marine wild animal and plant domestication and breeding, ambulance base and rapid response mechanism for ambulance, and timely rescue, suspend and release the endangered marine wildlife that have been caught, injured, stranded and punishable. In addition, special protection plans and special protection measures should be made according to the biological characteristics of endangered marine wildlife. To establish an artificial domestication and reproduction base for endangered marine wildlife. The core technology of artificial domestication and reproduction is studied and developed to strengthen the artificial breeding of marine wild species protected by the state.

3.3 Establish marine wildlife and typical marine ecological nature reserves

In the marine wild flora and fauna distribution area, choose wild plants and typical ecological nature reserves. On the basis of investigation and research and demonstration, we will gradually establish a nature reserve system with reasonable layout and complete types. The aquatic germplasm resources with high economic value and genetic and breeding value were protected in situ, and a protected area of aquatic germplasm resources was established in the main growth and breeding areas. Implement habitat protection, protect rare species and ecological diversity, and focus on protecting marine life against major endangered species. Implement ex situ conservation and adopt ex situ conservation measures for species whose habitat is seriously damaged. Strengthen the management capacity of protected areas, complete the management facilities of nature reserves, and steadily improve the standardized, scientific management level of spawning grounds, feeding grounds, fattening fields, migratory passages and wintering fields.

3.4 Strictly implement the ecological compensation system for engineering construction

We should perfect the system of ecological environment impact assessment in the sea area of engineering construction projects, establish the ecological compensation system of engineering construction, and ensure that the damaged aquatic biological resources and aquatic ecosystems can be compensated and repaired accordingly.

3.5 Reduce pollution sources

Strictly control the random discharge of cruise tourism meal waste, organize the recovery of cruise tourism meal waste, and reduce the damage degree of marine ecosystem from the source of pollution.

3.6 Strengthen monitoring of the marine environment

As an important part of the national environmental monitoring network, the Marine Environmental Monitoring Network has now built an omni-directional and multi-element stereoscopic monitoring system that combines satellite, airborne remote sensing with marine and land station networks. Together with the land environmental monitoring network, an effective environmental monitoring system from basin to ocean has been

formed. The monitoring of key estuary, port, key sea area, important fishery waters and red tide should be further strengthened.

4 DISCUSSION

In recent years, the Asia-Pacific region has become a global cruise tourism area. It is the younger and fastest-growing after North America and Europe. It is mainly manifested in the rapid development of modern tourism and the rapid promotion of cruise industry, mainly based on the continuous development of tourism resources and the construction of cruise professional ports. At the same time, in the cruise tourism market, the scale of its tourist market is also expanding, among which the most important tourist market and destination is China.

As an emerging tourism project, cruise ships are receiving more and more attention, especially for marine environmental pollution. Cruise ships carry hundreds of people and thousands of people, the amount of garbage generated by so many people every day will be beyond imagination. According to statistics, about 50 tons of garbage will be produced during a week of cruise sailing. If the garbage is not properly disposed of, it will have a great impact on the marine environment and the health of people. Water is the source of life, and the protection of marine ecological environment is a problem worthy of people's attention. It is necessary to appeal to the world to protect the marine ecosystem.

5 CONCLUSION

More and more attention has been paid to the marine ecological problems caused by the pollution of cruise tourism meal garbage. This paper studies the influence of cruise tourism meal waste on the process of natural ecological environment self-recovery, and gives the ways to restore and reconstruct the marine ecological environment. In the future, it is necessary to study in depth the principles and technologies of restoration and reconstruction of damaged marine ecosystems, in order to formulate more scientific and reliable restoration schemes to restore some or all of the contaminated areas to their original basic ecological functions.

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