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Damage of Oxybenzone in Sunscreen to Coral Reefs

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Abstract: Coral reef is a kind of reef, which is distributed in the warm shallow sea. It is made up of coral skeleton. Different coral individuals are bound together by connecting substances and live in groups for generations. Coral reefs provide spaces of different sizes, where many fish, shrimps, shellfish, algae and other kinds of marine life inhabit, grow and multiply. Cryophyte is symbiotic in polyps. Yellow algae is an algae plant, which absorbs sunlight and provides nutrients for corals through photosynthesis. Global warming will cause the sea level to rise, which will seriously threaten the survival of corals. In addition to the vicious impact of global warming on the marine ecological environment, oxybenzone in sunscreen and other skin care products has been detected in marine and freshwater entertainment areas, and oxybenzone will accumulate in aquatic animals and degrade into toxic substances. This paper analyzes the main causes of coral reef destruction, and puts forward corresponding protection measures.

Keywords: Coral reef; Benzophenone; Sunscreen; Destroy; Protect.

1. Introduction

Coral reef is a kind of reef, which is distributed in the warm shallow sea. It is made up of coral skeleton. Different individuals of polyps live in groups for generations by connecting substances. After the previous generation of polyps dies, the new generation of polyps will continue to thrive on their remains [1]. Over time, generations of polyps continue to grow and become beautiful scenery lines in the sea. Coral reefs are of various shapes and colors, in which more than one third of the species of fish on the earth live, as well as thousands of another marine lives [2]. Human activities and global warming threaten coral reefs. Coral reefs provide spaces of different sizes, where many fish, shrimps, shellfish, algae and other kinds of marine life inhabit, grow and multiply. After a long time, the coral reef will grow to more than 30 meters high, but in fact only a thin layer of coral on the surface is alive. As the coral grows taller and taller, the corals at the bottom die, and new corals are regenerated on them [3]. The surface of coral is covered with soft, cylindrical polyps, which are about the size of rice grains. Chrysophyta is symbiotic in polyps. Yellow algae is an algae plant, which absorbs sunlight and provides nutrients for corals through photosynthesis. Corals living in the ocean are as sensitive to sunlight as humans. Different from human skin, coral contains a kind of protein, which can not only prevent the damage of ultraviolet rays, but also make the coral appear colorful and colorful.

Global warming will cause the sea level to rise, which will seriously threaten the survival of corals. Corals have strict requirements for sunlight. If the sea level rises, it will be difficult for them to absorb enough sunlight even if they grow at the fastest speed. Global warming also causes the sea water temperature to rise [4]. According to some scientists' speculation, even if the water temperature only rises by 2 degrees Celsius, it will have a devastating impact on corals [5]. Global warming will also reduce coral resistance, and they are more likely to get sick and die. Coral bleaching is a kind of coral disease, which is caused by the forced departure or death of zooxanthellae in coral, which may be caused by rising water temperature, pollution, infectious diseases and environmental changes [6]. Corals that lose chrysosporium will turn white and eventually die. In addition to the global warming's vicious impact on the marine ecological environment, oxybenzone in sunscreen and other skin care products has been detected in marine and freshwater entertainment areas, and oxybenzone will accumulate and degrade into toxic substances in aquatic animals [7]. Benzophenone is a synthetic compound, which can absorb ultraviolet rays, so it is used as a member of sunscreen. It also appears in moisturizers and lipsticks with sunscreen function. Researchers say that in warm waters, if the concentration of oxybenzone reaches about 400 ppt for several days, it is enough to lead to coral formation.

2. Main causes of coral reef destruction

Global warming is the primary culprit leading to the extinction of corals. Because the ocean can also absorb carbon dioxide in the air, but it also makes the acidity of seawater increase. This will weaken the coral's ability to turn their bones into calcareous, thus causing them to be unable to continue growing and die. At the same time, due to global warming, excessively warm sea water will erode the surface layer of coral, which will have a bleaching effect. These symbiotic algae are very sensitive to the changes of seawater environment. When seawater temperature rises, marine pollution and biological species change, these algae can't work normally, and even produce substances harmful to corals. Therefore, coral and symbiotic algae will be separated from each other, and the energy source of coral polyps will disappear immediately, resulting in the "cut-off" situation, resulting in coral polyps cannot survive until they die. Without algae rich in pigment, coral will slowly restore the original white color of limestone, that is, coral whitening (see Figure 1). A research report pointed out that sunscreen used by tourists all over the world is the main cause of coral bleaching. The study found that even a small amount of sunscreen used to protect skin can whiten coral reefs. In fact, oxybenzone in sunscreen and other skin care products has been detected in marine and freshwater recreation areas, and oxybenzone will accumulate in aquatic animals and degrade into toxic substances.

Figure 1. Coral bleaching

Experiments in several sea areas show that even a very small amount of sunscreen can cause a large amount of coral mucus to ooze out within 18 to 48 hours, and completely whiten the coral within 96 hours. It is the permanent and absolute protection of coral reef resources, not the ultimate goal of mankind. Coral reef is not only a biological resource, but also an ecological resource. In the past, the exploitation and utilization of coral and coral reef mainly focused on its physical and biological value, which was inevitably destructive and therefore unsustainable. The unique protein of coral provides a new sun protection scheme, but it is this new scheme that kills more corals. In fact, many cosmetics contain ingredients from animals and plants. The cream or shampoo we use may include plant extracts, such as lavender and tea tree oil, which will appear in many soaps and cosmetics. If we expand the breadth and depth of the exploitation and utilization of marine living resources, and focus on the ecological significance and utilization value of coral reefs, we will open up a newer and broader field in the sustainable exploitation and utilization of tropical marine living resources.

3. Protection and sustainable use of coral reefs

3.1. Establish the protection coordination mechanism of the Reserve

We should strengthen the infrastructure of biodiversity conservation, carry out the background investigation and cataloging of biodiversity, strengthen the scientific research capacity building of coral reef biodiversity conservation, carry out innovative research on the technical methods of coral reef biodiversity conservation and utilization, and further strengthen the monitoring capacity building of coral reef biodiversity. The management organization of protected areas is a professional department responsible for ecological protection in protected areas, and the management of social affairs in protected areas should be undertaken by the corresponding government functional departments. While the surrounding communities pay a certain price for the establishment and management of protected areas, protected areas should make due contributions to the development of surrounding communities. Tourism development in protected areas should take into account the needs of popular science propaganda, and simultaneously carry out public environmental education in combination with eco-tourism to enhance public awareness of environmental protection.

Establish a modern coral reef management system and apply new knowledge and technology to management practice. With moderate development, we can promote the development of resources, improve the level of management and construction. Vigorously carry out the capacity building of coral reef applied research, and carry out projects such as dynamic monitoring of coral reef ecological status, establishment and maintenance of coral reef database, etc. Special marine protected areas refer to areas with special geographical conditions, ecosystems, living and abiotic resources and special requirements for marine development and utilization, which need to take effective protection measures and scientific development methods for special management. We should establish coral reef biodiversity conservation partnership, widely mobilize the enthusiasm of domestic and foreign stakeholders to participate in biodiversity conservation, give full play to the role of non-governmental public welfare organizations and charities, and jointly promote biodiversity conservation and sustainable utilization.

3.2. Sustainable use of coral reefs

Because of its complex and diverse terrain, coral reefs provide a good habitat, shelter and breeding place for many small and medium-sized fish. Therefore, various dense fish groups, sometimes up to thousands, can often be seen in coral reef areas, forming coral reef fishing grounds. If we consciously use the ecological characteristics of coral reefs to provide habitats, shelters and breeding places for fish and other marine organisms, we can carry out artificial breeding of precious marine products in coral reef areas, and put coral reef-loving marine organisms in certain areas, and take appropriate isolation, proliferation and other management measures, then we can develop high-yield and stable-yield marine pastures, and have no adverse effects on coral reef resources. The picture shows coral reefs and fish schools.

Figure 2. Coral reefs and fish schools

Coral reefs composed of reef-building corals and calcium carbonate bones left by other biological communities have relatively strong physical characteristics, which can effectively resist the impact of strong winds and waves, thus forming a good protection for coastal landforms, trees and coastal artificial buildings on the reef edge. Therefore, when people build coastal engineering projects, they can consciously use the physical property of coral reefs and build them within the scope of wind and waves protection, which can not only effectively avoid the attack of marine natural disasters, but also reduce the engineering cost. The established coral reef nature reserve and its exhibition hall can be used to publicize and educate primary and secondary school students and coastal residents on marine ecology knowledge and marine environmental protection knowledge. At the same time, scientific research and experiments can be carried out on the restoration and development of damaged coral reef resources in some areas, and domestic and foreign scientific and technological exchanges and cooperation in this

field can be carried out.

4. Conclusions

The ecological utilization value of coral reef resources is gradually recognized and accepted by people. When people have a great demand for a certain species or a certain part of the species, they will kill or cut down at all costs until the number of these creatures is close to extinction. Coral can also protect coastline from wind and waves. A healthy coral reef can absorb more than 90% of the waves, so protecting coral is actually protecting human beings. We should strengthen the infrastructure of biodiversity conservation, carry out the background investigation and cataloging of biodiversity, strengthen the scientific research capacity building of coral reef biodiversity conservation, carry out innovative research on the technical methods of coral reef biodiversity conservation and utilization, and further strengthen the monitoring capacity building of coral reef biodiversity. Coral reefs should coexist with human beings in terms of ecology, biology, economics and aesthetics. Therefore, we should establish coral reef biodiversity conservation partnership, widely mobilize the enthusiasm of domestic and foreign stakeholders to participate in biodiversity conservation, give full play to the role of non-governmental public welfare organizations and charities, and jointly promote biodiversity conservation and sustainable utilization.

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