The Application of Microorganism in Inhibiting the Propagation of Marine Polluted Seaweed

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Abstract: Marine microorganism is a kind of organism that can grow and propagate in the marine environment. They have small cells, single cells or multicellular or acellular structures. Many marine microorganisms are divided into three categories according to their structure, morphology and composition. From the point of view of Microbiology and environmental microbiology, marine microalgae should be classified as marine microorganisms. Microorganisms are widely used in the prevention and control of environmental pollution, such as wastewater treatment, and play an important role in agriculture, forestry, animal husbandry, fishery and environmental protection. In recent years, there are more and more reports on the distribution, isolation, refinement and development of microorganisms in the environment including domestication and genetic operation. With the development of environmental microorganism and marine science, the research of marine microorganism is becoming more and more popular. In addition, the virus of marine plankton is generally considered to be difficult to study, and overseas research is proceeding rapidly. It penetrates into different depth forms, classification, ecological impact, population and material cycle of marine ecosystem. Algae and phages.

1. Introduction

The ocean is an important part of the earth life support system and the precious wealth of human survival and development. Now, the marine environment is deteriorating and marine disasters are becoming more and more serious. China is one of the most serious countries in the world [1]. In addition to discharging pollutants directly to the ocean, pollutants generated by human activities can also enter the ocean through river outflow, atmospheric diffusion, rainfall, snowfall and precipitation. The sea has become the ultimate destination for many pollutants. In the past ten years, with the rapid development of industry and agriculture, the corresponding environmental pollution problems have attracted much attention. Marine pollution means the direct or indirect introduction of material and energy to the marine environment, causing damage to marine living resources, endangering human health and hindering marine activities. Reduce harmful effects such as seawater quality and comfort. At present, in addition to radioactive, thermal and solid pollution, marine pollution mainly includes oil pollution, pesticide pollution, heavy metal pollution, organic and nutrient pollution, microbial pollution. The metabolism of marine organisms to pollutants is an important mechanism to purify marine pollution, and also an important content of water environment capacity assessment. In marine biology, marine microorganisms have many unique biological characteristics, such as diversity, wide distribution, short production time, large specific surface area, strong specificity and strong adaptability [2]. Therefore, in the marine ecosystem, material circulation, energy flow and element transformation are very important, which are of great significance to the ecological balance. Environmental purification plays an important role. These are not effective indicators of environmental change, but important decomposition substances of harmful and harmful substances in the environment, which play an important role in the biological metabolism of pollutants in the marine environment. Subordinate trophic bacteria are the main types of marine microorganisms and play an important role in marine ecosystem. It has been reported that 60% of the world's green plants or 25% of the primary marine productivity are affected by

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planktonic bacteria. After use, the conversion efficiency of bacteria can reach more than 50%. In the coastal marine ecosystem, plankton only absorbs 20% of the primary production, and the remaining 40% is the heteromorphs of plankton and benthos. Engulfed by bacteria. The main ecological function of subordinate trophic bacteria is to decompose and utilize the organic matter in the environment[3]. The synthesis of bacterial cells is the process of transforming dissolved organic matter (DOM) into micro dust organic matter (POM). Its ecological importance lies in turning DOM, which is not used by animals, into food that small animals can eat. Sewage treatment projects use this conversion process to convert DOM that is not easily removed by physical or chemical methods into bacteria that can be collected by physical methods. Water (organic matter) can be purified by the respiration and synthesis of subordinate nutrient bacteria.

2. Application of Marine Microorganisms in the Control of Red Tide Organisms

Red tide is a global marine disaster and serious marine pollution, which is considered as a harmful algal flower. With the rapid growth of population and economy, the strengthening of human activities has changed the structure and function of coastal ecosystem, increased the content of nutrients in seawater, changed the climate and other environmental factors, and triggered red tide [4]. In the past 20 years, more than 300 harmful red tides have occurred in China. In 1998 alone, there were 22 red tide events. Moreover, the direct economic loss is more than 1 billion yuan. Toxic red tide often causes poisoning in human beings through shellfish, fish and other agents. Therefore, we believe that harmful red tide is a natural disaster caused by human activities that seriously restrict coastal economic development, destroy marine ecological environment and threaten human health. In the aquatic ecosystem, the relationship between microalgae and microorganisms is concerned, which makes great efforts for the biological control of red tide. In recent years, people gradually study the use of microorganisms to deal with harmful algae, such as algae microorganisms or biological domination of algae bacteria. Algorithmic microorganisms of solubility mainly include bacteria, fungi, viruses, actinomycetes, etc. Now, the research of algae bacteria is very popular. Zhao Yijun summarized the inhibitory effects of four kinds of bacteria on the proliferation and cytolysis of algae cells. Bacteria will release toxic substances to the environment and selectively kill algae cells. Algae cannot compete with bacteria because of their limited nutrients; phages are also algorithmic cells that can be transferred from bacteria to cells. In addition, non selective algal lysis of bacteria can help dissolve algal viruses to facilitate the algae dissolution process [5]. The effects of s 10 and P42 on the growth and toxicity of Alexandria eggs under the ecological conditions controlled by Su Jianqiang were investigated. S 10 strain with different concentrations can effectively inhibit the production of the mayesin in algal cells. P 42 can inhibit the proliferation of algal cells, and s 10 can also inhibit the production of algal toxins. It provides a theoretical basis for the biological control of red tide.

Table 1 Changes in the number of algal cells when Tris reagent is added

	0	2	4	6	8
Tris s7	25	251	325	413	500
Tris s7	63	213	338	113	1750
Tris s7	25	125	216	188	575
Tris Contrast	88	138	263	263	363

3. Application of Marine Microalgae in Biological Control

Marine microalgae are an important part of marine microorganisms, which can produce antibiotics and hinder the proliferation of bacteria [6]. At the beginning of the 20th century, Sanpu, etc. Photosensitive antibacterial compounds were isolated from Marine Chlorella. After that, it was found that all kinds of food microalgae had a certain biological control effect on the pathogenic bacteria of Vibrio in aquatic animals. For example, Chlorella can effectively inhibit the proliferation of Vibrio. The growth characteristics of Vibrio in microalgae feeding system were studied. Four

kinds of bribrio strains were selected from shrimp and scallop, and the growth characteristics of culture system of Chlorella 1061 were investigated. As a result, compared with the control group, the microalgae regeneration system showed a strong inhibition effect on the growth index of Vibrio in the later stable period (v.sp. Therefore, the microalgae supply system can remove Vibrio, which is of great significance for the prevention and control of marine aquatic animals [7]. The resistance mechanism of Vibrio in microalgae culture system was studied. The results showed that the proliferation of Vibrio was not limited by the coexistence of single strain and algae. When microalgae 3011 and 2038 were added to the community, the ability to repel Vibrio was restored. 4. The metabolites of feed microalgae (mixture of natural algae bacteria) do not limit the proliferation of Vibrio. The anti Vibrio mechanism of microalgae regeneration system can be summarized as follows. Microbial community based on microalgae.

Table 2 Changes in the number of algal cells when adding S5

	0	2	4	6	8
S5	88	251	500	750	1175
S5	75	125	313	500	750
S5	50	250	600	1775	2575
Contrast	13	113	200	713	1363

4. Rational Development and Utilization of Marine Microbial Resources

With the strengthening of the world population, resources and environmental problems and the reduction of land resources, the development of marine and marine resources, especially marine microbial resources, has attracted much attention. The diversity of marine microorganisms in marine pollution control, the role of marine chemicals, bioactive substances, marine limiting enzymes and marine microorganisms were studied [8]. Human beings have entered the deep sea, and some microorganisms can survive and reappear in extreme environments, such as extreme acidity, extreme alkalinity, extreme heat, extreme cold, high salt and high pressure. They may have several different metabolic pathways and genetic backgrounds. There are abundant deep-sea microbial resources, and 5% of them can be cultured in the laboratory, which greatly limits the development and utilization of deep-sea microbial resources. With the development of science and technology, the development and utilization of deep-sea microbial resources has gradually increased. Therefore, deep-sea microbial resources play an extremely important role in deep-sea pollution control. In recent years, the active substances of marine microorganisms have become the center of research, especially the microorganisms with medical and health functions. Other aspects, Zhang long, etc. Many algal bacteria have been shown to secrete extracellular materials in order to block or kill the bloom of harmful algae. The principle can be used in biological control of harmful algae bloom. Due to the diversity of classification and the specificity of genetic background, marine microorganisms have great potential to produce new bioactive substances [9]. The report shows that marine bacteria produce the most active species, while marine fungi and marine actinomycetes are highly likely to produce new bioactive substances. At present, the research is limited to the microbial groups which are easy to cultivate under the existing conditions. One of the future trends is to study the bioactive substances produced by non cultured marine microorganisms. China is rich in marine microbial resources. In order to remove the marine pollutants in China and find out the microbial species that are helpful for the biological control of marine pollution, it is necessary to strengthen the research in this area.

Table 3 Changes in the number of algal cells when 510 was added

	0	2	4	6	8
S10	63	313	1025	500	1385
S10	63	138	500	638	1225
S10	25	150	375	350	1225
Contrast	13	113	200	713	1050

5. Conclusion

Marine microbial resources are very rich and must be rationally developed and utilized [10]. As we advocate, we must properly deal with the relationship between marine microorganisms and human ecosystem. On this basis, the negative impact of marine microorganisms on human ecosystem will be minimized or eliminated, and their positive role will be brought into full play to achieve the ultimate purpose of using marine microorganisms for human beings.

References

[1] Han Shuwen, Da Miao, Qi Quan, Protective effect of the “food-microorganism-SCFAs” axis on colorectal cancer: from basic research to practical application. Journal of Cancer Research and Clinical Oncology, vol. 145, no. 2, 2019.

[2] Maisa M. Amin, Ibrahim E. Elaassy, Mohamed G. El-Feky, Recovery of uranium from low-grade ore using microorganism isolated from uraniferous rock sample. Separation Science & Technology, vol. 53, no. 14, pp. 1-6, 2018.

[3] N. Zhang, Q. Guo, C. Han, Application of Fuzzy Mathematics Method in Risk Assessment of Catering Microorganism Revised Draft. Journal of Chinese Institute of Food Science & Technology, vol. 17, no. 8, pp. 210-216, 2017.

[4] Takahisa Tajima, Kousuke Tomita, Hiroyuki Miyahara, Efficient conversion of mannitol derived from brown seaweed to fructose for fermentation with a thraustochytrid. Journal of Bioscience & Bioengineering, vol. 125, no. 2, 2017.

[5] Chen Ma, Yan Ni Liu, Lu Liang, Effects of combined application of chemical fertilizer and organic manure on wheat yield and leaching of residual nitrate-N in dryland soil. Ying yong sheng tai xue bao = The journal of applied ecology / Zhongguo sheng tai xue xue hui, Zhongguo ke xue yuan Shenyang ying yong sheng tai yan jiu suo zhu ban, vol. 29, no. 4, pp. 1240-1248, 2018.

[6] Luis P. Etude de la diversité génétique et fonctionnelle de champignons du sol présentant une activité laccasique :, mise au point d'outils moléculaires et application à l'étude comparative de sols agricoles et forestiers, 2018.

[7] Tan Y, Cui Y S, Xiu-Ling J I, et al. Research progress in microorganism changes of rhizospheric soil and root endogenous and ecology during continuous cropping of Panax notoginseng, vol. 48, no. 2, pp. 391-399, 2017.

[8] DAI Xiao-li, YAN Guang-xu, SONG Jia-yu, Research Progress on Bioremediation of Oil Spill Polluted Intertidal Zone with Microorganism Immobilization Technology. Environmental Engineering, 2017.

[9] TANG Guirong, ZHOU Xuan, TIAN Chang, Effects of Organic and Inorganic Nitrogen Fertilizer on Soil Microorganism and Enzyme Activity of Typical Vegetable Soil. Acta Agriculturae Boreali-Sinica, 2017.

[10] Laurence Lachaud, Anna Fernández-Arévalo, Anne Cécile Normand, Identification of Leishmania by MALDI-TOF mass spectrometry using a free web-based application and a dedicated mass spectral library. Journal of Clinical Microbiology, vol. 55, no. 10, pp. JCM.00845-17, 2017.