

# Analysis of the Marine Biomedical Industry Development in China

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## Abstract

In recent years, the country has attached more and more importance to the biopharmaceutical industry, and the marine biopharmaceutical industry has developed rapidly. At the same time, the overexploitation of marine resources has caused excessive damage to the marine ecology. This paper analyzes the current status of China's marine biopharmaceutical industry and its development trend, and provides feasible suggestions in order to promote the industrialization of the industry.

## Keywords

Marine biology; Pharmaceutical industry; Development analysis

## Introduction

With the development of the times, people pay more and more attention to their own health. my country is a country with rich natural resources and biological resources. The marine biopharmaceutical industry has broad market prospects. In recent years, some new products have been continuously launched. Among them, traditional medicines represented by "trichlorobenzene" and "sodium alginate" have begun to be favored by consumers and gradually eliminated, while medicines with high content of functional ingredients such as antibiotics have gradually entered everyone's field of vision and become a new type of health care products and green food. This makes the marine biopharmaceutical industry have huge development prospects in the pharmaceutical industry, and people's demand for it is still very large.

## 1. Overview of the development of marine biopharmaceutical industry

### 1.1 Basic meaning of the development of marine biopharmaceutical industry

The marine biopharmaceutical industry refers to the development of a variety of pharmaceutical products with certain health functions or therapeutic effects by deep processing marine organisms based on biotechnology and using modern high-tech. It includes many aspects such as chemical drugs, pharmaceutical preparations and Chinese medicine extraction. The most important of these is to achieve effective protection of human health and restore life activities through the combination of biochemistry and pharmacy, and then transform these substances into products that can directly or indirectly regulate changes in the body's physiological functions and play a role in the body.

### 1.2 The relationship between the marine biopharmaceutical industry and biodiversity

Marine life is rich in species and has a wide variety of types. Biodiversity refers to the number of forms and properties of a particular species. Different countries and regions have their own unique biological resources. Because the pharmaceutical industry has a lot of room for development, the diversity of marine biomedicine has also received great attention. On the one hand, it can be used to treat various diseases and prevent cancer and other diseases. On the other

hand, it can be used to prepare drugs or other uses, such as being used as chemical raw materials to make vaccines, which shows great prospects and value.

## **2. Development status of China's marine biopharmaceutical industry**

### **2.1 Development of China's marine biopharmaceutical industry**

China's pharmaceutical industry is in a period of rapid growth. With the rapid development of China's economy, people's demand for marine biopharmaceuticals and health products is also increasing, and there is a trend of year-on-year growth. However, there are still many problems in the development of China's pharmaceutical industry. On the one hand, the domestic market is huge and complex, and some developed countries in the world, such as Japan, use various means to restrict exports to meet the needs of domestic consumers in order to protect their own interests. On the other hand, due to the late start of biomedicine in China, people have little knowledge of biomedical technology and lack of research and development and processing technology of marine biological drugs [1].

### **2.2 Obstacles to the development of my country's marine biopharmaceutical industry**

China's marine biopharmaceutical industry started late, has a short development time, and is not well-known and recognized internationally. Due to the large domestic market demand, high consumption capacity and improved living standards, people need to continuously develop and utilize marine resources. At present, China's research on marine biopharmaceuticals is still in its infancy, which is mainly reflected in two aspects: on the one hand, China attaches little importance to the development of new drugs, and lacks certain experience in advanced technology and process level, and the relevant scientific research institutions are not sound, which makes it impossible for some domestic companies to effectively promote and apply them. On the other hand, due to insufficient funds, equipment and personnel, there is a large gap between R&D investment and production and manufacturing, and there is no corresponding supporting system in product development.

### **2.3 Current status of marine biopharmaceutical industry policy**

In the process of development of my country's marine biopharmaceutical industry, the government attaches great importance to it and has given great support in terms of policies, but many problems have also emerged. On the one hand, there is no complete and sound marine drug research and development and management system. Although the country has formulated relevant laws and regulations to regulate corporate behavior and protect consumer rights, on the other hand, due to the lack of unified standards, there are multiple leaders or unclear responsibilities among departments. Among them, there are inconsistent policies on the development and utilization of marine biological resources among various regions, resulting in competition for biological resources.

## **3. Advantages of the development of marine biopharmaceutical industry**

### **3.1 Technical advantages**

China's marine biological resources are rich, widely distributed and diverse, among which the seabed organisms, the Ezowu Reef and the Himalayan River are the representatives, and some marine species such as the East China Sea No. 1 Sea also have a certain scale. Technical advantages: First, it is reflected in the strong ability of technological innovation. There are many large deep-sea operating platforms and various equipment, instruments, production processes and manufacturing methods in China's waters. Secondly, it is reflected in the high quality of products. The content of active substances in marine organisms is extremely high and rich, including proteins, amino acids, vitamins and other important elements. These ingredients play a vital role in human health.

### **3.2 Talent advantage**

China is a country with a large population in the world. There are a certain number of talents in the pharmaceutical industry. Among these people, there are many researchers with strong medical knowledge and scientific research capabilities, rich medical experience, and mastery of international advanced technology levels, as well as rich experience and resource advantages. With the continuous progress and innovation of science and technology, medical equipment and drug research and development personnel need a large number of compound application talents who are proficient in medicine and understand technology development work. At the same time, they must also master modern advanced scientific knowledge to cope with the challenges brought about by various complex environmental

changes in the new era. At present, China has a large number of high-quality medical graduates and reserve experts and scholars with strong medical engineering technology research capabilities and a certain level of scientific research to meet the needs of the industry [2].

### **3.3 Environmental advantages**

China is a country with rich marine resources, especially offshore areas. China's sea area ranks second in the world. Jiayuguan and coastal islands account for more than 95% of the country's total area. These waters have unique geographical advantages. Marine organisms contain many organic substances, such as proteins, amino acids and other active ingredients, rich in mineral elements such as calcium bodies, phosphates and selenium compounds, etc. They have their own unique biological value, economic benefits and other health effects in social significance. They have important uses in medical treatment and are also a good source of auxiliary therapeutic drugs and medicines.

## **4. Disadvantages of the development of the marine biopharmaceutical industry**

### **4.1 Industrial development lacks scale, and the dominant position of enterprises in innovation has not yet been established**

The development of China's pharmaceutical industry has always been dominated by small and medium-sized enterprises. Biological preparation companies are small in scale and lack leading enterprises and financial support, which leads to the lack of fierce competition within the entire industry. Although the country has increased its investment in marine drug research and development in recent years and issued relevant policies to encourage domestic pharmaceutical institutions to develop new marine biological products, develop new compound anti-gels and apply for patents, etc., using this series of measures to accelerate the development of China's pharmaceutical industry, most of these biological preparation companies do not have their own core technologies or have weak independent innovation capabilities.

### **4.2 The industrial development mechanism needs to be improved, and the investment and financing system supporting innovation has not yet been formed**

At present, China's marine biopharmaceutical industry development mechanism does not have a complete and systematic policy system and laws and regulations to support it. First of all, in terms of market access, due to the lack of effective regulatory measures and corresponding system defects, many companies are unable to enter or exit. Secondly, the government's insufficient investment in new product research and development funds is an important factor affecting the development of the entire industry and the improvement of innovation capabilities. Finally, compared with some foreign biopharmaceutical manufacturers, they have advanced, complete and strictly standardized management systems and financial systems, which enable them to better attract the attention of foreign capital and investors, thus hindering the development of China's industry.

### **4.3 The advantages of marine science and technology have not been fully utilized, and the service system supporting innovation is relatively backward**

At present, China's pharmaceutical industry is in the process of transforming from a traditional to an innovative one. This transformation requires continuous progress in technology and management, but overall, there is still a big gap compared with developed countries. There are obvious deficiencies in the three aspects of innovation capability, research and development of new products, and marketing models. First, most Chinese companies lack awareness of independent intellectual property protection; second, the industry lacks relevant laws and regulations on patents; and finally, a complete pharmaceutical industry science and technology system has not been established, resulting in a series of problems such as slow and unstable development of the entire industry [3].

## **5. Countermeasures and suggestions for improving the development of my country's marine biopharmaceutical industry**

### **5.1 Establish special funds for industrialization and build a diversified funding system**

According to convention, a country's special funds for industrialization should be funded by at least two different industries and departments, in accordance with the principle of "whoever invests, whoever benefits". First of all, establishing a diversified source of funds is what China's pharmaceutical companies must do in the process of

development, and it is also the way to improve product quality and market competitiveness; secondly, we can also learn from foreign advanced experience to make up for our own shortcomings, so as to continuously improve our country's special funds system for industrialization, so as to adapt to economic globalization and competition liberalization under the market economy system. Finally, China should make full use of the advantages of government policies.

## **5.2 Strengthen the construction of marine biomedicine innovation platform and build an industrial development system**

Strengthen the construction of innovation platforms to provide a good foundation for the development of the marine biopharmaceutical industry. First, we need to establish and improve marine biopharmaceutical research institutions and improve and integrate existing research. Secondly, we need to increase the cooperation and exchange between Chinese enterprises and foreign advanced technologies, work hard to improve innovation capabilities and R&D levels, and accelerate the development of biological drug products in China. Finally, we need to encourage the introduction of leading foreign talents under certain conditions and cultivate outstanding domestic technical and management talents. This will provide a good platform for promoting the healthy, stable and sustainable development of the marine biopharmaceutical industry [4].

## **5.3 Increase support for small and medium-sized marine biopharmaceutical companies and improve their independent innovation capabilities**

my country's pharmaceutical industry is a sunrise industry. With the support of national policies, the development of domestic enterprises is promoted by introducing advanced technologies and independent innovation capabilities. However, since most of my country's small and medium-sized biopharmaceutical companies are small in scale and weak in strength, the government needs to increase its support for small and medium-sized enterprises in the industry and provide appropriate subsidies to attract more outstanding talents to join this large market. At the same time, government funds can also be used to establish some funds that are conducive to the healthy and orderly development of the pharmaceutical industry.

## **5.4 Strengthen talent training and introduction to form a sustainable marine biomedicine innovation team**

The development of medicine in my country has always been faced with problems such as talent shortage, lack of innovation ability, and serious vicious competition among enterprises. In such an environment, we need a group of talents with creativity and pioneering spirit, who are good at learning and studying marine science knowledge and can adapt to the requirements of the times to develop the industry. Marine biomedicine research and development is a complex and arduous task, and we need to continue to carry out exploratory work to successfully complete its value. Therefore, we must increase the training of talents in marine medicine in my country and establish a sound talent introduction mechanism, which has far-reaching significance for promoting the improvement of personnel quality in my country and cooperation between enterprises.

## **5.5 Establish and improve policies and regulations for the development of the biopharmaceutical industry**

China should formulate relevant policies and regulations to support and encourage enterprises to develop the pharmaceutical industry so that it can proceed in a healthy and orderly manner. On the one hand, the country should establish a sound legal and regulatory system to provide strong protection for the biopharmaceutical industry, and at the same time regulate the behavior of market entities and problems in the transaction process and propose corresponding solutions. On the other hand, it is necessary to set up special departments to supervise and inspect the production, transportation and sales of drugs. For some criteria related to life and health, strict standards and regulations should be formulated to restrict enterprises from using unqualified or unreasonable products.

## **5.6 Vigorously promote the cultural construction of the development of the biopharmaceutical industry**

The pharmaceutical industry is a major part of cultural construction and an indispensable part of the development and improvement of China's medical security system. Therefore, in order to make China's biopharmaceutical industry move forward rapidly and steadily, it is necessary to vigorously promote its humanistic spirit, national traditions, regional characteristics, etc., and increase investment to promote the biopharmaceutical industrialization process of

the entire country and even the world to a higher and farther direction. On the one hand, it is necessary to strengthen the emphasis on cultural construction, combine the traditional Chinese medicine industry with the modern Chinese medicine industry, drive the development of medicine, and make it a Chinese cultural heritage industry with national characteristics and regional characteristics; on the other hand, it is necessary to increase publicity efforts to improve people's understanding of the development, utilization and promotion of China's biological resources, strengthen the understanding and recognition of Chinese traditional culture through television media, the Internet and other channels, face up to the current development status and future trends of the Chinese medicine industry, and make it an industry that people yearn for and develop [5].

### 5.7 Strengthening industrial development

To strengthen industrial development and enhance the competitiveness of my country's marine biopharmaceutical industry in the international market, we must continue to research and innovate, and increase R&D investment in new varieties, new technologies and bioactive ingredients. First, we should accelerate the structural adjustment of the domestic pharmaceutical industry by introducing advanced foreign production processes and equipment and excellent domestic and foreign talents. At the same time, when learning from foreign advanced experience, we must also learn to combine my country's national conditions and formulate strategic plans that meet the needs of the development of socialism with Chinese characteristics. Secondly, we should develop new drug preparation processes with Chinese medicine as the theme in traditional Chinese medicine, actively promote the concept of "green and natural" to be deeply rooted in the hearts of the people and coordinate with my country's medical and health care, develop products with Chinese characteristics, and improve the added value and international competitiveness of the marine biopharmaceutical industry.

## 6. Conclusion

Although my country's marine biopharmaceutical industry has made great progress in recent years, there is still a certain gap compared with developed countries such as Europe and the United States. With the serious aging of the world's population and the improvement of people's health awareness, the demand for the biopharmaceutical industry has increased. Therefore, we must pay more attention to the research and development of new products and strengthen technological innovation to meet consumer demand, increase capital investment, expand scale production and operation, and establish a complete and systematic and effective legal and regulatory system to provide a good environment for the development of my country's marine biopharmaceutical industry, so as to better promote the sustained, stable, rapid and sustainable development of my country's marine biopharmaceutical industry.

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