



Analysis of Traditional Chinese Medicine Products Under the Perspective of Comparative Advantage Index

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Abstract. Objective: To explore the international development path of traditional Chinese medicine products. Methods: Descriptive statistics were used to analyze the import and export of traditional Chinese medicine products, and comparative advantage index was used to study the trade competitiveness of traditional Chinese medicine products in the international market. Results: First of all, the international trade of traditional Chinese medicine products had certain advantages, but it showed a decreasing trend year by year. Secondly, the value range of comparative advantage index of Traditional Chinese Medicine Products was $[-1, 1]$. The closer the value was to -1 , the weaker the trade competitiveness was; the closer its value is to 0, the closer its competitiveness is to the international average level; the closer its value is to 1, the stronger its trade competitiveness is. Conclusion: We should give full play to the important role of traditional Chinese medicine in the process of curing diseases and keep people's health, and take effective efforts to develop the trade of Traditional Chinese Medicine services with the establishment of overseas service alliance.

Keywords: Traditional Chinese Medicine · International Trade · Comparative Advantage Index

1 Introduction

Novel coronavirus was widely found around the world since the year of 2019 (COVID-19). National and Regional Health Commissions and Administration of TCM have successively proposed treatment plans for Novel coronavirus (COVID-19), including many TCM prevention plans. On March 23, 2020, Yu Yanhong, Secretary of the Party Leadership Group of the State Administration of TCM, announced a set of data on the anti-epidemic: Among the confirmed cases of COVID-19 in China, more than 90% of the patients were treated with traditional Chinese medicine. At that time, TCM became the necessary medicine to fight “epidemic”.

Since the outbreak of COVID-19, TCM has fully participated in the prevention and treatment of the epidemic and made important contributions. However, it should also be noted that TCM still has problems such as insufficient supply of high quality, great impact of trade barriers and development characteristics to a certain extent. There are

many researches on the clinical application of Chinese herbal medicine in academic circles, but few researches on the trade of traditional Chinese medicine products in the post-epidemic period. It needs correctly evaluate the trade potential of TCM products, analyzes the main reasons for affecting trade, and makes relevant trade preparation and countermeasures in order to have the TCM products obtain the core competitiveness in the international market.

2 Research Methods

2.1 Literature Method

After sorting out the literature on trade of TCM products and trade barriers, it is found that there are few studies on the export trade of TCM products in China. Therefore, this paper starts its analysis from this point.

2.2 Descriptive Statistical Method

The import and export data of TCM products from 2014 to 2019, and the value added of traditional Chinese medicine products were judged. The comparative advantage index (TC index) was used to analyze the competitiveness of traditional Chinese medicine products in international trade, so as to obtain the export competitive advantage of TCM.

3 Current Situation of Import and Export of TCM Products in China

According to the statistical classification of customs, the Chinese medicine products imported and exported by China are divided into four categories: Chinese patent medicine, extract, Chinese herbal medicine and herbs, health care products. As it can be seen from Fig. 1, China's international trade of TCM products is mainly dominated by export. From 2014 to 2015, China's export volume of TCM products increased steadily. In 2016, the export volume of TCM products decreased to US \$3.426 billion, down by US \$344 million or 9.13% compared with 2015. From 2015 to 2019, China's import volume has maintained growth, and the import volume in 2019 has increased by 110.24% compared with that in 2014 [4].

In 2019, China's TCM products were exported to 193 countries and regions. Asia is still the main market of TCM exports area. China's TCM exports to Asian countries and regions reached 2.388 billion US dollars, an increase of 8.02% year on year, accounting for 59.42% of China's TCM exports.

3.1 Import and Export Structure

Table 1 shows the import and export volume of traditional Chinese medicine products from 2014 to 2019. As it can be seen from Table 1, the export volume of extracts in China accounts for the largest proportion in the total export volume of TCM products.

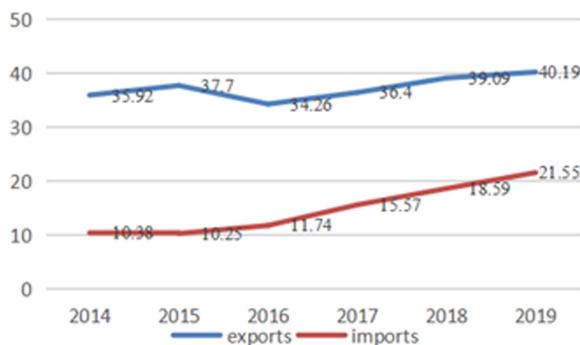


Fig. 1. Import and export volume of traditional Chinese medicine products from 2014 to 2019 (Unit: \$100 million)

Table 1. Import and export volume of various traditional Chinese medicine products from 2014 to 2019 (Unit: \$100 million)

Time	Extract		Chinese herbal medicine and herbs		Chinese patent medicine		Health care products	
	exports	imports	exports	imports	exports	imports	exports	imports
2014	17.77	3.06	12.95	2.26	2.5	2.64	2.7	1.6
2015	21.63	4.09	10.58	1.66	2.62	2.91	2.82	1.6
2016	19.27	5.22	10.25	1.39	2.25	3.21	2.49	1.92
2017	20.1	6.06	10.02	2.61	2.5	3.68	3.60	3.23
2018	23.68	7.26	10.31	2.85	2.64	4.02	2.47	4.45
2019	23.72	8.49	11.37	3.58	2.47	5.56	2.55	3.92

The second largest Chinese medicinal products exported by China are Chinese medicinal materials and decoction pieces. The proportion of Chinese patent medicine and health care products in the import and export of traditional Chinese medicine products is relatively low. This indicates that the Chinese medicinal materials, decoction pieces and extracts have the potential in the international trade of Chinese medicinal products. This is also a reflection of the high trade competitiveness index of Chinese medicinal materials, decoction pieces and extracts mentioned later in this paper, and the existence of trade competitive advantages, which also indicates that the export commodity structure of Chinese herbal medicine is still dominated by Chinese herbal medicine and plant extracts with relatively low added value, but China's export of Chinese medicine products cannot only rely on these two products for a long time. In order to develop traditional Chinese medicine industry, we should also adjust the commodity structure of TCM export. This requires TCM enterprises to increase their investment in scientific research and establish better research institutions, promote innovation and turn research and development results into competitive products as soon as possible.

Table 2. Trade Competitiveness Index of TCM Products from 2014 to 2019

Time	Extract	Chinese herbal medicine and herbs	Chinese patent medicine	Health care products
2014	0.71	0.70	-0.15	0.23
2015	0.68	0.73	-0.05	0.28
2016	0.57	0.76	-0.16	0.13
2017	0.54	0.59	-0.79	0.05
2018	0.53	0.57	-0.24	-0.28
2019	0.47	0.52	-0.38	0.21

3.2 Import and Export Trade Competitiveness Index

Comparative advantage index refers to the proportion of a country's import and export trade balance in its total import and export trade. It is a powerful tool to analyze international competitiveness, Comparative Advantage Index = $(\text{Exports} - \text{Imports}) / (\text{Exports} + \text{Imports})$, The value range of the comparative advantage index is $[-1, 1]$, and the closer the value is to -1 , the weaker the trade competitiveness is the closer its value is to 0 , the closer its competitiveness is to the international average level. The closer its value is to 1 , the stronger its trade competitiveness is.

Table 2 shows the calculated trade competitiveness index of four categories of traditional Chinese medicine products in the six years from 2014 to 2019. On the whole, the trade competitiveness index of TCM products is about 0.5, indicating that China is an exporter of TCM products with strong international trade competitiveness. The trade competitiveness index of the extract was about 0.6, but the trade competitiveness index showed a gradually declining trend, indicating that the extract had a good international competitiveness in international trade, but this competitiveness showed a declining trend. Compared with the extract, the trade competitiveness of Chinese medicinal herbs and decoction pieces was slightly higher, but it also showed a downward trend. The trade competitiveness index of Chinese patent medicine and health care products is hovering in the range of $[0, -1]$, and its trade competitiveness is roughly close to the international average level. Among them, the trade competitiveness index of proprietary Chinese medicine is less than 0 from 2014 to 2019, indicating that China is a net importer of proprietary Chinese medicine. Combined with the comparative advantage index of the four kinds of TCM products, it can be seen that the competitive advantage of China's TCM products in trade is gradually decreasing.

3.3 Countries and Regions of Import and Export

In recent years, the TCM market in Europe and the United States continues to expand, but the proportion of TCM products imported from China by other countries in the whole European and American markets is still very low, except that the United States remains the largest export market of traditional Chinese medicine products. China's import market of TCM products is dominated by neighbouring countries, and from the

perspective of amount, it is concentrated in North America and Central Asia. From the perspective of region, the main import region is Central and South Asia, while European countries have a small import share [2].

4 New Opportunities for Export of Traditional Chinese Medicine Products

According to Chinese customs statistics, in the first half of 2020, China's export of TCM products increased by 6.18% year on year to reach \$2.144 billion, and the export of TCM and decoction pieces increased by nearly 20% year on year to reach \$618 million. Exports of some Chinese medicinal materials related to the fight against COVID-19 increased to varying degrees. In the first half of 2020, exports of ephedra, Astragalus membranaceus, Angelica sinensis, Scutellaria baicalensis, Licorice Radix, Chuanqiao, Rhubarb, Pinellia tuber, Poria cocos, Artemisia annua, Fritillaria and other varieties increased by 5%–51% year on year (Fig. 2).

4.1 Support from National Policies

The State Council general office issued by the deepening medical and health system reform in 2020 in the second half of the key tasks “mentioned in the notice, and promote the development of the revitalization of TCM, in a general hospital, hospital of infectious diseases, such as specialized subject hospital promoting traditional Chinese and western medicine combined with the medical model, the unique role to play in the major outbreaks of TCM treatment and support inheritance innovation and development of TCM. One year later, the “Several Policies and Measures for Accelerating the Characteristic Development of TCM” was issued. National policy support measures not only provide a favourable development environment for the development of TCM in China, but also effectively promote the internationalization of TCM [1].

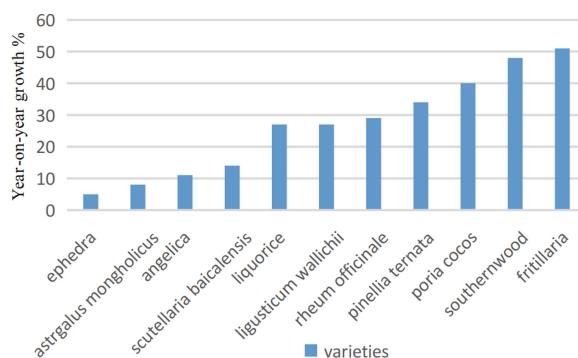


Fig. 2. The year-on-year increase of the export volume of related Chinese medicinal materials of COVID-19 from January to June in 2020

4.2 High Requirements for the Quality of Chinese Medicinal Materials

2020 edition of the “pharmacopoeia of the People’s Republic of China was taken into practiced on December 2020. In the implementation, for all varieties of TCM was added as disabled 33 kinds of pesticide residue control, strengthen the heavy metals of TCM. The control of harmful substances such as aflatoxin, part of the control target requirements and standards such as the European Union and the United States was even more strict under the new regulatory requirements. The country domestic export of Chinese medicinal materials quality would be synchronized to ascend. Export herbs such as pesticide residue problems may have a degree of ease.

4.3 Enhance the Vitality of the Development of the TCM Industry

In recent years, China is gradually reforming and improving the review and approval mechanism of TCM, adding new impetus to the high-quality development of TCM industry. In order to solve a large bay area of Guangdong traditional Chinese medicine industry, the enterprises face in the process of development policy technical difficulties and bottlenecks, setting up the “Guangdong, Hongkong & Macau policy and technology research center of traditional Chinese medicine” to strengthen the policy and technology research of traditional Chinese medicine, and promote the standardization and internationalization of traditional Chinese medicine. The construction of industrial park has set many wisdom. With a large bay area of Guangdong traditional Chinese medicine, the development policies gradually mature and fall to the ground. Multiple value and advantage of traditional Chinese medicine would be integrated into the construction of a large bay area of Guangdong. Innovation elements of traditional Chinese medicine would speed up the gathering the industry abilities, and driving the development of overall business and industry with high quality of Traditional Chinese Medicine.

4.4 Spread the Culture of the TCM

During the prevention and control of COVID-19, Chinese and foreign TCM experts discussed the effectiveness of TCM in fighting the epidemic through video conference in the special program of “Global Epidemic Meeting Room”, and raised questions and answered them, which not only promoted the international exchange and exchange of TCM theories, but also jointly promoted the globalization and internationalization of TCM, by discussing the feasible scheme of TCM modernization technology.

5 Challenges of China’s Export of TCM Products

There are several characteristics of TCM in the overseas anti-epidemic. First, the consumer group of TCM is still mainly Chinese, and the white mainstream group uses TCM less. Second, the sales of TCMs are still mainly Chinese medicinal materials and decoction pieces, and Chinese patent medicines cannot legally enter the foreign market without registration. Third, TCM is mainly used to prevent COVID-19, improve immunity and improve respiratory symptoms, and is rarely used for direct treatment of COVID-19.

5.1 Weak Intellectual Property Rights of TCM Products

Although there are relevant laws and regulations in China, the intellectual property protection mechanism is not perfect, and legal loopholes and deficiencies of intellectual property still exist, which increases the difficulties for TCM enterprises applying for registration in China. In the meantime, it is expensive to apply for effective protection of intellectual property in the international market, and the TCM industry that fails to apply cannot obtain effective protection of intellectual property in the international market. For example, China's "Naoxue Kang", "Guanxin 2" and other products have not applied for patent, but become the Japanese patent products; Only with the approval of the Republic of Korea can China produce improved TCM products such as Niuhuang Qingxin Pills microcapsules and oral liquid [3].

5.2 The Market Competition of Botanical Drugs is Fierce

The competition in the global pharmaceutical industry is becoming increasingly fierce. Large pharmaceutical companies in western countries have abundant funds, talented people, and strong R&D and production capacity. In the international Chinese patent medicine market, Japan and South Korea are China's main competitors. The global sales of Chinese patent medicine is more than \$30 billion, but the share of Japan and South Korea is as high as 80% to 90%, while China only accounts for about 5%. Japan and South Korea import a large number of low-cost plant pharmaceutical raw materials and extracts from China, and then process them into Chinese herbal products with high added value by virtue of their technological advantages, and their products sell well in the international market. Therefore, even though China is a big exporter of TCM raw materials, due to the lack of advanced production mode and technology of TCM industry, the modernization level of TCM enterprises still lags far behind that of developed countries and does not occupy a competitive advantage in the field of international natural botanical medicine.

6 Conclusions and Recommendations

6.1 Proactively Publicize the Role of TCM in the Global Fight Against the Epidemic

TCM researchers need to systematically collate the clinical data of TCM treatment of COVID-19 in China. It speaks with scientific facts, and publishes significant articles in mainstream scientific journals, so as to promote the global understanding of TCM clinical evidence in combating the epidemic.

6.2 Develop Trade in Services and Realize Global Resource Allocation

In the Services Trade Fair 2020, TCM had been a highlight of the conference due to its great achievements in trade services and its important role in the fight against COVID-19 [5]. In terms of the international publicity of TCM, the government should encourage various forms of international academic exchanges on TCM, to eliminate foreign misunderstandings on TCM to a certain extent, and gradually gain the recognition from many countries around the world.

6.3 Establish an Overseas Service Alliance for Traditional Medicine

The policies and regulations of TCM in overseas countries are different, even among the member states of the European Union. It is necessary to systematically study the laws and regulations of each country, collect specific information of each market. Form the national laws and regulations in different regions, TCM can take a more steady step in going global. To expand the scale of overseas TCM products under the premise of controlling quality risks, only by forming large-scale overseas TCM products and large-scale service means could we build overseas sales channels, which were truly suitable for the characteristics of TCM to make up for the shortcomings in the overseas development of TCM, and truly achieve the realization of the importance of Traditional Chinese medicine products.

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