

# Research on the Dissemination and Knowledge Reproduction of *Jiuhuang Bencao* in Edo Japan

Mengqi Mei<sup>1</sup>

<sup>1</sup> College of Liberal Arts, Nanjing University of Information Science and Technology, Nanjing 210044, China

Correspondence: Mengqi Mei, College of Liberal Arts, Nanjing University of Information Science and Technology, Nanjing 210044, China.

doi:10.56397/SSSH.2025.01.05

## Abstract

Compiled by Zhu Su, Prince Ding of the Ming Dynasty, *Jiuhuang Bencao* is the first agricultural and monograph on botany in Chinese history with the aim of relieving famine. After the book was introduced to Japan, it was highly valued by Japanese herbalists for its scientific and practical value. Some famous people began to publish and explain the book, and combined Chinese famine relief theories with Japan's local conditions to compile a series of local famine relief works. Promoted by Japanese herbalists, *Jiuhuang Bencao* has been widely disseminated, opening up a broad field of Chinese and Japanese herbal research.

**Keywords:** *Jiuhuang Bencao*, scientific value, dissemination in Japan, knowledge reproduction

## 1. Introduction

In the late Yuan Dynasty and early Ming Dynasty, natural disasters were severe and wars were frequent. There were widespread displaced people and a severe shortage of food. Zhu Su was the fifth son of Zhu Yuanzhang. He was exiled to Yunnan and other places several times and deeply understood the difficulty of the people's lives. Influenced by Zhu Yuanzhang, Zhu Su devoted himself to the study of medicine, planting plants and observing and recording them. He compiled *Jiuhuang Bencao*, which opened up a new field of plant science called "Edible Materia Medica". The book was first printed in 1406, and is divided into two volumes. A total of 414 species of wild plants used to *Jiuhuang Bencao* are recorded, of which 138 are from previous works of materia medica and 276 are new.

At the end of the 17th century, *Jiuhuang Bencao* was transmitted to Japan. At that time, Japan was frequently hit by famines and the people were living in hardship. The wild plants introduced in the book were beneficial to alleviating food shortages, which was in line with the national conditions of Japan, and attracted the attention of Japanese herbalists. Some famous herbalists such as Matsuooka Joan and Ono Ranzan began to annotate and teach *Jiuhuang Bencao*. Under their influence, Japanese herbalists began to compile a series of works on famine relief in their own country, which expanded a new field of research in Japanese materia medica.

By searching for ancient books, exploring the publication and dissemination of *Jiuhuang Bencao* in Japan, studying the reproduction of knowledge about famine-relief plants by Japanese herbalists, and writing about the process of domestic famine relief and herbal works, it is important to explore the historical exchanges between the two countries in agronomy, pharmacology, etc., and further explore the modern practical value of *Jiuhuang Bencao*.

## 2. Overview of *Jiuhuang Bencao*

### 2.1 Author Introduction

The author of *Jiuhuang Bencao*, Zhu Su (1361–1425), was the fifth son of Zhu Yuanzhang. In 1378, Zhu Su was

made the Prince of Zhou by the first emperor, and his fief was set in Kaifeng. In 1389, Zhu Su was demoted to Yunnan for leaving his fief without permission. During this period, Zhu Su gained a thorough understanding of the suffering of the common people. After returning to Kaifeng, Zhu Su used his political and economic position to organize a group of scholars and painters with expertise in their fields in Kaifeng. They collected a large amount of books and materials and planted wild edible plants for observation and experimentation. In 1406, the book *Jiuhuang Bencao* was first published. The content of the book focuses closely on “the livelihood of the people” and opens up a new field of plant science called “Edible Materia Medica”, providing valuable information for the study of botany in later generations.

## 2.2 Background to the Composition of a Book

Zhu Su had been to Yunnan, Kaifeng, Nanjing and other places due to being conferred a title or exiled, and had experienced many natural disasters, which made him more deeply understand the suffering of the people and devote himself to the study of medicine. In order to learn from history and avoid food shortages caused by famine years that triggered popular rebellions, and to help the people identify and use various wild plants to replace food to stave off hunger and survive, Zhu Su compiled the book *Jiuhuang Bencao*. The background to the book can be explored from the following three perspectives: nature, society and reality.

First, in Chinese history, natural disasters caused by natural and man-made disasters were particularly severe in the Ming Dynasty. Deng Tuo's History of Famine Relief in China records: “The Ming Dynasty lasted 276 years, and there were an unprecedented 1,011 disasters. At that time, the most frequent disaster was flooding, which occurred 196 times (Deng Tuo, 2012).” In addition, Kaifeng is located in the Central Plains and in the middle and lower reaches of the Yellow River. It has a flat terrain with a small gradient that easily collects water, and is one of the high-risk disaster areas in Chinese history. Just in the 25 years between Zhu Su in Kaifeng (1381) and the publication of *Jiuhuang Bencao* (1406), there were at least seven major famines. Natural disasters seriously affected people's lives and social stability.

Second, the frequent wars at the end of the Yuan Dynasty and the beginning of the Ming Dynasty were intertwined with man-made famines. At the end of the Yuan Dynasty, the ruling class's plunder and enslavement of all ethnic groups, especially the Han people, was extremely cruel, leading to acute social contradictions. The government's arbitrary levies and numerous harsh taxes and fees increased the burden on the people's lives. The Yellow River was out of repair for many years and broke its banks many times, causing great disasters for the people. Social productivity was severely damaged, and the ability of farmers to withstand natural disasters was extremely low. Even though economic development recovered somewhat in the early Ming Dynasty, the phenomenon of displaced people remained serious due to the frequent disasters, and food shortages still existed.

In addition, traditional Chinese thinking on famine relief was rich, and there were many works on disaster relief and famine relief. From the Western Han Dynasty's *The Book of Fan shengzhi* to the Yuan Dynasty's *Book on Agriculture*, the content of agricultural literature on disaster relief herbs has evolved from simple to rich, and there was development in terms of the number of herbs recorded and the form of the content. However, the focus was limited to whether such plants were edible and how to grow them. Against this background, Zhu Su was influenced by his emperor father and devoted himself to the study of medicine. At the same time, with his special status as a feudal prince, he organized human and material resources to investigate, collect, plant, and verify the efficacy and toxicity of plants, and recorded the research results in writing and illustrations, and finally compiled them into a book. It is precisely based on the above reasons that led to the birth of the book *Jiuhuang Bencao*.

## 2.3 Value of the Book

*Jiuhuang Bencao* is the earliest existing monograph on plants in China with the aim of relieving famine. The book is arranged according to the practical uses of the plants. The entire book is divided into two volumes, with 414 species of plants recorded, each accompanied by a beautiful woodcut illustration. It is specifically divided into five parts: grass (245 species), wood (80 species), rice and grain (20 species), fruit (23 species), and vegetables (46 species). Each part is further subdivided according to the edible parts into categories such as “leaves are edible”, “fruits are edible”, and “both leaves and fruits are edible”. According to whether they were recorded in previous herbal medicine books, each type of plant in *Jiuhuang Bencao* is divided into two parts: “original” and “new”. There are 138 types of “original” plants, which “belong to the category of Chinese herbal medicines used to treat diseases, but after being selected by the editor, their new edible value has been rediscovered, making them new foods to prepare for famine and hunger. Their value cannot be underestimated” (Yan Xianzhang, 1993). There are a total of 276 new plants in the “new” section.

Zhu Su recorded each plant in three parts: plant overview, famine relief, and disease treatment. The plant overview includes a detailed description of the plant's name, origin, characteristics, nature, etc., so that the common people can identify and collect it; the famine relief section mainly describes the edible parts of the plant and the specific methods of consumption to prevent food poisoning; the disease treatment section briefly

describes the medicinal value of the plant and the conditions it treats. The book introduces plants by name and then by place of origin. *Jiuhuang Bencao* includes the geographical distribution of wild plants, centered around the fief of Kaifeng, the observation range roughly extending from the Taihang Mountains in the north, to the Tongbai Mountains in the south, to the Funiu Mountains in the west, and to Shangqiu in the east (Wang Xingguang & Peng Yong, 1996). In addition, Zhu Su and others were concerned that the ecological environment and geographical location had a great impact on the growth of the same species. For example, when describing the pears that we are still familiar with today: “Eli come from Zhengzhou, which are extremely tasty and fragrant with a lot of pulp; Ruli come from Xuancheng, which have thick skin and firm flesh and a very long taste; Shuili come from the northern capital, which have thin skin and a lot of pulp and a poor, short taste.” It is emphasized that pears from different places may affect the quality and characteristics of their fruits due to differences in geographical environment.

### 3. The Publication and Dissemination of *Jiuhuang Bencao* in Japan

*Jiuhuang Bencao* has attracted the attention of different academic circles due to its multiple natures, including materia medica, agronomy, and famine relief, as well as its detailed plant descriptions and practical value. Since the Ming Dynasty, it has been reprinted in many versions. Among them, the inclusion of Xu Guangqi’s Complete Treatise on Agriculture (1639) provided an important way for the dissemination of *Jiuhuang Bencao*. At the end of the 17th century, the standalone version of *Jiuhuang Bencao* and the version included in the Complete Treatise on Agriculture were introduced to Japan, where they were highly valued in the fields of medicine and agriculture. Not only did the famous Edo scholars begin to publish and annotate the book, they also focused on combining theory with practice, which gave rise to Japan’s own famine relief works.

#### 3.1 Dissemination Context

Although the Edo period (1603-1867) was a golden age for the development of agriculture and agronomy, the Tokugawa bakufu system made the burden of the peasants ever heavier. In addition to the heavy “annual tribute” and taxes, frequent disasters made the farmers’ lives even more difficult. According to statistics, there were three large-scale famines in the Edo period, namely, the Kenpo famine (1731-1732), the Tenmei famine (1783-1787), and the Tenpo famine (1833-1847). In addition, there were severe disasters such as freezes and floods, which made the grain production in some places almost zero in the following year. The lack of food and the high price of rice caused many peasants to die of sickness, hunger, and epidemics.

At the same time, thanks to the in-depth exchanges between China and Japan in the field of agricultural science and technology during the same period, a large number of agricultural books were imported into Japan. *Jiuhuang Bencao* in such a background eastward to Japan, because of its content of practical, appropriate record and drawing exquisite, in line with the needs of the Japanese national conditions, quickly won the Japanese scholars Matsuoka Joan, Ono Ranzan and other people attach great importance to and attention. They annotated and explained *Jiuhuang Bencao*, and at the same time taught *Jiuhuang Bencao* as a textbook in Japan, making great contributions to its dissemination.

#### 3.2 Dissemination Version

Before the Meiji Restoration (1868), there were three printed editions that had been edited and published by herbalists that had a profound impact (Amano Motonosuke, 1992). The following is a tentative analysis.

Matsuoka Joan (1668–1746) was the first Japanese herbalist to discover the value of “famine management”. He extracted the content of *Jiuhuang Bencao* from the *Complete Treatise on Agriculture*, and collated and named the plants contained in it after examining their Japanese names. In 1716, Zhou Xianwang’s *Jiuhuang Bencao* was first published, and it was the first Japanese translation of *Jiuhuang Bencao*. This edition followed the layout of the original Chinese edition, with illustrations on the right and explanatory text on the left. Each plant entry gave a detailed record of the name, origin, morphological characteristics, and how it could be used as food during times of famine. To suit the reading habits of Japanese readers, an explanation was also added at the end of each plant entry, providing further details about the plant.

Matsuoka Joan’s student Ono Ranzan (1729–1810) used multiple versions of *Jiuhuang Bencao* as the basis for his own work, which was published in 1799 under the title *Supplement to Jiuhuang Bencao*. This book not only references multiple versions to check and correct errors in Matsuoka Joan’s work, but also supplements the missing fruit plants with medicinal plants such as “cherry tree”. This can be seen in: I examined various books corrected the errors and supplemented the omissions. The old printings of the section on fruit had been written to help people suffering from hunger and omitted the shapes of the plants. It is intended as a supplement to the Complete Treatise on Agriculture. Now I have supplemented it from this book and called it *Supplement to Jiuhuang Bencao* (Ono Ranzan, 1799). After the death of Matsuoka Joan, Ono Ranzan was determined to carry on his master’s work. At the age of 26, he founded the private school “Zhongfangxuan” in Kyoto. In 1799, Ono Ranzan was summoned by the Tokugawa bakufu to serve as a medical officer in Edo, and at the same time

taught materia medica at the Medical Hall, which greatly contributed to the further spread of *Jiuhuang Bencao* in Japan.

Ono Ranzan's grandson, Ono Keiune (1774-1852), studied herbal medicine with his grandfather from an early age, laying an important foundation for his lifelong research in medicine. In 1842, *Jiuhuang Bencao Enlightenment*, dictated by Ono Keiune and transcribed by his son, was officially published. As an annotated version, the core purpose was to enable ordinary people to understand the existence of these plants and their practical value in emergencies. The book is divided into 14 volumes and records a total of 488 famine-relief plants, including 414 plants from *Jiuhuang Bencao*. It details information such as the shape of the plant, medicinal methods, and similar species.

#### 4. Reproducing Knowledge from *Jiuhuang Bencao*

Knowledge reproduction is a process that promotes the dissemination of knowledge. Subjects in different social situations or environments process and diffuse ambiguous knowledge from different perspectives and standards, transforming it into explicable knowledge (Ma Zhonghong & Sun Li, 2023). It is not just a simple reproduction of knowledge, but more importantly, a reinterpretation and application of existing knowledge in a new environment. As an important work of botany and pharmacology, the introduction of *Jiuhuang Bencao* to Japan not only provided Japan with a wealth of knowledge in botany and pharmacology, but also inspired Japanese scholars to explore and study local plant resources. Through absorption, integration and innovation, they created a series of derivative works.

##### 4.1 Derivative Work of Famine Relief

*Bikanroku* is a book on famine relief written by Hatsusegawa Kenzo (1851-1924) and published in 1904. The book makes extensive reference to the research achievements of predecessors and contemporaries, and lists a total of 84 bibliographies such as *Jiuhuang Bencao* and *Compendium of Materia Medica* in the 'Bibliography' section. The book is divided into 9 volumes and 1 appendix, introducing 132 species of wild plants such as niupixiao, chubaihe, and tianmen dong, and 64 species of toxic plants such as baiqucai. The wild plants are divided into 3 volumes, which record the roots, leaves and stems of edible plants in order. Each part of the plant species is first introduced in order, and then the names, places of origin, characteristics, eating methods and effects of the plants are recorded in detail using Japanese and Chinese names. In addition, according to the actual situation of the Japanese island country, there is also a separate section on seaweed and other seafood as emergency food. It is worth mentioning that the book also has a separate analysis table that analyzes common foods, such as a detailed table of the moisture, protein, oil and other content of soybeans, tofu, etc., to help people identify the nutritional content of plants and to help people maintain basic nutrition in years of famine.

*Jiuhuang Lue* is a famine relief work compiled by Sassa Johakuan (1785-1861) in 1833. Sassa Johakuan compiled this book based on his medical experience while serving as the director of the Sendai Domain's Medical Hall's herb garden in Mutsu (present-day Miyagi Prefecture). Many of the famine relief plants in the book are cases he researched in Japan. It classifies 203 types of plants and grasses that can be eaten during famines, and each plant is annotated with a corresponding Japanese name in addition to the Chinese character name. The classification method is based on the arrangement of *Jiuhuang Bencao* and is divided into the grass department and the wood department. Referring to the classification method of each part, it is subdivided into two cases: "both roots and leaves are edible" and "both leaves, fruits and skins are edible" according to the edible parts. In addition, it also provides detailed descriptions of the shapes, methods of consumption and medicinal effects of famine relief plants such as *Isatis tinctoria*, providing the common people with a valuable resource for coping with famine and alleviating illness in years of famine. The publication of the book also provided some experience in using plants to relieve famine at a time when the Tenpo famine broke out.

*Minkanbikanroku* was written by Takebe Seian (1712-1782) and published in 1771, although it was completed in 1755. In 1755, an abnormal climate in the northeast of Japan led to a significant drop in food production and a severe famine. Witnessing the dire situation of the people, Takebe Seian compiled this book. The book is divided into two volumes. The first volume mainly introduces the cultivation methods, medicinal effects and methods of consumption of famine relief crops; the second volume mainly records various rescue methods that are essential in famine years, such as rescue methods for people who have died from exposure to water, eating raw pine and cypress leaves, and eating grass and tree leaves. The method of eating grass and tree leaves comes from *Jiuhuang Bencao*.

*The Agricultural Encyclopedia* is a large-scale agricultural book written by Miyazaki Yasusada (1623-1697) and first published in 1697. It consists of 10 volumes and an appendix. The content mainly includes farming essentials, soil and seed types, water conservancy and harvesting. A diagram of each plant is drawn, which occupies almost one-third of the book. Although the content of the book mostly refers to the *Complete Treatise on Agriculture*, it is more based on Miyazaki's own 40-year farming experience and advanced agricultural

techniques from all over Japan, making it rich and practical. For example, a total of 19 types of crops are recorded, including more than ten types of crops such as rice, wheat, and soybeans. In contrast, the lack of crops such as spinach and beets may be due to the unsuitability of Japan's soil and water. *The Agricultural Encyclopedia* focuses on quoting ancient Chinese classics, emphasizing the importance of agricultural practices and other common features, as well as emphasizing the integration of the natural environment and agricultural development. It has had an important impact on the development of agriculture in Japan during the Edo period.

#### 4.2 Japanese Native Writings

The history of the introduction of Chinese materia medica to Japan is relatively long, and the influence of exchanges reached a peak during the Edo period. Under the influence of Chinese materia medica, Japan saw the emergence of famous medical experts such as Kaibara Eiken and Iwasaki Kanen, who explored and developed the country's own materia medica. They organically combined Chinese knowledge of famine relief with Japan's own resources, compiling works that have achieved great success in the history of Japanese materia medica.

In 1709, at the age of nearly 80, Kaibara Eiken (1630-1714) completed the *Yamato Honzo*. The book has 21 volumes in total, including 16 volumes of the main text, 2 volumes of illustrations, and 3 volumes of drawings of various products. This work was completed by Kaibara Eiken on the basis of extensive reading of books related to Materia Medica and reference to the writings of his predecessors. The book records a total of 1,362 types of herbal medicine in 37 categories, including 358 types of medicine produced locally in Japan. The source of each specific medicine is marked in the book, with Japanese-produced medicines marked "Japanese product" and those from China marked "foreign". For example, volume 4 quotes *Jiuhuang Bencao* as saying, Mier dou is mentioned in *Jiuhuang Bencao* and was introduced from China in recent years. It matures in late autumn, with abundant fruit. The petals are light purple and the plant spreads out. It is cooked together with the pods. In addition, he stressed the importance of empirical observation. For example, in volume 5, it is written about "Tiantai garlic": "It is non-toxic and does not smell. It bears white flowers and black seeds with a spicy taste. According to *Jiuhuang Bencao*, it is called shan cong."

In 1828, Iwasaki Kanen (1786-1842) completed Japan's first illustrated botanical encyclopedia, *Honzou Zufu*. The book contains 96 volumes, 2,239 plant species and about 2,000 illustrations. "He searched the mountains and fields, moved plants from one garden to another, and planted them in pots. In total, he collected more than 2,000 species (Iwasaki Kanen, 1922)." It can be seen that the vast majority of the plants depicted in the book were personally cultivated and carefully observed by the author himself. The book records a wide variety of imported medicines, such as licorice root, which is produced in Fuzhou and Nanjing; and atracylodes, which is produced in two places in China and one place in Japan. This avoids medication errors caused by confusion between species. For medicines that are found in both China and the West, the book records both Eastern and Western medicines, and notes the source and title. Among the medicines cited in *Jiuhuang Bencao* are fine leaf ginseng, apricot leaf ginseng, and ground ginseng.

### 5. Conclusion

*Jiuhuang Bencao* is not only an outstanding botanical work in the agricultural books of the Ming Dynasty, but also a microcosm of knowledge, technology, and cross-cultural exchange in that era. In-depth study of the publication and dissemination of *Jiuhuang Bencao* in the Edo period of Japan and the reproduction of its knowledge shows how a scientific work can transcend national boundaries and be accepted, absorbed and re-innovated by scholars from different cultural backgrounds. This process not only reflects the transmission and popularization of knowledge, but also the mutual learning and reference between different cultures in the face of similar problems. This not only enriched the knowledge of Japanese botany and pharmacology, but also provided valuable experience and inspiration for modern plant resource development and disaster management. Today, in-depth exploration of the modern practical value of *Jiuhuang Bencao* is still of great significance for promoting the research of agronomy and botany and promoting understanding of the historical exchanges between China and Japan in the fields of agronomy, pharmacology and other fields.

### References

- Amano Motonosuke, (1992). *A Study of Ancient Agricultural Books*. Japan: Agricultural Publishing Press.
- Deng Tuo, (2012). *History of Famine Relief in China*, p. 25. Wuhan: Wuhan University Press.
- He Huiling, (2014). The inheritance of *Jiuhuang Bencao* documents in China and Japan. Master's Thesis, China Academy of Traditional Chinese Medicine.
- Iwasaki Kanen, (1922). *Honzou Zufu*. Tokyo: Suharaya Shobei and Yamashiroya Sabobei.
- Li Hongtu, (2024). Knowledge reproduction from the perspective of global thought flow. *Frontiers of Thought and Theory*, (01), 127-131.
- Luo Guihuan, (1985). Zhu Su and his *Jiuhuang Bencao*. *Research on the History of Natural Sciences*, (02),

189-194.

Ma Zhonghong, Sun Li, (2023). Online feeding: a perspective on the digital divide based on knowledge reproduction. *Academic Research*, (04), 59-66.

Ono Keiune, (1842). *Jiuhuang Bencao Enlightenment*. Japan.

Ono Ranzan, (1799). *Supplement to Jiuhuang Bencao*. Japan.

Wang Defei, (2014). A brief discussion of the scientific thought of “*Jiuhuang Bencao*”. *Research on the Dialectics of Nature*, 30(3), 89-94.

Wang Jinxiu, Tang Yancheng, (2021). *Jiuhuang Bencao yizhu*, p. 2. Shanghai: Shanghai Classics Publishing House.

Wang Xingguang, Peng Yong, (1996). The life and scientific path of Zhu Su. *Journal of Zhengzhou University (Philosophy and Social Sciences Edition)*, (02), 9-15.

Yan Xianzhang, (1993). A tentative study of the characteristics of the compilation of *Jiuhuang Bencao* in the Ming Dynasty. *Journal of Henan University*, 33(4), 109-114.

### Copyrights

Copyright for this article is retained by the author(s), with first publication rights granted to the journal.

This is an open-access article distributed under the terms and conditions of the Creative Commons Attribution license (<http://creativecommons.org/licenses/by/4.0/>).