



# Analysis of the Current Development Status of *Gastrodia Elata*: Bl. F. *Glauca S. Chow* Industry in Xiaoliangshan Area of Leshan City

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## Abstract

In recent years, the Xiaoliangshan Area of Leshan City has actively explored local characteristic product resources, developed series *Gastrodia elata*. Bl. f. *glauca S. Chow* products, and achieved remarkable results in helping people increase income and enriching local characteristic agricultural products, adding impetus and vitality to rural revitalization.

**Key words:** *Gastrodia elata*. Bl. f. *glauca S. Chow*; Xiaoliangshan Area; Industrial Development

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## INTRODUCTION

*Gastrodia elata* Bl. is also known as Dingfengcao, Limu, Bailongpi, Mingmingma, etc., is a perennial heterotrophic herbaceous plant in the orchidaceae family, distributed in most regions of China. At present, there are four main varieties of *Gastrodia elata* Bl. planted in China, namely *Gastrodia elata* Bl. f. *glauca S. Chow*, *Gastrodia elata* Bl. form. *viridis* (Makino) Makino, *Gastrodia elata* Bl. form. *flavida S. Chow*, and *Gastrodia elata* Bl. f. *alba S. Chow*.

The *Gastrodia elata* Bl. f. *glauca S. Chow* has outstanding characteristics such as good product shape, high drying rate, and excellent quality, making it an excellent variety resource of *Gastrodia elata* Bl. f. *glauca S. Chow* (Qiao, 2008, p.65). The Xiaoliangshan Area of Leshan City has mature techniques for sexual and asexual reproduction of *Gastrodia elata* Bl. f. *glauca S. Chow*, and has successfully obtained artificial cultivation techniques for wild *Gastrodia elata* Bl. f. *glauca S. Chow*. The area does not use pesticides, additives, pigments, etc., and its *Gastrodia elata* Bl. f. *glauca S. Chow* content is high. In recent years, the local government has regarded the cultivation of *Gastrodia elata* Bl. f. *glauca S. Chow* as an important means of prosperity, actively developing *Gastrodia elata* Bl. f. *glauca S. Chow* industry, and initially building an industrial chain that integrates the cultivation, processing, and sales of *Gastrodia elata* Bl. f. *glauca S. Chow* strains. The local government has also researched and developed a series of *Gastrodia elata* Bl. f. *glauca S. Chow* products to increase the added value of *Gastrodia elata* Bl. f. *glauca S. Chow*. Through industrial development, it has driven local farmers to increase employment and income, paving a new path for industrial assistance in rural revitalization.

## 1. CURRENT DEVELOPMENT STATUS OF *GASTRODIA ELATA* BL. F. *GLAUCA S. CHOW* INDUSTRY IN XIAOLIANGSHAN AREA OF LESHAN CITY

### 1.1 The Geographical Environment in Which *Gastrodia elata* Bl. f. *glauca S. Chow* Grows Locally

The Xiaoliangshan Area in Leshan City includes Ebian Yi Autonomous County, Mabian Yi Autonomous County, Jinkouhe District. Its unique geographical location, topography, climate environment, and soil conditions

have created the unique quality characteristics of *Gastrodia elata* Bl. f. *glauca S. Chow*, which is distributed in various provinces and regions in China, including Yunnan, Guizhou, Sichuan, Chongqing, Hubei, etc. The *Gastrodia elata* Bl. f. *glauca S. Chow* has a sweet taste, calming, heart returning, and meridian properties, and has the effects of calming the liver, extinguishing wind, calming shock, relieving pain, nourishing qi and blood, and promoting blood circulation. The content of gastrodin in *Gastrodia elata* Bl. f. *glauca S. Chow* produced in this area is high. Studies have shown that the highest content of gastrodin in the *Gastrodia elata* Bl. f. *glauca S. Chow* produced in the Jinkouhe District is 0.72%, which is much higher than the standard in the Chinese Pharmacopoeia (Qiao, 2009, pp.161-162). The *Gastrodia elata* Bl. f. *glauca S. Chow* products in Jinkouhe District have also been awarded the title of “National Geographical Indication Protection Product”. The protection scope of geographical indication products includes four townships in Jinkouhe District, Leshan City, Sichuan Province, including Yongsheng Township, Jinhe Township, Gong’an Yi Township, and Jixing Township.

### 1.2 The Planting Situation of *Gastrodia elata* Bl. f. *glauca S. Chow* in the Local Area

The *Gastrodia elata* Bl. f. *glauca S. Chow*, a primitive local variety that was collected, cultivated, and bred in the early 1980s in the Jinkouhe District of Xiaoliangshan Area, has undergone more than 40 years of research. The technology has gradually transitioned from easy to difficult, from indoor planting to outdoor planting, from low mountains and low altitudes to high mountains and high altitudes, overcoming various technical difficulties. The artificial cultivation technology of the *Gastrodia elata* Bl. f. *glauca S. Chow* has become increasingly mature, and large-scale artificial planting has gradually begun.

In Jinkouhe District, a *Gastrodia elata* Bl. f. *glauca S. Chow* cooperative has been established locally. In the Banchangping Village of Jinkouhe District, the professional cooperative integrates *Gastrodia elata* Bl. f. *glauca S. Chow* planting, research, processing, and sales, with a sound system and standardized operation. The registered capital of the cooperative is more than 3 million yuan, and it has a multi-functional comprehensive factory building covering thousands of square meters, including bacterial cultivation, powder cultivation, *Gastrodia elata* Bl. f. *glauca S. Chow* processing, warehouse, and frozen storage; The cooperative has three planting bases, including hundreds of acres of high-quality planting bases. The cooperative produces about 200,000 kilograms of wild commodity *Gastrodia elata* Bl. f. *glauca S. Chow* and 40,000 kilograms of planted *Gastrodia elata* Bl. f. *glauca S. Chow* annually, with a production value of over 20 million yuan. There are currently over a hundred members of the cooperative, and more than

2000 growers in Jinkouhe District and other areas have participated in the cultivation of *Gastrodia elata* Bl. f. *glauca S. Chow* (Xian, 2023, p.2). Jinkouhe District has also established companies specialized in developing the black *Gastrodia elata* products, such as Jinkouhe District Senbao Wild Plant Development Co., Ltd., which is a technology-based enterprise integrating *Gastrodia elata* Bl. f. *glauca S. Chow* cultivation, processing, and sales. At present, the company has established a breeding base, a standardized and industrialized three-dimensional steel frame planting base, a processing base, and also the largest *Gastrodia elata* Bl. f. *glauca S. Chow* seed source base in the country.

In Ebian Yi Autonomous County, local cooperation funds from the east and west, as well as collective economic industry support funds from villages such as Huangni and Mingxin, have been integrated to establish *Gastrodia elata* Bl. f. *glauca S. Chow* industry demonstration park. Over ten million yuan has been invested to build *Gastrodia elata* Bl. f. *glauca S. Chow* breeding and planting workshops, with an annual output value exceeding ten million yuan. Mingxin Village has also introduced Sichuan Jianbao Traditional Chinese Medicine Co., Ltd. to carry out provincial-level scientific research projects, utilizing the idle roofs of photovoltaic power plants to establish a “complementary agricultural and photovoltaic” development model of “on board power generation and under board planting”. Leading dozens of surrounding farmers to develop understory cultivation of *Gastrodia elata* Bl. f. *glauca S. Chow*, not only increasing collective economic income for Mingxin Village, but also drives villagers to develop courtyard economy and increase income (Yan, 2023, p.7).

In recent years, many villagers in Mabian Yi Autonomous County have also started planting *Gastrodia elata* Bl. f. *glauca S. Chow*. In 2023, the *Gastrodia elata* Bl. f. *glauca S. Chow* trial planting base in Wuma Village was completed and achieved a bumper harvest.

### 1.3 Development Status of *Gastrodia elata* Bl. F. *Glauca S. Chow* Products

In order to form an industrial agglomeration effect, local research and development have formed a series of products such as fresh *Gastrodia elata* Bl. f. *glauca S. Chow*, dried *Gastrodia elata* Bl. f. *glauca S. Chow*, *Gastrodia elata* Bl. f. *glauca S. Chow* powder, and *Gastrodia elata* Bl. f. *glauca S. Chow* wine. The surface of locally produced fresh *Gastrodia elata* Bl. f. *glauca S. Chow* is yellow or light-yellow brown, elliptical or short columnar in shape, with black brown horizontal ring patterns, obvious circular needle like shapes, a large and obvious round navel, and a mild and sweet taste. The surface of the dried product is yellow white or light yellow brown, elliptical, slightly flat, wrinkled and slightly curved, with longitudinal wrinkles and horizontal

ring patterns arranged by latent buds. The texture is hard, keratinous, with a slight odor and a sweet taste.

In addition, the local area also combines *Gastrodia elata* Bl. f. *glauca* S. Chow with local specialty agricultural products such as cured meat, fish, beef, potatoes, mountain chicken, honey, tea, etc., and has developed a series of *Gastrodia elata* Bl. f. *glauca* S. Chow dishes such as cold dishes, hot dishes, and snacks, totaling more than 30 dishes. For example, cold dishes include *Gastrodia elata* Bl. f. *glauca* S. Chow thorn raw, hot dishes include *Gastrodia elata* Bl. f. *glauca* S. Chow chicken soup, *Gastrodia elata* Bl. f. *glauca* S. Chow chicken soup stir fried bacon, and snacks include *Gastrodia elata* Bl. f. *glauca* S. Chow chicken soup silver cake, *Gastrodia elata* Bl. f. *glauca* S. Chow chicken soup corn juice, etc, maximize the utilization of *Gastrodia elata* Bl. f. *glauca* S. Chow products.

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## 2. THE PROBLEMS IN GASTRODIA ELATA BL. F. GLAUCA S. CHOW INDUSTRY IN THE XIAOLIANGSHAN AREA OF LESHAN CITY

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### 2.1 The Industrial Chain Is not Yet Complete Enough

The *Gastrodia elata* Bl. f. *glauca* S. Chow industry chain is not perfect enough. The *Gastrodia elata* Bl. f. *glauca* S. Chow mainly relies on traditional sun drying, and slicing processing methods, and its product added value is low, which cannot meet market demand. Due to the lack of deep processing technology, The *Gastrodia elata* Bl. f. *glauca* S. Chow products lack competitiveness in the market and cannot obtain higher profits. The product research and development, production, marketing and circulation links are weak, and the protection of production technology and product brand maintenance urgently need to be strengthened.

### 2.2 Standardization Construction Still Needs Improvement

At present, the standardization construction of *Gastrodia elata* Bl. f. *glauca* S. Chow planting and processing in the Xiaoliangshan Area of Leshan City is relatively lagging behind, mainly relying on traditional planting and processing methods. The management and cultivation of *Gastrodia elata* Bl. f. *glauca* S. Chow planting environment, bacterial strains and materials, selection of seed, production technical guidelines, field management, disease and pest control, *Gastrodia elata* Bl. f. *glauca* S. Chow harvesting and processing, product quality requirements, test methods and inspection rules, grade evaluation further standardization is needed in areas such as labeling, packaging, and sales, and there is an urgent need for systematic research and development of standards.

## 2.3 Insufficient Technological Innovation Capability

The research and development investment in *Gastrodia elata* Bl. f. *glauca* S. Chow industry is low, and there is a lack of independent research and development technology platforms and professional talents. The scientific research foundation for *Gastrodia elata* Bl. f. *glauca* S. Chow cultivation and production is weak, with insufficient scientific and technological support, and a shortage of professional and technical talents (Hu, Gu, & Zheng, 2017, p.4). The production of *Gastrodia elata* Bl. f. *glauca* S. Chow without standards to follow leads to low quality of related products and low technological added value; However, there is a lack of safe and effective research data, which cannot meet the needs of consumers at different levels.

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## 3. SUGGESTIONS FOR THE DEVELOPMENT OF GASTRODIA ELATA BL. F. GLAUCA S. CHOW INDUSTRY IN XIAOLIANGSHAN AREA OF LESHAN CITY

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### 3.1 Make Good Development Plans for *Gastrodia elata* Bl. f. *glauca* S. Chow Industry

Local governments need to further coordinate and plan the overall and annual development goals of *Gastrodia elata* Bl. f. *glauca* S. Chow industry, clarify development ideas, and guide a group of key enterprises and cooperatives to carry out the cultivation, processing, and sales of *Gastrodia elata* Bl. f. *glauca* S. Chow. In terms of industrial layout, it is necessary to adapt to local conditions, based on resource advantages, highlight product characteristics, accelerate the development of *Gastrodia elata* Bl. f. *glauca* S. Chow industry in key towns and villages in the area, and build a number of *Gastrodia elata* Bl. f. *glauca* S. Chow industry towns and demonstration villages. Improve supporting infrastructure such as water, electricity, and roads, accelerate the construction and improvement of facilities and equipment such as *Gastrodia elata* Bl. f. *glauca* S. Chow planting bases and processing logistics, and build large-scale and standardized production bases. In terms of variety improvement, it is necessary to improve the varieties of *Gastrodia elata* Bl. f. *glauca* S. Chow that are suitable for local cultivation based on market demand and adaptability. Through variety improvement, yield and quality can be increased to meet market demand. In terms of planting technology, combined with local climate conditions, make reasonable use of land resources, and adopt scientific planting techniques. Including soil improvement, rational fertilization, pest and disease control, etc., to improve the yield

and quality of *Gastrodia elata* Bl. f. *glauca S. Chow*. Strengthen market research, understand market demand and competition through market research, and develop reasonable sales strategies. We can expand our sales channels and increase the added value of our products by collaborating with pharmaceutical companies, hospitals, and others.

### **3.2 Improve the Construction of Standardization System**

According to national or industry standards, based on the growth characteristics and native environment of *Gastrodia elata* Bl. f. *glauca S. Chow*, we vigorously promote pollution-free cultivation of the black *Gastrodia elata*, focus on developing understory and ecological greenhouse planting, improve the quality of *Gastrodia elata* Bl. f. *glauca S. Chow*, and include the standardization work of *Gastrodia elata* Bl. f. *glauca S. Chow* in the training courses of farmers, continuously deepening their understanding of *Gastrodia elata* Bl. f. *glauca S. Chow* planting standards and regulations. Establish and improve the local standard system for *Gastrodia elata* Bl. f. *glauca S. Chow* cultivation, prioritize the formulation of standards, take the formulation, implementation, and supervision of planting regulations as the main line, and run through the construction of the “Sichuan Province Excellent Agriculture Standardization Demonstration Zone” for *Gastrodia elata* Bl. f. *glauca S. Chow* in Jinkouhe District. Hire experts from universities, research institutes, and industries to form a standardized construction working group for *Gastrodia elata* Bl. f. *glauca S. Chow* in Jinkouhe District, supplement the standards, and implement national, industry, and relevant standards. Standardize the planting, processing, and sales of *Gastrodia elata* Bl. f. *glauca S. Chow* in Jinkouhe District from the aspects of planting environment, management and cultivation of strains and materials, selection of seeds, production technical guidelines, field management, pest and disease control, harvesting and processing of *Wutianma*, product quality requirements, test methods and inspection rules, grade evaluation, labeling, packaging, and sales. Strengthen the supervision and implementation of standards, strengthen the supervision of standardized management throughout the entire process of planting, production, and processing in the demonstration zone, continuously improve the standard system, and take the company as the leader, from the base to farmers, to processing enterprises, and to the market, to ensure the quality of products throughout.

### **3.3 Vigorously Cultivate Production and Operation Entities**

Guide and cultivate a group of leading enterprises and specialized and innovative enterprises; Guided by the

market, establish industry alliances such as leading enterprises, professional cooperatives, and family farms, and play a demonstrative and leading role in large-scale layout, standardized production, facility development, deep processing, market circulation, product sales, and brand construction. Support a group of business entities with good growth potential. Support the expansion of bases, improvement of facilities, extension of chains, development of products and market expansion, and support deep cooperation between enterprises across regions and upstream and downstream. Make full use of the policy of cooperation between the East and the West, organize agricultural production and operation entities in Jinkouhe District to participate in agricultural product production and sales docking negotiations, exhibitions, trade fairs, etc. in the east, and leverage the new approach of “live streaming+e-commerce” to comprehensively promote Jinkouhe agricultural specialty products to go out of the Grand Canyon, out of the Dawa Mountain, and into the whole of China. Through the integration of production and sales in the eastern and western regions, we continuously explore the eastern market, promote the development of the agricultural industry in Jinkouhe District towards scale, intensification, and branding, support the growth of a group of distinctive, large-scale, and competitive market operators, and promote stable and increased income for farmers.

### **3.4 Strengthen Cooperation with Universities and Research Institutes**

Increase investment in research on *Gastrodia elata* Bl. f. *glauca S. Chow*, improve the development and utilization level of *Gastrodia elata* Bl. f. *glauca S. Chow* products, strengthen cooperation with local and domestic and foreign universities, research institutes, and other institutions in Leshan, actively carry out pharmacological research on *Gastrodia elata* Bl. f. *glauca S. Chow*, genetic database construction of germplasm resources, and strengthen the research and formulation of standards for *Gastrodia elata* Bl. f. *glauca S. Chow* products and related fields.

### **3.5 Increase Policy Support Efforts**

Local governments should formulate preferential policies and incentive measures in key areas such as planting, processing, circulation, technology, project construction, and investment attraction, and carry out pilot projects; Strengthen financial security, integrate agricultural related funds, cooperation and assistance funds between the East and the West, etc., to support the development of the *Gastrodia elata* Bl. f. *glauca S. Chow* industry; Strengthen project planning, rely on projects, actively seek national, provincial, and municipal policies, projects, and funding support, and inject sustained momentum into the high-quality development of the *Gastrodia elata* Bl. f. *glauca S. Chow* industry in the Xiaoliangshan area of Leshan City.

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## EPILOGUE

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In recent years, the Xiaoliangshan Area of Leshan City has focused on developing modern agriculture with local characteristics and advantages, adapting to local conditions, and vigorously promoting the development of modern agriculture in mountainous areas. With the characteristic “gold” products of “agriculture”, it has led the people on the road to poverty alleviation and health. In 2021, five departments including the Sichuan Provincial Health Commission and the Provincial Administration for Market Regulation issued the “Pilot Plan for Material Management of *Gastrodia elata*, *Dendrobium officinale*, and *Ganoderma lucidum* as Traditional Chinese Medicinal Materials”, which opened the door for *Gastrodia elata* Bl. f. *glauca* S. Chow products to obtain food production licenses and be listed with certificates. I believe that in the near future, *Gastrodia elata* Bl. f. *glauca* S. Chow industry in the Xiaoliangshan Area of Leshan City will achieve more results in standardization, standardization, and specialization.

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