

# Analysis on Protection of GI Product Xiangshan Spirit and Suggestions of Its Industrial Supervision

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**Abstract** From name, historic stories, reputation, traffic and location factors, and natural factors as production and processing, water, raw material and yeast, this paper firstly analyzes key factors for protection of GI product Xiangshan Spirit. Then, it discusses differences in quality characteristics between Xiangshan Spirit and other rice flavor type spirits. Besides, industrial development of Xiangshan Spirit is analyzed from residues of pesticides, quality of water for making wine, and exclusive use of geographical indication Xiangshan Spirit. Finally, it puts forward following suggestions, including formulating and implementing local standard *GI Product Xiangshan Spirit*, strengthening quality control over rice raw material, implementing "enterprise + base" industrial model, and support group enterprises with government as leader.

**Key words** Xiangshan Spirit, Geographic Indication, Analysis, Industrial supervision, China

Xiangshan Spirit originates from Quanzhou County of Guangxi Province, also called Quanzhou Xiangshan Spirit. It is a representative of Chinese yeast rice flavor type spirit together with Guilin Sanhua Spirit. Xiangshan Spirit adopts quality rice as raw material. The spirit liquor is colorless, clear and transparent. With pure rice flavor and soft and sweet taste, Xiangshan Spirit may intoxicate us, but keep us sober-minded. To effectively protect the traditional product with historical and cultural background and promote sustainable development of Xiangshan Spirit industry, at the suggestion of Guangxi Entry-Exit Inspection and Quarantine Bureau, Quanzhou County government launched protection of GI product Xiangshan Spirit in May of 2008. On December 29, 2010, *Announcement No. 167 (2000) of General Administration of Quality Supervision, Inspection and Quarantine of the People's Republic of China* approved the protection of GI product Xiangshan Spirit, and the protection area covers existing administrative areas of Quanzhou County.

## 1 Relevant concepts of Geographic Indication production protection

Geographical Indication (GI) products refer to those products originated from specific region and designated with geographical name, and quality, reputation or other special nature of these products depend on natural and humanistic factors of this region. Most GI products are agricultural products, foods, arts and crafts products. A GI is a quality mark, and its proper-

ty system is firstly originated from France for special protection of alcohol products<sup>[1]</sup>. In 1883, *Paris Convention for the Protection of Industrial Property* initially provided legal protection for geographical indication from the point of anti-unfair competition. With over a century of theoretical development and application practice of GI product protection, a series of international conventions have been signed, such as *Madrid Agreement for the Repression of False or Deceptive Indications of Source on Goods* (1891), *The Stresa Convention* (1951), *Lisbon Agreement for the Protection of Application and Their International Registration* (1958), and *Agreement on Trade-related Aspects of Intellectual Property Rights* (Trips Agreement, 1986). So, the international GI protection system framework has been established. With GI protection, the product will have an increase of 20% in economic benefits.

There are generally two types of GI products. One type is planting and cultivation products from local areas, and the other is products produced and processed in accordance with local special process and raw materials wholly or partly from local or other areas. The essence of GI product protection is the concrete manifestation of origin designation system in economy<sup>[2]</sup>.

A famous, special, and excellent product should generally possess four elements: geographical name (designated with the origin), special quality, reputation, natural and humanistic factors. Special quality is the basis for GI protection, and the connection between natural factor and/or humanistic factor and special quality is the key to GI protection. Natural factors mainly include soil, terrain, climate, and water quality; humanistic factors include social factor and cultural factor, mainly historical tradition, special production process, formula, etc. The quality or other special features of most agricultural type GI products are decided by natural factors; the quality of arts and crafts GI products depends on humanistic factors; and the quality of food type GI products is determined jointly by natural and humanistic factors.

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## 2 Analysis on key factors for protection of GI product Xiangshan Spirit

### 2.1 Name, historic stories, reputation, traffic and location factors of Xiangshan Spirit

**2.1.1** Origin of name of Xiangshan Spirit. Xiangshan Spirit got its name from Xiangshan Temple at the foot of Xiangshan Mountain in Quanzhou County, Guilin City of Guangxi Province. Xiangshan Temple was built in the first year of Zhide period (756 A. D.) of Tang Dynasty. By now, it has a history of over 1 200 years. At that time, it was named "Pure Land Temple" and had long enjoyed high reputation of "Making Tang and Song Dynasties Prosperous". According to legend, after the eminent and learned monk Quanzhen built Xiangshan Temple, spring water for washing alms bowl in Xiangshan Temple became "Dragon water". Drinking this water, many diseases can be treated, and common people used Xiangshan spring water to cook wine. In Jiaqing Period of Qing Dynasty, Xiangshan Temple Shoufo Wine sold well. In *Quanzhou Chronicle* of the eighth year of Jiaqing Period (1803), it stated that "in the end of Huoshao bridge of Quanzhou, there is workshop of Xiangshan Shoufo Wine, whose demand is over supply". In the period of Republic of China of late Qing Dynasty, apart from Quanzhou Xiangshan Shoufo Wine workshop, other workshops like Shunchang and Xingchang began to take shape and produce Xiangshan Shoufo wine. In 1951, workshops in the county combined to form No. 1 and No. 2 associations, and changed Xiangshan Shoufo Wine to "Xiangshan Spirit" [3].

**2.1.2** Historic stories of Quanzhou "Brewing with Rice Dregs". Quanzhou wine making can be traced back to "Brewing with Rice Dregs". Xiangshan Spirit, formerly "Good Ruilu Wine" in ancient times, is made through constant modification of traditional process inherited from ancient times. In Chu and Qin periods, wine making industry has been booming in Quanzhou and drinking custom was prosperous. By Five Dynasties, pot cover dripping process was used to distill and get wine. By the beginning of Tang Dynasty, Quanzhou people have universally understood crock steaming process. There is an old proverb in Quanzhou: "Brewing with rice dregs in Qin period, Xiangshan Spirit will make you have thoughts of love even you get very old if drinking with moderate amount". In 1985, villagers of Fenghuang Town in Quanzhou excavated many drinking vessels in Yongzhou Zhao Sicang Tomb, which belongs to Zhenguan period of Tang Dynasty. Using drinking vessels as funerary objects is rare in ancient tombs, so this tomb is rare. It indicates as early as the beginning of Tang Dynasty 1 300 years ago, wine making and drinking have been favored by Quanzhou people.

**2.1.3** Reputation. Production of Xiangshan Spirit has a long history. *Gui Hai Yu Heng Annals of Wine* written by Fan Chengda (famous poet in the Southern Song Dynasty) describes wine making industry in Quanzhou. Zhou Qufei, a geographer in the Southern Song Dynasty, recorded wine making situations there in Ling Nan Dai Da. Apart from Fan Chengda, other famous poets like Huang Tingjian, Gu Lin and Yan Song have drunk Xiangshan Spirit and written poems about it. When

sent to Guangdong and Guangxi Provinces, Yan Song visited his kind teacher Zhang Sancan and wrote verses like "Stay too long in Xiangshan winehouse, forget spring chill in Lipu". In New Year's Eve of that year, Yan Song celebrated the New Year together with his teacher in Quanzhou. He said his lingering in Quanzhou for over ten days is due to deep love for his teacher and mellow and sweet Xiangshan Spirit. Gu Lin, one of three gifted scholars in Nanjing, wrote many poems to praise Xiangshan Spirit when he was relegated to Quanzhou from prefect of Kaifeng prefecture. In 1513, he wrote *Niannujiao - Meditating on the Past in Xiangshan*, the last sentence of which is still inscribed on cliff on Xiangshan. In 1649, kidnapped to Quanzhou for several months, King of Guilin, Zhu Youlang enjoyed drinking and wanted to drown care in the wine bowl every day. He left such sentence as "there is good wine, so forget winter and spring". From above stories, we can infer that Xiangshan Spirit has a history of at least 500 years.

After new China was founded, Xiangshan Spirit has won various honors at appraisal activities. For example, Xiangshan Spirit won Class A title in Guangxi wine appraisal on December 1 of 1961; it was consecutively awarded as national quality wine in the second, third, fourth and fifth Wine and Spirit Appraisal Conference from 1963; later, in 1979, 1984 and 1989, Xiangshan Spirit was consecutively awarded as national quality wine and has become famous spirit in Guangxi Province.

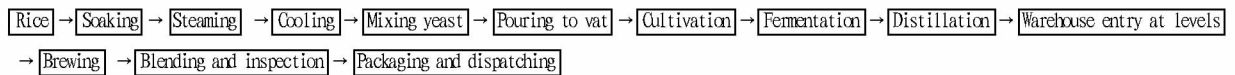
**2.1.4** Position of traffic hub promotes development of Xiangshan Spirit industry. Prosperity of Xiangshan Spirit industry in Quanzhou is not accidental. One of reasons should give credit to its traffic hub position. Quanzhou County is situated at traffic main artery between Central Plains and south of the Five Ridges. Endowed with natural barrier "the Five Ridges" at borders of Jiangxi, Hunan, Guangdong and Guangxi Provinces, the "Hunan and Guangxi Corridor" from Xiangjiang River to Quanzhou and from Xing'an to Guilin has once been the most convenient path to Guangdong, Guangxi, and Southeast Asia. Since Qin and Han periods, all government officials, merchants and travelers from Central Plains to south of the Five Ridges take this road, and foreign merchants, envoys, goods and tributes also pass through this road. The river section from Dongting Lake to Quanzhou is deep enough to sail big ships, while the section from Quanzhou to Xingan Lingqu and Guilin, only 5 tons of small ship can pass. No matter big ships or small boats, it requires loading and unloading in Quanzhou. A good many passengers detained in Quanzhou further promotes development of catering trade in Quanzhou, and no wonder the brewing industry is prosperous.

### 2.2 Production process

**2.2.1** Process flow. Process flow for brewing of Xiangshan Spirit is shown in Fig. 1.

**2.2.2** Technical requirements of production. Firstly use high quality rice locally planted as raw material, pour the rice into pool, soak with water for 30 minutes, wash out rice bran and dust, then put it into rice still and heat and cook with steam. After rice is cooked to rice grain, spread it onto cooling table to cool it to 35 °C. Add pure head mold white starter, uniformly mix,

then put it into vat (rice should reach about 3/5 of vat capacity). Leave a hole on the vat and cover the vat to carry out sacchariferous and fermentation process. After fermentation ripening, put it



**Fig. 1 Process flow for brewing of Xiangshan Spirit**

In the course of making Xiangshan Spirit, the most important sections are raw material selection, sacchariferous and fermentation process, and distillation. High quality rice grown in Quanzhou is used and foreign matters are washed out through soaking. In sacchariferous and fermentation process, strictly control the temperature, especially keep the temperature. In the course of distillation, gather distillate through collecting initial distillate and last distillate, to ensure quality of Xiangshan Spirit not influenced in the course of production. Xiangshan Spirit uses traditional small jar and vat to conduct sacchariferous and fermentation, with temperature controlled at 25 to 38 °C, sacchariferous time for 18 to 26 hours, and fermentation time for 10 to 12 days, to ensure high quality and unique taste of Xiangshan Spirit.

**2.3 Natural factors** Natural factors influencing Xiangshan Spirit mainly include water, yeast, fermentation process, time, temperature, humidity, natural environment, *etc.*, among which the water, raw material and yeast are most essential factors. The old saying goes that "water is blood of wine, rice is meat of wine, and yeast is like bone of wine".

**2.3.1 Water.** "Water is blood of wine". To make good wine, there shall be excellent water. Quanzhou, situated between Duchong and Yuecheng Ridges of south of Five Ridges, belongs to source regions of Xiangjiang River. There are green hills and clear water. In Quanzhou, tributaries to Xiangjiang River have clear water at bottom of riverbed. The water there is pure and sweet, contains mineral trace substances and little sand. It is free of pollution, not turbid, no foreign smell and no contaminant. The pH value is within 7 to 7.5, manganese up to 0.08 mg/L, zinc up to 0.6 mg/L, lead up to 0.08 mg/L, copper up to 0.8 mg/L, ferrum up to 0.15 mg/L, arsenic up to 0.02 mg/L, mercury up to 0.0008 mg/L, hexavalent chrome up to 0.015 mg/L, cyanide up to 0.02 mg/L, chloride up to 6.00 mg/L, fluoride up to 0.06 mg/L, nitrate (expressed in N) up to 5.0 mg/L, and total hardness up to 160 mg/L. It is unique water quality of Xiangjiang River that provides excellent "blood of wine" for Xiangshan Spirit and guarantees its unique taste. Besides, the water is collected from 2 to 3 m at bottom of riverbed of tributary to Xiangjiang River, and its quality meets provisions of Standards for Drinking Water Quality.

**2.3.2 Raw materials.** "Rice is meat of wine". Xiangshan Spirit adopts high quality rice produced in Quanzhou as raw material. Situated in 110°37' E to 110°29' E and 25°29' N to 26°23' N, Quanzhou has subtropical moist monsoon climate. There is a clear distinction between four seasons. Average temperature of the whole year is 17.8 °C. Annual average frost-free period reaches 299 days, and average annual rainfall days up to 163.3 days. In Quanzhou County, there are eight

into a cooking pot to distill. The cooked spirit will be inspected and assessed, then stored in warehouse. After storage for over one year, it may be blended to finished product.

types of soil, including red soil, yellow soil, limestone soil, meadow soil, alluvial soil and rice soil. Among these, the rice soil is major type for grain production. The rice soil in Quanzhou County contains rich organic matter (1.19% to 10.30%) and total nitrogen content is high (0.04% to 0.42%). Apart from these, it also contains 0.4 to 46.4 mg/kg quick-acting phosphate and 11 to 398 mg/kg quick acting potassium. The pH value is within 4.5 to 5.5. In addition, it contains rich mineral substance elements. Physicochemical property of soil is good and quite suitable for growth of rice. In such environment, rice has a long growth period. Rice grain is big and full. Average starch content is above 70%. Rice there gives off fragrance, so it is an ideal "meat of wine".

**2.3.3 Yeast.** "Yeast is like bone of wine". Yeast quality determines basic quality of Xiangshan Spirit. Original yeast comes from moldy or sprouted grains. Microbiological researches have found that large amount of amylase, saccharifying enzyme and protease secreted by microorganism can speed up conversion of starch and protein in grains into sugar and amino acid. Under the action of microorganism, these substances will generate ethanol, acetic acid, and ethyl acetate. Major fragrance of Xiangshan Spirit comes from  $\beta$ -phenylethanol and ethyl lactate, providing it with unique taste. Xiangshan Spirit takes pure head mold white starter as sacchariferous and fermentative agent, which is ideal "bone" of wine. It reduces content of fusel oil on the basis of other rice flavor type spirits.

Yeast of Xiangshan Spirit: pure head mold white starter. Fermenting power is 57% to 63% (calculated at 58 degree wine); alcoholic fermentative material adopts 0.5 to 1.0 ml/g yeast with water content not greater than 13%.

## 3 Quality features of Xiangshan Spirit and differences with other rice flavor type spirits

**3.1 Sensory features of Xiangshan Spirit** Xiangshan Spirit is colorless, clear and transparent, free of suspended substance and precipitate. It has mellow, soft and sweet flavor. Even intoxicated, you can keep sober-minded. It also has typical feature of rice-flavor type spirit.

**3.2 Physical and chemical indicators of Xiangshan Spirit** 41 degree to 55 degree; total acid g/L (calculated with acetic acid) not less than 0.50; total ester g/L (calculated with ethyl acetate) not less than 1.00; and ethyl lactate (g/L) not less than 0.50.

35 degree to 40 degree; total acid g/L (calculated with acetic acid) not less than 0.30; total ester g/L (calculated with ethyl acetate) not less than 0.80; and ethyl lactate (g/L) not less than 0.40.

**3.3 Difference between Xiangshan Spirit and other rice-flavor type spirits** Common rice-flavor type spirits take rice

as raw material, uses black head mold as fermenting agent, and produces soft fragrant formed mainly by ethyl lactate, ethyl acetate and  $\beta$ -phenylethanol. Sensory features: mellow, soft, sweet, and enjoying endless after taste.

Xiangshan Spirit adopts high quality rice produced from Quanzhou as raw material. It uses white head mold particle yeast as sacchariferous and fermentative agent. Its fusel oil content is low, while acid ester content is higher than other rice flavor type spirits. Xiangshan Spirit has soft and clear fragrance mainly produced from ethyl lactate, ethyl acetate and  $\beta$ -phenylethanol. The spirit liquor is colorless, clear and transparent. With pure rice flavor and soft and sweet taste, Xiangshan Spirit may intoxicate us, but keep us sober-minded.

## 4 Thinking on supervision of Xiangshan Spirit industry

**4.1 Problems influencing quality and industrial development of Xiangshan Spirit** At the beginning of liberation, annual output of Xiangshan Spirit is about 60 t, but annual output value is only 35 900 yuan. With over five decades of development, especially after GI product protection, Xiangshan Spirit has now developed to be one of the most salable spirits in Guangxi Province with annual output up to 15 000 tons and sales income over 100 million yuan, and profit and tax over 25 million yuan. Apart from sold in China's mainland, Xiangshan Spirit is also exported to Hong Kong, Macao, and South Asian countries and regions. Quanzhou County is a large agricultural county and has always been called "Granary of Northern Guangxi". The development of Xiangshan Spirit industry is providing a new way to increase local agricultural income. Maintenance of core of Xiangshan Spirit industry relies on maintenance of its unique quality and protection of GI product. Xiangshan Spirit becoming GI protection product firstly gives credit to its unique quality, which is closely connected with unique climate and soil and other natural factors of Quanzhou. Becoming GI protection product not only provides legal weapon for its property protection, but also provides a regional industrial brand platform for its resource concentration.

However, in the development of Xiangshan Spirit industry, following quality-related problems may exist and influence main-

tenance of its unique quality and protection of GI property, consequently affect healthy development of the industry. Xiangshan Spirit adopts high quality rice produced in Quanzhou as raw material, but residues of pesticides widely used in rice may affect hygienic index. Water for making Xiangshan Spirit takes water from source regions of Xiangjiang River, so it will be influenced by quality of ecological environment in source region of Xiangjiang River. Wine making is popular in Quanzhou, but it is still unknown for whether exclusive utilization of Xiangshan Spirit GI product promotes or restricts development of Xiangshan Spirit industry.

**4.2 Suggestions on supervision of Xiangshan Spirit industry** To guarantee unique quality of Xiangshan Spirit industry at the same time of its further development and protect collective property of GI product, we suggest taking measures and establishing system to supervise the industry. Firstly, it is proposed to formulate and implement local standard *GI Product Xiangshan Spirit* on the basis of quality and technical requirements. Secondly, it is required to strengthen quality control over raw material rice, promote "enterprise + base" industrial mode, and control utilization of pesticides and improve safety of raw material from the source. Thirdly, we should rely on guidance of government, support group enterprises, encourage group enterprises to merge small private liquor factories, integrate product quality and standardize utilization of GI in the form of group, and speed up collection of such resources as funds, technologies, personnel and brand of Xiangshan Spirit. Fourthly, it is recommended to set up independent government supervisory authority, strengthen and perfect supervision function of Xiangshan Spirit industry.

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