Development Countermeasures of County-level Edible Fungi Industry in Hebei Province from the Perspective of Rural Revitalization

Kun TANG[1,2], Ying WANG[1,2], Minhui ZHANG[1,2], Wenjie CHEN[1,2], Junhong HU[3], Chunyan XIE[1,2]*

1. College of Life Science, Langfang Normal University, Langfang 065000, China; 2. Technology Innovation Center for Utilization of Edible and Medicinal Fungi in Hebei Province, Langfang 065000, China; 3. The Third Middle School of Zaoqiang County, Hengshui 053100, China

Abstract In recent years, the edible fungi industry in Hebei Province has developed rapidly, with gradually increased cultivation scale and production output, and has become the pillar industry of the province, playing a certain role in promoting the development of rural economy and rural revitalization. Based on the in-depth analysis of the development status, future development direction and current constraints of the edible fungi industry in each typical county of Hebei Province in recent years, the paper puts forward corresponding development countermeasures, which has certain reference value for the county-level edible fungi industry of Hebei Province to promote rural revitalization.

Key words Hebei, Edible fungi industry, Rural revitalization, Current status analysis

1 Introduction

With the continuous improvement in agricultural industrial structure and the continuous advancement in new rural construction, the production areas of edible fungi in China have gradually expanded to the north. After years of development, the edible fungi industry in Hebei Province has played an important role in promoting county-level industry intensification, providing employment, enhancing county-level economy, promoting agricultural and rural economic development in Hebei Province, and increasing farmers' income. It has become a pillar industry in the development of county-level agricultural economy in Hebei Province, playing a great strategic significance in promoting agriculture and rural economy in Hebei Province and accelerating rural revitalization[1-4]. On the basis of investigation and research, we analyze the development status, development direction and constraint factors of edible fungi industry in each typical county of Hebei Province, and put forward corresponding development countermeasures. This study has certain reference value for promoting the healthy development of edible fungi industry in Hebei Province.

2 Development status of county-level edible fungi industry in Hebei Province

Hebei Province is a big production and marketing province of edible fungi, and it is also one of the few provinces that can produce edible fungi in summer. In recent years, the development of edible fungi industry in Hebei Province has begun to take shape, and shows a steady growth trend. In 2021, the total production of edible fungi in Hebei Province was 1.8 million t and the total output value was 17.5 billion yuan, ranking fifth in China (Henan, Fujian, Shandong and Heilongjiang provinces). In 2022, the annual output of edible fungi in Hebei Province ranked among the top 3 in China, with 15 factories producing 100 000 mushroom-sticks per day and 20 newly built processing lines. The products are widely sold to more than 60 large and medium-sized cities in China and exported to more than 20 countries, with an annual export value of more than 80 million USD. The annual output value of 19 counties, including Pingquan City, Xinglong County, Fuping County, Linxi County and Ningjin County, exceeds 100 million yuan. There are more than 200 varieties of edible fungi cultivated in Hebei Province, among which the output of chestnut mushrooms and white king oyster mushrooms (*Pleurotus nebrodensis*) rank first in the country, and those of shiitake mushrooms (*Lentinula edodes*) and oyster mushrooms (*Pleurotus ostreatus*) rank second and third, respectively.

The edible fungi producing areas in Hebei Province are mainly concentrated in Taihang Mountain, Yanshan area, which can be divided into three producing areas, namely, Bashang off-season edible fungi producing area, rare edible fungi producing area around Beijing and Tianjin, and annual edible fungi producing area in central and southern Hebei Province. In addition, Hebei has built several influential edible fungi bases, including the world's largest chestnut mushroom production base (Qianxi County), the country's first-class factory edible fungi production base (Taihang Mountain, Yanshan area), the country's largest Yuexia shiitake mushroom production base (Taihang Mountain, Yanshan area),

Received: August 10, 2023 Accepted: October 30, 2023
Supported by Edible Fungi Preservation and Processing Innovation Team of Agricultural Industry Research System of Hebei Province (HBCT2023090208); Doctoral Research Start-up Project of University-level Research Fund of Langfang Normal University (XBQ202032).
Kun TANG, PhD., associate professor, research fields: development of functional food with edible and medicinal fungi.
* Corresponding author. Chunyan XIE, PhD., professor, research fields: food science and edible fungi processing.

the country's best benefit morel production base (Ningjin County), as well as three strain research and development centers of Pingquan shiitake mushroom, Chengde black fungus and Linxi rare edible fungi[5-6]. In order to better understand the development of the industry, several counties (cities) with outstanding development of edible fungi industry are introduced as follows.

2.1 Fuping County Fuping County belongs to Baoding City. The edible fungi industry in Fuping County, Baoding City, Hebei Province, has developed rapidly, covering 61 administrative villages in 11 townships. There are 10 new leading enterprise mushroom stick production and fresh mushroom processing and sales base, 52 new fresh-keeping storehouses with a storage capacity of more than 5 000 t, 44 edible fungi parks of more than 6.67 ha, 3 100 new mushroom sheds, and more than 40 million sticks of shiitake mushroom, oyster mushroom (*Pleurotus geesteranus*), tea tree mushrooms (*Agrocybe cylindracea*), hairy jew ear (*Auricularia polytricha*) and black fungus (*Auricularia auricula*). There are more than 33.4 million sticks of shiitake mushrooms, driving over 4 260 households. Therefore, edible fungi is the leading industry in the featured poverty alleviation industry in the county, and it is also the fastest and best developing industry, creating the "Fuping speed" and "Fuping model", which has been affirmed and praised by relevant ministries and commissions of the state and the provincial committee and government[7]. Up to now, the total planting area of edible fungi in Fuping County has reached 1 400 ha, with 102 large-scale parks, more than 4 600 edible fungi sheds, more than 80 million cultivated mushroom sticks annually, an output of about 60 000 t, and a comprehensive output value of more than 900 million yuan[8-9].

2.2 Pingquan City Pingquan City belongs to Chengde City, with a shiitake mushroom planting history of 40 years. Pingquan is the northern off-season shiitake mushroom planting base city, with a shiitake mushroom planting scale of 350 million bags, an output of 330 000 t and an output value of 3.4 billion yuan, becoming the largest off-season shiitake mushroom production base in China. "Pingquan shiitake mushroom" has obtained the registration of national agricultural products geographical indication by the Ministry of Agriculture, was rated as the ecological origin protection product by the General Administration of Quality Supervision, Inspection and Quarantine and approved as the national geographical indication certification trademark by the State Trademark Office, and has been approved as the national export edible fungus quality and safety demonstration zone for 7 consecutive years, being a regional public brand product in Hebei Province[10-11].

2.3 Ningjin County Ningjin County belongs to Xingtai City, and morel cultivation is the key agricultural industry of the county. In 2016, rare morels were successfully planted, which created the first morel cultivation in central and southern North China and filled the technical gap of morel cultivation in the north. Ningjin County is also the most concentrated area of little black oyster mushroom cultivation in China[12]. The county has 8 townships engaged in the production of edible fungi, and 32 edible fungi processing enterprises, 5 of which are national leading enterprises. There are 18 park areas over 6.67 ha, covering an area of 800 ha, with an output of more than 80 000 t and an output value of over 1.2 billion yuan. The products are sold well in many places throughout the country, and exported to Europe, the United States, Japan, South Korea and other countries and regions[13-14].

2.4 Zunhua City Zunhua City is located at the southern foot of Yanshan Mountain in Hebei Province, affiliated to Tangshan City, and it is one of the most important edible fungi production bases in northern China. Zunhua shiitake mushroom rose in 1994, and now there are 36 shiitake mushroom planting professional villages in 39 villages and 7 100 edible fungi greenhouses in the town, accounting for half of the Zunhua shiitake mushroom industry. At present, Zunhua City has the planting scale of 300 million sticks of shiitake mushroom, with an annual output of 300 000 t and an annual output value of 2.5 billion yuan, and has gradually formed a pattern of "shiitake mushroom oriented and multi-fungi development", realizing large-scale, intensive and standardized development[15-17].

2.5 Qianxi County Qianxi County is affiliated to Tangshan City, belonging to the Bohai Sea economic circle, and enjoys the reputation of "the town of chestnut mushrooms in China". Chestnut mushroom is an edible and medicinal fungus, rich in protein, amino acid, iron, zinc and other trace elements, and has high nutritional health and medicinal value. At present, chestnut mushroom industry is identified as one of the characteristic agricultural industries in Qianxi County. After nearly 20 years of development, Qianxi County was awarded the title of "the town of chestnut mushrooms in China" by China Edible Fungi Association in 2013; in 2015, the trademark "Qianxi Chestnut Mushroom" obtained the registration certificate of the State Administration for Industry and Commerce, and "Qianxi Chestnut Mushroom" was awarded the "most valuable investment brand" by the China Edible Fungi Association[18-19].

3 Development direction of edible fungi industry in Hebei Province

According to the *Plan for Promoting Advantageous Edible Fungi Industry Cluster in Hebei Province in 2022* issued by the Hebei Provincial Department of Agriculture and Rural Affairs, the edible fungi industry will develop towards industrialization, large scale, and high quality in the future[20]. Specifically, the plan aims to create five high-standard edible fungi demonstration areas: Pingquan City, Fuping County, Linxi County, Ningjin County and Zunhua City, and develop "customized fungi garden" more than 666.7 ha; build three largest oversummer high-quality shiitake mushroom demonstration areas in China: Pingquan City, Chengde County, Xinglong County, *etc.*; forge a straw rotting fungi indus-

trialization demonstration zone: with Zhangbei County as the core; establish two largest demonstration areas for facility cultivation of morel: with Ningjin County and Baixiang County as the core; construct domestic first-class modern black fungus demonstration area: with Laiyuan County, Chengde County, Weichang Manchu and Mongolian Autonomous County as the key main producing areas; construct 4 modern strain research and development and breeding centers: Pingquan City, Linxi County, Zhuozhou City, Ningjin County; upgrade 10 deep processing production lines: focusing on Pingquan City, Fuping County, Zunhua City and Chengde County, placing extra emphasis on the research and application of modern biology and nutrition strengthening technology, and promoting the development of new food raw materials and food with homology between medicine and food; foster 5 major regional public brands of edible fungi: "Pingquan shiitake mushroom", "Fuping shiitake mushroom", "Zunhua shiitake mushroom", "Qianxi chestnut mushroom" and "Ningjin morel mushroom"; breed 8 edible mushroom enterprise brands: "Senyuan", "Puheyuan", "Jingmei", "Gufangyuan", "Laoxianggu", "Shengjishun", "Jiufeng" and "Guoxu".

4 Constraints on the development of county-level edible fungi industry in Hebei Province[21-23]

4.1 Edible fungi varieties: relatively simple edible fungi varieties, insufficient scale of rare varieties, and few independent research and development varieties First of all, the two major varieties, oyster mushroom and shiitake mushroom, are mainly cultivated by edible fungi enterprises in Hebei Province, with simple edible fungi varieties and insufficient scale of rare varieties, and the phenomenon of "only samples without products" occurs from time to time. For example, the edible fungi planting varieties in Chengde are relatively single, and most of them are conventional fungi, such as shiitake mushroom, button mushroom (*Agaricus bisporus*), oyster mushroom, black fungus, *etc.*, accounting for 99% of the total production of edible fungi; there are little rare fungi, even less than 1%[24]. Secondly, China is the main producing country of shiitake mushroom, with huge demand for seed quantity, and variety selection and breeding is in the basic core position of shiitake mushroom industry. However, most of the existing main varieties are imported from abroad or from outside the province, and there are few independently developed varieties. The investigation, cultivation and research of edible fungi resources in the province are still in the initial stage, and the advantages of local fungi resources have not been effectively developed and utilized. If things continue this way, it is easy to lead to the homogeneity of edible fungi products, lack of competitive advantages, and limited development, which will also increase the future pressure of the province's fungi industry[25], and is a key factor restricting the development of edible fungi in Hebei Province.

4.2 Edible fungi quality: extensive production and management, co-existence of a variety of cultivation methods, and difficult to unify the quality of edible fungi At present, it is difficult to guarantee the quality of edible fungi products because of the great differences in the development degree and production mode of edible fungi in different regions of Hebei Province.

4.2.1 Extensive production and management. In the process of edible fungi cultivation, various regions or production factories rely on the personal experience of mushroom farmers for planting and management, and there are great differences in edible fungi varieties, production equipment, cultivation management mode, growth status, yield and quality, *etc.* Due to non-standard cultivation management operation of edible fungi and inaccurate time node, it is difficult to control mushroom emergence time and mushroom quality.

4.2.2 Backward production and quality control equipment, and lack of technical support. There are great differences in the equipments used by edible fungi production enterprises in various regions. General enterprises also lack relevant testing equipment, research and development funds, and the corresponding technical force, and it is difficult to control the quality of edible fungi production, resulting in unfulfillment of quality monitoring and quality control of edible fungi products.

4.2.3 Lack of relevant standard system or unified indicators. The production of edible fungi in Hebei Province presents a business model of regional dispersion and extensive management. There are problems such as lack of standard systems or inconsistent indicators in terms of quality standards of edible fungi, product quality standards, production process specifications, processing, storage and transportation technical regulations and safety standards, *etc.*, which makes it difficult to achieve full coverage of all elements of the whole industrial chain. It is difficult to implement the existing standards[26] and form a standardized and unified production of edible fungi, which result in unstable production, quality and safety of edible fungi, and can not well resist natural risks and market risks to the food safety and production of edible fungi industry.

4.3 Edible fungi industry: short industrial chain, and lack of fresh products deep processing enterprises In the development of edible fungi industry in Hebei Province, most of the fresh mushrooms supply the market, while the consumption market of high-end fresh products is relatively small, accounting for only about 10% of the total. There are fewer dried goods, especially the deep-processed high value-added products, and the value of nutrition, health care and other aspects has not been fully explored. With the growing maturity of cultivation scale in various regions, the yield of edible fungi increases year by year, and the market becomes more and more saturated, so the bulk edible fungi commodities in Hebei will face the risk of pricing reshuffle. Therefore, short edible fungi industry chain in Hebei and lack of intensive processing enterprises for fresh products

will limit the upgrading of the industry. With the trend of increasing consumer demand, the industry is faced with greater market risks[27].

4.4 Edible fungi technology: lack of professional and technical personnel of edible fungi, and lack of scientific and technological support for industrial development At present, the technical level and technological innovation degree related to the edible fungi industry in Hebei Province are difficult to meet the needs of the development of edible fungi industry in the province. First, there is a lack of edible fungi professional and technical personnel, especially the lack of high, fine and advanced technical personnel who are well versed in the development of edible fungi industry and have systematic theoretical knowledge and excellent practical experience. The lack of talents will affect the scientific and technological competitiveness of Hebei edible fungi industry in the national edible fungi industry. Second, there is a lack of science and technology support, and a support for edible fungi technology innovation related projects. There are less investment in research and development of new varieties, technologies, processes and standards, and there is a lack of industrial technology promotion and transformation of scientific and technological achievements. Third, fixed indicators such as annual output, development scale, output value, and profit are mostly compared to measure the development status of edible fungi industry in Hebei Province, while soft power such as technical personnel, innovative varieties, new technologies, patents, and papers are less compared.

4.5 Edible fungi promotion and sales: insufficient brand promotion, and simple marketing model As an important part of agriculture, edible fungi play an important role in promoting rural revitalization and developing local industries. However, compared with other provinces, Hebei still faces many difficulties in promotion and sales of edible fungi. For example, the public is relatively unfamiliar with the brand consumption awareness of "Pingquan shiitake mushroom", "Qianxi chestnut mushroom" and "Ningjin morel mushroom". Therefore, there is still much room for improvement in the promotion of brand and the transformation or upgrading of marketing model.

5 Suggestions on the development of county-level edible fungi industry in Hebei Province[4,28]

5.1 Edible fungi varieties: accelerating the development of independent new varieties, and optimizing the variety structure First of all, the seed is the foundation to develop breeding industry, so it is necessary to strengthen scientific and technological research and development efforts and improve the support of breeding in scientific and technological research and development. Secondly, it is best to adhere to the principle of "highlighting characteristic varieties and developing multiple varieties" in the fungi industry, and pay attention to the establishment of industrial comprehensive benefit systems of rare mushrooms (chestnut mushrooms, *Ophiocordyceps sinensis*, nameko mushrooms) in northern Hebei Province and rare mushrooms (*Coprinus comatus*, *Pleurotus geesteranus*, *Pleurotus cornucopiae*) in southern Hebei Province. It is targeted at the middle and high-end population in the Beijing – Tianjin – Hebei region, and it is planned and targeted to vigorously develop rare fungi in order to optimize and improve the industrial variety structure[29].

5.2 Edible fungi quality: optimizing product quality, and establishing and improving the standard system In order to realize the standardization, scale and intensive development of edible fungi industry in Hebei Province, it is particularly important to expand the brand effect, constantly optimize product quality, and establish and improve the supporting standard system. Therefore, only by grasping the key nodes of fungi culture, cultivation technology, storage technology, transportation and logistics, quality testing, and production safety, building and improving the standard system, promoting standardized and standardized production technology, improving the product quality and safety traceability system, improving product quality archive management, and effectively protecting the quality and safety of edible fungi products, can make consumers eat mushrooms at ease, thus making the development pace of Hebei edible fungi industry become more stable and farther.

5.3 Edible fungi industry: extending or improving the industrial chain, and promoting the development of deeply processed products Based on technological innovation, a research team can be formed relying on the industrial system, so as to accelerate the research and development of high-value-added products for deep processing. For example, research is carried out in the fields of prepared edible fungi, dried edible fungi application, edible fungi functional food, edible fungi pure extract, and edible fungi health products, in order to extend or improve the industrial chain, enhance the added value of edible fungi, and promote the continuous upgrading and sustainable development of the industry.

5.4 Edible fungi technology: cultivating professional and technical personnel of edible fungi, and supporting industry with science and technology Hebei Province should attach importance to the development of scientific research system, and intensify research on key technologies in response to major technological bottlenecks that restrict industrial development. In terms of strain purification and rejuvenation, new variety breeding, cultivation technology innovation and integration, disease and pest control, deep processing and other technologies, Hebei Province should cooperate with colleges and universities to jointly tackle key problems. In such way, Hebei Province can train a group of edible fungi professional and technical personnel, and also promote scientific and technological innovation and achievement transformation, thereby supporting the sustainable development of the industry with scientific and technological strength. Edible fungi enterprises are encouraged to introduce professional and high-level technical personnel, and local professionals are encouraged to ex-

change and further study in other well-known edible fungi production and research institutions, so as to improve the level of local professionals. The exchanges with other edible fungus institutions should be strengthened, and domestic and foreign edible fungus experts can be invited to teach in the province.

5.5 Edible fungi promotion and sales: creating and publicizing well-known brands, and building a three-dimensional marketing environment Through research and analysis, it is found that consumers' attention to brand when choosing edible fungi products will increase with the increase of per capita household income. Therefore, it is necessary to build and publicize the regional brand of Hebei edible fungi, as well as the enterprise brand of Hebei edible fungi. It is suggested to make efforts from the innovation of packaging graphics, the positioning of local characteristic products, the support of government policies, and the investment of funds to the convergence of marketing manpower. A three-dimensional online and offline cross marketing approach can be established, that is, increasing the publicity of "fine" planting and "intelligent" management process of edible fungi offline, and strengthening the accurate dissemination of information about "therapeutic value" and "therapeutic method" of edible fungi. Meantime, offline experience stores can be set up to expand the audience's knowledge and understanding of edible fungi; diversified internet channels online can be constructed, to realize the customized production of deep-processed products, or the customized service of edible fungi products; traditional B2B and B2C e-commerce can also be carried out, or O2O chain catering and retail outlets can be developed[30]. In this manner, the combination of online and offline commerce can effectively use resources and accelerate the promotion and sales of edible fungi in Hebei Province.

6 Prospects

As a dominant industry and the main poverty-alleviation industry, edible fungi in Hebei Province has a good comprehensive development level of industrial cluster[31], but there are still some problems restricting the healthy development of edible fungi industry. Therefore, it is necessary to recognize the current situation and pay attention to the existing problems, constantly search for excellent varieties suitable for different cultivation areas, and speed up the development and research of native germplasm resources. It is necessary to strengthen the training of professional and technical personnel of edible fungi and tackle problems in key technologies, and establish a standard system of the whole industrial chain including the cultivation, processing, storage and quality inspection of edible fungi. Furthermore, it is necessary to optimize the allocation of industrial resources, enrich sales channels, improve the competitive advantage of the county-level edible fungi industry, and realize the diversification, standardization and science and technology of the edible fungi industry, thus giving full play to the resource advantages and edible fungi industry base and promoting the development of Hebei edible fungi industry cluster to a healthy and rapid road.

References

[1] WANG L. Research on the relationship between edible fungi characteristic agriculture and county economic growth based on value model[J]. Edible Fungi of China, 2020, 39(8): 92-94. (in Chinese).

[2] JI XY. SWOT analysis on the development of edible fungi industry in Hebei Province[J]. Co-Operative Economy & Science, 2015, 505(2): 20-22. (in Chinese).

[3] BAI L, ZHANG RQ, ZHAO BH. Current situation and development countermeasures of edible mushroom industry in Hebei Province[J]. Edible and Medicinal Mushrooms, 2015, 23(3): 174-178. (in Chinese).

[4] ZHANG YM. Development status and countermeasures of edible fungi industry in Hebei Province[J]. Jiangxi Agriculture, 2017, 113(11): 85. (in Chinese).

[5] ZHAO Q, NIE CH, MA LG, *et al.* Development of edible fungi industry in Hebei Province and its year-end target[J]. Hebei Agriculture, 2022, 331(10): 16. (in Chinese).

[6] YANG XJ, YANG SL, MENG XF. Research on the development of edible fungi industry in Hebei Province[J]. Agricultural Engineering Technology, 2022, 42(2): 22, 26. (in Chinese).

[7] LIU FQ, HUA F, ZHAO XL. Leading the innovation and development of edible fungi industry in Fuping County with the construction of the park [J]. Agricultural Engineering Technology, 2021, 41(12): 37-39. (in Chinese).

[8] KOU GR, LI XQ. With the help of science and technology, small mushrooms hold up the "getting rich umbrella"[N]. Hebei Daily, 2021-12-06 (002). (in Chinese).

[9] SUN JH, LI BW. Development status of edible fungi industry in Baoding City and the path of increasing efficiency[J]. Modern Agricultural Science and Technology, 2023, 618(2): 13-14. (in Chinese).

[10] WANG XQ, GUO XY, YU SQ, *et al.* SWOT analysis and countermeasures for the development of mushroom industry in Pingquan[J]. Science and Technology of Tianjin Agriculture and Forestry, 2022, 287(3): 33-37. (in Chinese).

[11] ZHANG YQ, SUN SX, DING YZ, *et al.* On tourism development of the preponderant characteristic industry of edible fungus in Pingquan City [J]. Journal of Sichuan Tourism University, 2023, 165(2): 41-45, 75. (in Chinese).

[12] TIAN L. Ningjin Shengjishun edible fungus planting professional cooperative: small morels gave birth to a big industry[J]. Hebei Agriculture, 2022, 322(1): 45-46. (in Chinese).

[13] GANG AS. Development status of edible fungi industry in Ningjin County, Xingtai City[J]. China Agricultural Information, 2016, 192(18): 144-145. (in Chinese).

[14] ZHANG YZ, YANG SL, LI XJ, *et al.* Current situation, problems and development suggestions of edible fungi industry in Xingtai, Hebei Province[J]. Agricultural Engineering Technology, 2022, 42(23): 7, 9. (in Chinese).

[15] LIU ZQ. Development suggestions on edible fungi industry in Hebei Province: Embracing the big food industry to develop diversified edible fungi products[J]. Hebei Agriculture, 2020, 300(3): 36-37. (in Chinese).

[16] LIU SY. Study on brand construction of *Lentinus edodes* industry in Hebei Province[D]. Baoding: Hebei Agricultural University, 2019. (in Chinese).

[17] REN SY. High yield secret of *Lentinus edodes* in Zunhua City[J]. Modern Agricultural Science and Technology, 2012, 427(3): 18-19. (in Chinese).

(To page 23)

lenges; the business principle of being polite, honest, and trustworthy; the inclusive spirit of coexistence and mutual benefit cooperation; and the platform concept of continuously deepening regional cooperation in economy, trade, culture, and tourism, driving innovation and cultural exchange. By introducing tea culture into the promotion of border tea, it can guide people of all ethnic groups to form correct ideological concepts and achieve the goal of humanistic literacy education. The integration of tea culture into the humanistic literacy education of various ethnic groups has enhanced cultural confidence, laid the foundation for cultivating high-quality talents with comprehensive development of morality, intelligence, physical fitness, aesthetics, and labor, and promoted the exchange, communication and integration of various ethnic groups in the Tea Road of Ten Thousand Miles.

References

[1] LI YQ, ZHANG L. On the construction of ecological community of Chinese nation: Theoretical origin, basic connotation and value implication [J]. Qinghai Social Sciences, 2022(1): 41 – 49. (in Chinese).

[2] YAN SQ, XING BN. On conceptualization and consciousness cultivation of Chinese national community [J]. Gansu Social Sciences, 2022(4): 16 – 25. (in Chinese).

[3] XU XD. The history, problems and ways of creating a strong sense of community for the Chinese nation [J]. Journal of Huazhong University of Science and Technology (Social Science Edition), 2021, 35(3): 135 – 140. (in Chinese).

[4] MENG FD, TIAN Y, MENG CQ. The multiple attributes and scientific connotation of the Chinese nation community [J]. Journal of Jiangsu University: Social Science Edition, 2022, 24(4): 8 – 22. (in Chinese).

[5] ZHANG SG, WANG LX. From historical generation to the value of the times: The multiple implications of consolidating the sense of community for the Chinese nation [J]. Journal of Beijing Administration Institute, 2022(3): 1 – 9. (in Chinese).

[6] WANG HX, HONG XH. Strengthening a strong sense of community for the Chinese nation and build a beautiful, happy and new Tibet [J]. Journal of Tibet University, 2022, 37(1): 158 – 164. (in Chinese).

[7] ZHANG MJ, LI YX. The villages in ethnic areas forging the consciousness of Chinese national community realization path: Based on the case analysis of Muzhai Village in Guangxi [J]. Journal of North Minzu University (Philosophy and Social Science), 2022(2): 65 – 71. (in Chinese).

[8] ZHANG Y, YU PX. Development of tourism in western China and the establishment of the Chinese national community consciousness [J]. Journal of South – Central University for Nationalities (Humanities and Social Sciences), 2022, 42(2): 37 – 44. (in Chinese).

[9] LUO CJ. Thoughts on ways of consolidating community consciousness of the Chinese nation and building Minzu unity and promoting progress: Based on the fieldwork in Chenshuang Village in Huanjiang Maonan Autonomous County [J]. Journal of Guangxi University For Nationalites: Philosophy and Social Science Edition, 2021, 43(5): 132 – 137. (in Chinese).

(From page 19)

[18] YIN YF, LI M, LI SM. Development status and countermeasures of chestnut mushroom industry in Qianxi County [J]. Modern Agricultural Science and Technology, 2023, 831(1): 204 – 207. (in Chinese).

[19] MOU Y. Small chestnut mushroom, large industry [J]. Agricultural Products Market, 2020, 943(13): 4 – 5. (in Chinese).

[20] Hebei Provincial Department of Agriculture and Rural Affairs. Hebei: By the end of 2022, five high-standard edible fungi demonstration zones will be built [J]. China Food, 2022, 842(10): 36 – 37. (in Chinese).

[21] MA Y, GUO YJ. Research on the development of edible fungi industry in Hebei Province: An analysis based on SWOT model [J]. Rural Economy and Science-Technology, 2021, 32(14): 172 – 174. (in Chinese).

[22] BAI L, LI ZM, LIN ZH. Study on problems and strategy of mushrooms parks in Hebei Province [J]. Journal of Hebei University of Economics and Business (Comprehensive Edition), 2016, 16(1): 82 – 85. (in Chinese).

[23] WANG Z, ZHAO BH. Current situation of edible fungus industry development in Hebei Province and countermeasures [J]. Chinese Journal of Agricultural Resources and Regional Planning, 2015, 36(1): 128 – 132. (in Chinese).

[24] YIN YM. Development status and countermeasures of edible fungi industry in Chengde County [J]. Rural Science and Technology, 2020 (3): 66 – 67. (in Chinese).

[25] WANG XQ, GUO XY, YU SQ, *et al.* SWOT analysis and countermeasures for the development of mushroom industry in Pingquan [J]. Science and Technology of Tianjin Agriculture and Forestry, 2022, 287(3): 33 – 37. (in Chinese).

[26] TAI LM, DONG J, ZHANG L, *et al.* Analysis on the development status of *Lentinus edodes* industry and standardization in China [J]. Edible Fungi of China, 2020, 39(5): 8 – 16. (in Chinese).

[27] HE GQ, WEI JK, HU XY, *et al.* Present situation and prospect of edible fungi industry development in China [J]. Vegetables, 2022, 376(4): 40 – 46. (in Chinese).

[28] DONG Q, LI ZY, DIAO G, *et al.* Development status and countermeasures of edible fungi industry in poverty-stricken counties around the capital of Hebei Province from the perspective of poverty alleviation [J]. Contemporary Economics, 2017, 459(27): 84 – 85. (in Chinese).

[29] LI L. Study on comprehensive benefit evaluation of rare edible fungi industry in Hebei Province [D]. Baoding: Hebei Agricultural University, 2021. (in Chinese).

[30] LIU WL, LI CY, HUANG XJ, *et al.* Research on marketing strategy of edible fungi in Jilin Province under the environment of financial media [J]. Modern Business, 2023, 665(4): 46 – 49. (in Chinese).

[31] LI B, LU YH, ZHANG RQ, *et al.* Evaluation on the development level of edible fungus industry cluster in Hebei Province [J]. Northern Horticulture, 2023, 523(4): 145 – 152. (in Chinese).