Exploration on Medication Laws of Irritable Bowel Syndrome in a Traditional Chinese Medicine Hospital Based on Prescription Analysis

Mei LI, Chaofen YANG, Si JIA, Zhihui CHEN, Qiuyan WU, Ping XIA*

Department of Pharmacy, Guanling Autonomous County Hospital of Traditional Chinese Medicine, Anshun 561300, China

Abstract [**Objectives**] This study was conducted to analyze the medication laws of traditional Chinese medicine prescriptions for the treatment of spleen-deficiency irritable bowel syndrome in Guanling Autonomous County Hospital of Traditional Chinese Medicine. [**Methods**] Prescriptions for the treatment of spleen-deficiency irritable bowel syndrome (IBS) were retrieved from the TCM family of the hospital, traditional Chinese medical doctor Wu Zhongli, in the period from November 2023 to April 2024. Microsoft Excel 2007 was employed to set up an information table of TCM prescriptions, and the age, gender, herbal properties, efficacy categories and the frequency of use were analyzed to explore the medication laws of TCM in the hospital for the treatment of spleen-deficiency irritable bowel syndrome. [**Results**] Among the 259 TCM prescriptions included, 152 kinds of TCM decoction pieces were used. The decoction pieces were mainly warm in nature, and decoction pieces cold in nature took the second place. The flavors of the herbs were mostly sweet, bitter and pungent. Most of them were attributive to the spleen, stomach meridian and lung meridians, and the herbs were mainly used for tonifying deficiency and regulating qi. The herbs with higher frequency of use included Radix Glycyrrhiza, Pericarpium Citri Reticulatae, poria, and Angelicae Sinensis Radix, the main effects of which are replenishing qi to invigorate the spleen, activating qi and eliminating phlegm, clearing damp and promoting diuresis, and relaxing bowel. [**Conclusions**] Chinese medicine treatment of IBS with spleen deficiency in hospitals is mainly based on replenishing qi to invigorate the spleen, activating qi and eliminating phlegm, clearing damp and promoting diuresis, and relaxing bowel, and Xiangsha Liujunzi Decoction is commonly used in clinical treatment based on syndrome differentiation with modifications.

Key words Prescription analysis; Irritable bowel syndrome; Traditional Chinese medicine; Medication law

DOI:10.19759/j.cnki.2164-4993.2025.01.011

Irritable bowel syndrome (IBS) is a common functional bowel disease, characterized by abdominal pain, diarrhea, constipation, changes in defecation habits, and fecal abnormalities. There is a lack of morphological and biochemical abnormalities to explain the symptoms. This disease is the most common functional intestinal disease, which is common in clinic and difficult to cure, seriously affecting people's normal life, and about 14% of the world's population is affected by this disease[1]. According to defecation habits, it can be divided into constipation type (IBS-C), diarrhea type (IBS-D), mixed type (IBS-M) and undetermined type (IBS-U)[2]. Among them, IBS-D is the most common, with high incidence and easy recurrence. Among the TCM diagnosis names, the TCM diagnosis names of IBS are diarrhea, constipation and abdominal pain according to the current main symptoms. IBS-D belongs to the category of "spleen deficiency" and "diarrhea". It is divided into four syndromes, among which the first is the syndrome of liver-qi attacking spleen, with the symptoms of diarrhea following abdominal pain which is relieved after diarrhea. The second is the syndrome of insufficiency of the spleen with overabundance of dampness, showing the symptom of diarrhea after meals and fear of cold diet. The third is the syndrome of spleen and kidney yang deficiency, with the symptoms of diarrhea at dawn, and abdominal cold pain which can be relieved with warm treatment. The last is the syndrome of dampness and heat in the large intestine, with the symptoms of abdominal discomfort, thirst without the desire for water, dry mouth and sticky mouth, anus burning, and diarrhea following abdominal pain[3]. In recent years, the treatment of IBS by traditional Chinese medicine has shown good curative effect and prospect. Dr. Wu Zhongli has been engaged in clinical diagnosis and treatment in Guanling Autonomous County for more than 50 years. He is good at treating intractable diseases in the Department of Internal Medicine with classic prescriptions of traditional Chinese medicine, and has unique views on the application of prescriptions in traditional Chinese medicine, which has a good therapeutic effect on intractable diseases in internal medicine. He has been committed to treating digestive tract diseases with traditional Chinese medicine in the Department of Gastroenterology of the hospital for many years and achieved certain results in clinic. In this study, data mining analysis techniques were applied to study the basic medication laws of traditional Chinese medicine in the treatment of IBS with spleen deficiency in the hospital, aiming to provide reference for clinical treatment of this disease and the next step of hospital preparation research and development.

Received: October 3, 2024 Accepted: December 9, 2024

Mei LI (1990 -), female, P. R. China, pharmacist-in-charge, devoted to research about hospital pharmacy management and prescription dispensing.

* Corresponding author. E-mail: 358339694@qq.com.

Materials and Methods

Prescription source

From November 2023 to April 2024, the prescriptions for IBS

patients with spleen diseases who were treated in Wu Zhongli expert clinic of Guanling Autonomous County Hospital of Traditional Chinese Medicine were selected.

Inclusion criteria

(i) Conforming the Rome III[4-5] IBS diagnostic criteria and the diagnostic criteria of spleen deficiency syndrome[6] in traditional Chinese medicine; (ii) taking Chinese medicine all the time; (iii) at least one follow-up visit, showing improved symptoms after treatment; (iv) complete and reliable clinical data.

Exclusion criteria

(i) Previous gastrointestinal tumors or other organic lesions; (ii) complicated diseases of heart, liver, lung and other organs; (iii) mental disorders. According to the gender, age, the number of traditional Chinese medicines, names of traditional Chinese medicines and the frequency of use, statistical analysis was made by EXCEL.

Research methods

The data including patients' names, genders and ages, herbs in prescriptions, number of herbs, total dosage, commonly used herbs, their commonly used dosage ranges, frequency of TCM decoction pieces, and their efficacy categories were input into Excel 2007 to establish a TCM prescription information table. With the help of Excel 2007 and SPSS 23.0, data mining was carried out on patients' genders and ages, and efficacy categories, natures, flavors and meridian distribution of herbs, an efficacy category statistical map and a high-frequency medicine statistical table were drawn according to frequency distribution. The natures, flavors and meridian distribution of traditional Chinese medicines and their efficacy classification referred to *Clinical Traditional Chinese Medicine*[7].

Results and Analysis

General conditions

A total of 102 patients with irritable bowel syndrome (IBS) were included and 259 prescriptions were collected. Their ages ranged from 7 to 86 years, with an average of 50.24 years. There were 65 females (63.73%) and 37 males (36.27%). People over 40 and under 60 years old accounted for 53.92% of the total, and they were the high incidence group of IBS patients in this area. The age distribution is shown in Table 1. A total of 159 Chinese herbal pieces were used in the prescriptions, with a total frequency of 3 128 times, and 12.1 Chinese herbs were used in each prescription averagely.

Table 1 Age distribution of IBS patients

No.	Age	Number of people	Proportion in total patients//%
1	Under 20 years old	2	1.96
2	20 – 40 years old	22	21.57
3	41 – 60 years old	55	53.92
4	Over 60 years old	23	22.55

Distribution of number of medicines in prescriptions

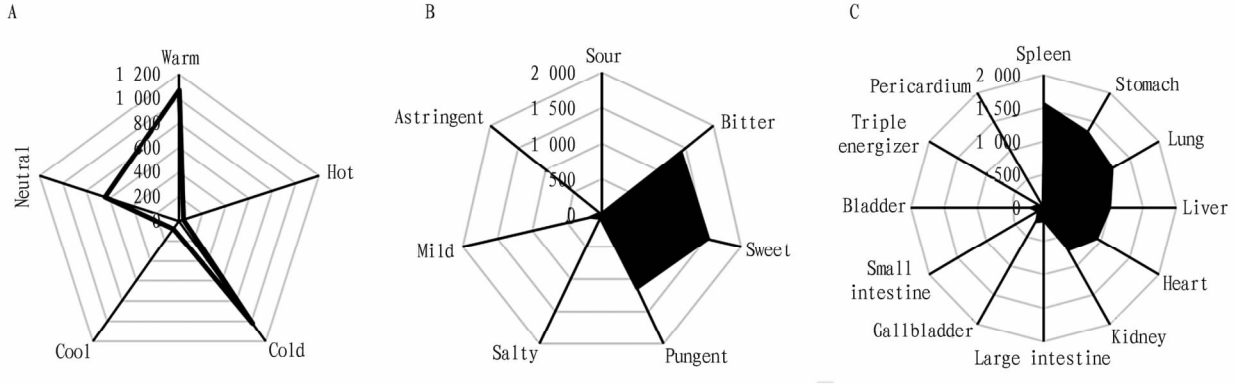
In the 259 prescriptions, the largest number of included herbs were 27, and the smallest number was 4. The average number of herbs was as high as 19. The number of herbs per dose was generally between 10 and 20, as shown in Table 2.

Table 2 Distribution of number of herbs in spleen-related disease prescriptions in Guanling Autonomous County Hospital of Traditional Chinese Medicine from November 2023 to April 2024

Number of herbs	Number of prescriptions	Proportion in total prescriptions//%
Less than 10 herbs	80	30.89
11 – 20 herbs	177	68.34
21 – 30 herbs	2	0.77

Nature, flavor and meridian distribution

Chinese herbal pieces in the prescriptions were mainly warm. Most of them were sweet, bitter and pungent. They were mainly attributed to the spleen and stomach meridians, as shown in Fig. 1.



A. Nature; B. flavor; C. meridian distribution.

Fig. 1 Nature, flavor and meridian distribution of medicines

Efficacy categories

There are 20 kinds of efficacy of traditional Chinese medicine in total. The outpatient prescriptions of Wu Zhongli's expert clinic involved 14 kinds of efficacy. Tonifying herbs were used most fre-

quently, followed by qi-regulating herbs, as shown in Fig. 2.

High-frequency herbs

Eleven kinds of traditional Chinese medicines were used more than 50 times. Among them, Radix Glycyrrhiza showed the highest frequency, followed by Pericarpium Citri Reticulatae and poria, as shown in Table 3.

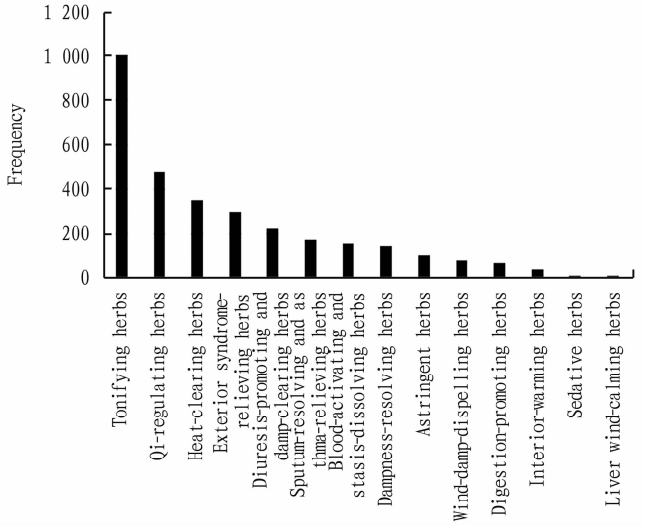


Fig. 2 Statistics of efficacy categories

Table 3 Frequency statistics of high-frequency herbs

No.	Herb	Times	Frequency//%
1	Radix Glycyrrhiza	179	69.11
2	Pericarpium Citri Reticulatae	157	60.62
3	Poria	145	55.98
4	Angelicae Sinensis Radix	142	54.83
5	Paeoniae Radix Alba	105	40.54
6	Jujubae Fructus	98	37.84
7	Rehmanniae Radix	97	37.45
8	Radix Ophiopogonis	95	36.68
9	Radix Bupleuri	78	30.12
10	Glehniae Radix	58	22.39
11	Chuanxiong Rhizoma	53	20.46

Conclusions and Discussion

Traditional Chinese medicine believes that the disease characteristics of IBS are mainly abdominal pain or abdominal discomfort with obvious changes in defecation habits. IBS-D is the most common type of IBS with a total incidence of about 15%, which has a serious impact on the quality of patients' life[8]. IBS is a common functional digestive system disease caused by multiple factors. With the change of social environment, diet structure and lifestyle and the increase of people's life pressure, the prevalence rate is on the rise[9]. The literature records that the disease is related to factors such as improper diet, congenital deficiency, acquired malnutrition and exogenous pathogenic factors. In recent years, the prevalence rate of IBS outpatients in China is about 22.4%, and the proportion of IBS-D is high, which seriously affects people's daily life and work. According to doctor Wu's experience, patients with IBS-C in Guanling Autonomous County have shown an increasing trend in recent years, so most of the Chinese herbal pieces used are added with bitter and cold herbs. IBS is a disorder of intestinal function. Its pathogenesis and mechanism are complicated and inconclusive. The treatment of IBS by western medicine includes psychotherapy, diet therapy, exercise therapy, drug therapy, *etc.* According to the mechanism of action, the commonly used drugs are divided into antispasmodic drugs, antidiarrheal drugs, laxatives, secretagogues, probiotics and nonabsorbable antibiotics in the intestine[10], but the disease tend to recur after treatment and is difficult to cure.

IBS is a common functional gastrointestinal disease, with abdominal pain or abdominal discomfort as the main symptom, which can be improved after defecation, and it is often accompanied by changes in defecation habits and stool properties. Constipation and diarrhea can appear alternately, but there are no morphological and biochemical abnormalities that can explain the symptoms. It used to be called "spastic colitis", "mucinous colitis" and "unstable colitis". Through data processing, it is known that the ratio of men to women suffering from irritable IBS in Guanling Buyi and Miao Autonomous County is about 1∶2. According to clinical data, there are five major factors of IBS: improper diet, congenital deficiency, mental stress, acquired malnutrition and psychological factors. Among them, improper diet is more common among the above factors. In terms of age distribution, for people over 40 years old, the essence and qi are gradually deficient, and the viscera are gradually damaged, so the incidence rate shows an increasing trend. Patients in the age range of 41 – 60 years old accounts for 53.92% of the total cases, equivalent to more than half. Young patients are often caused by congenital deficiency and acquired malnutrition.

The results show that the traditional Chinese medicines for treating IBS with spleen deficiency in this area are mainly warm in nature and sweet, pungent and bitter in taste. From the point of meridian distribution, they are mainly attributive to the spleen and stomach meridians, and their efficacy is mainly to tonify deficiency and promote qi. The pathogenesis of IBS with spleen deficiency is qi deficiency of spleen and stomach, which leads to dampness blockade and qi stagnation or stomach deficiency and circulation of vital energy in the wrong direction. The disease is located in the large intestine, which is closely related to the spleen, stomach, lung and liver. The spleen and stomach transport water and body fluid, which is the hub of the whole body's qi system, and its qi deficiency easily leads to the dysfunction of the whole body's qi. Meanwhile, when the deficient spleen is subjugated by the liver, the function of the liver controlling the discharge will also be affected, which will lead to liver depression generating fire and then liver fire impairing lun, which will affect the function of the lung in dispersing and descending, which will further lead to unfavorable water and liquid metabolism, stagnation of phlegm damp and retained fluid, and obstruction of middle energizer, resulting in

symptoms such as loose stool, abdominal distension and fatigue[11-12]. The treatment method should be invigorating spleen and supplementing qi, and activating qi to eliminate damp. Sweet herbs have tonifying effects, pungent herbs have the function of dispersing, and bitter herbs can eliminate damp, so the prescriptions for treating IBS with spleen deficiency should be mainly sweet, pungent and bitter herbs. This type of herbs are warm and neutral in nature, and their effects are mainly to tonify deficiency and promote qi. They work together to invigorate spleen and regulating qi, drye damp and regulate the middle warmer.

According to the analysis on the nature, flavor and meridian distribution of prescription herbs in Fig. 1, the decoction pieces in the prescriptions were mostly warm. Most of them were sweet, bitter and pungent. They were mainly attributive to the spleen and stomach meridians. From the perspective of efficacy categories, the prescriptions mainly involved 14 kinds of efficacy. Through the analysis and statistics in Fig. 2, it could be seen that the frequency of use of tonifying herbs were most frequently, followed by qi-regulating herbs, conforming to the treatment principle of IBS by traditional Chinese medicine. From the use frequency of prescription herbs, the top five kinds of decoction pieces with the highest frequency were Radix Glycyrrhiza, Pericarpium Citri Reticulatae, poria, Angelicae Sinensis Radix and Radix Paeoniae Alba. These herbs are commonly used in clinical treatment of the spleen-deficiency syndrome. Radix Glycyrrhiza is sweet and neutral, and attributive to the heart, lung, spleen and stomach meridians. It has the effects of invigorating the middle energizer, invigorating qi, moistening lung and relieving cough[13]. Modern pharmacological research shows that Radix Glycyrrhiza has anti-inflammatory, antitumor, antibacterial, antiviral, antioxidant and immunomodulatory effects, and exhibits a good therapeutic effect on cardiovascular and cerebrovascular diseases, diabetes and liver diseases[14]. Modified Gancao Xiexin Decoction can significantly treat patients with chronic colitis, reduce inflammatory reaction and speed up the improvement of clinical symptoms[15]. Therefore, Radix Glycyrrhiza is often used to treat the spleen deficiency type of IBS patients. Pericarpium Citri Reticulatae is pungent in taste and warm in nature, and enters the lung and spleen meridians. It has the effects of regulating qi-flowing for strengthening spleen, eliminating dampness and resolving phlegm. Modern pharmacological studies have found that the water extract and volatile oil of Pericarpium Citri Reticulatae can inhibit the spontaneous activity of gastrointestinal smooth muscle and antagonize the contraction spasm of intestinal smooth muscle caused by histamine[16]. It is mainly used to treat diseases of digestive system and respiratory system, and it is the most commonly used medicine for digestive tract diseases such as esophagus, gastroduodenal, *etc.* It can also be used to treat chest and hypochondriac swelling pain, hernia, nodule in breast, breast abscess, dyspepsia and abdominal pain[17]. Fu *et al.*[18] studied the digestion promoting effect of different polar fractions of Pericarpium Citri Reticulatae extract on rats, and the results showed that the multi-methoxy flavonoid nobiletin and hesperidin in Pericarpium Citri Reticulatae had strong digestion promoting activity on rats, and multi-methoxy flavonoids were the main material basis of the digestion-promoting function of Pericarpium Citri Reticulatae. Poria is neutral in nature and sweet and light in taste, and has the effects of promoting diuresis, strengthening the spleen and calming the heart. It is known that "nine of ten prescriptions include poria". Polysaccharides in poria have a wide range of pharmacological activities, such as regulating immunity and resisting inflammation and oxidation. Research data show that its anti-inflammatory effect can reduce colon mucosal injury and improve intestinal transmission disorder[19]. Angelicae Sinensis Radix is warm in nature and sweet and pungent in taste. Angelica sinensis was first recorded in *Shen Nong's Herbal Classic*, and it was listed as a medium-grade herb[20]. It has the effects of enriching blood and promoting blood circulation, regulating menstruation and relieving pain, and relaxing bowels. Angelicae Sinensis Radix is mainly used in clinic for blood deficiency and sallow, irregular menstruation, amenorrhea and dysmenorrhea, constipation due to intestinal dryness, abdominal pain due to deficiency-cold, *etc.*[21]. Modern pharmacological research shows that the functions that have been proved at present include regulating blood circulation, protecting against tissue fibrosis after ischemia, relieving pain, protecting the brain and nerves, improving the state of bone injury, and improving the immunity of the body[22]. Radix Paeoniae Alba is cold in nature and bitter and sour in taste. It has the effects of nourishing blood, regulating menstruation, retaining yin with astringent, stopping sweating, softening liver and relieving pain. Animal research data show that the intestinal injury and intestinal microbial imbalance induced by lipopolysaccharide in mice are obviously relieved after the use of Radix Paeoniae Alba, and its mechanism is to improve the composition of intestinal microbial community in mice by relieving oxidative stress and changing the abundance of some bacteria[23].

From the perspective of frequent occurrence of medicines, the analysis of core prescriptions shows that the core formula consists of Radix Glycyrrhiza, Pericarpium Citri Reticulatae, poria, Angelicae Sinensis Radix and Radix Paeoniae Alba. It is modified from the representative formula Xiangsha Liujunzi Decoction, and exerts the effects of replenishing qi to invigorate the speen, drying dampness and promoting qi circulation. In addition, because the patients with spleen diseases in this area are older and the climate is hot, fixed changes in usage and dosage can not only inherit the development of ethnic medicine, but also provide a theoretical basis for clinical drug use and preparation research and development.

References

[1] WERLANG ME, PALMER WC, LACY BE. Irritable bowel syndrome and dietary interventions[J]. Gastroenterol Hepatol (N Y), 2019, 15(1): 16-26.

[2] ZHU JJ. Exploration of IBS-D rat model with spleen-kidney yang deficiency

and study on the mechanism of Wenshen Jianpi Prescription intervening CRF signal pathway[D]. Beijing: Beijing University of Chinese Medicine, 2018. (in Chinese).
[3] WEN YD, LI BS, WANG YG, *et al.* Guidelines for the diagnosis and treatment of irritable bowel syndrome, a common disease in digestive system (grass-roots doctor edition)[J]. China Journal of Traditional Chinese Medicine and Pharmacy, 2020, 7(35): 3518-3523. (in Chinese).
[4] DROSSMAN DA, HASLER WL. Rome IV functional GI disorders; disorders of gut-brain interaction[J]. Gastroenterology, 2016, 150(6): 1257-1261.
[5] WU SY, XIA J, XU Y, *et al.* Influence of Rome IV diagnostic criteria on patients with irritable bowel syndrome[J]. Chinese Journal of Digestion, 2019, 3: 167-172. (in Chinese).
[6] Professional Committee of Digestive System Diseases of Chinese Association of the Integration of Traditional and Western Medicine. Traditional Chinese medicine symptom rating scale for gastrointestinal diseases[J]. Chinese Journal of Integrated Traditional and Western Medicine on Digestion, 2011,19(1): 66-68. (in Chinese).
[7] ZHANG TM. Clinical traditional Chinese medicine[M]. Shanghai:Shanghai Scientific and Technical Publishers, 2006. (in Chinese).
[8] WANG W. Clinical effect of Wenshen Jianpi prescription on diarrhea-type irritable bowel syndrome (IBS) (spleen-kidney yang deficiency syndrome)[J]. World Journal of Complex Medicine, 2021, 10(7): 89-92. (in Chinese).
[9] YANG B, CHEN DR. Research progress on influencing factors of irritable bowel syndrome[J]. Shandong Medical Journal, 2018, 58(9): 102-105. (in Chinese).
[10] WANG HY, ZHANG J. Western medicine treatment of irritable bowel syndrome[J]. Family Medicine, 2021, 3(15): 14-15. (in Chinese).
[11] CHEN GG, PAN YY, CUI YY, *et al.* Exploration of the medication law of Professor Wei Wei in treating diarrhea-type irritable bowel syndrome based on data[J]. China Medical Herald, 2022, 19(34): 108-112. (in Chinese).
[12] DU Y, GUO ZJ, GUO YX, *et al.* Discussion on administration rules of traditional Chinese medicine for diarrhea pre-dominant irritable bowel syndrome based on data mining[J]. Journal of New Chinese Medicine, 2023, 55(3): 17-22. (in Chinese).
[13] LI ZY, HAO EW, LI H, *et al.* Pharmacological effect of Glycyrrizae Radix et Rhizoma compatibility and its mechanism[J]. Chinese Journal of Experimental Traditional Medical Formulae, 2022, 28(14): 270-282. (in Chinese).
[14] XIAO X, LI CY, LIU XL, *et al.* Research progress of main chemical constituents and pharmacological effects of Glycyrrhizae Radix et Rhizoma[J]. Journal of Xinxiang Medical University, 2023, 3(40): 280-285. (in Chinese).
[15] DENG YH, WANG NN, ZOU ZH, *et al.* Clinical application value analysis of Gancao Xiexin Decoction in the treatment of chronic colitis [J]. Heilongjiang Journal of Traditional Chinese Medicine, 2021, 3(1): 14-15. (in Chinese).
[16] XU P. Comparison of pharmacological effects between aqueous extract of Pericarpium Citri Reticulatae and volatile oil of Pericarpium Citri Reticulatae[J]. Journal of Jiangxi University of Traditional Chinese Medicine, 1998(4): 27-28. (in Chinese).
[17] LI WW, ZHANG GW. Research progress of flavonoids in Pericarpium Citri Reticulatae[J]. Chinese Medical Innovations, 2014, 11(24): 154-156. (in Chinese).
[18] FU MQ, XIAO GS, WU JJ, *et al.* Studies on chemical basis of digestion promoting function of Pericarpium Citri Reticulatae (Citrus reticulate 'Chachi')[J]. Journal of Chinese Institute of Food Science and Technology, 2018, 18(1): 56-64. (in Chinese).
[19] CHENG Y, DING ZX, ZHANG Y, *et al.* Research progress on chemical structures and pharmacological activities of Poria cocos polysaccharide and its derivatives[J]. China Journal of Chinese Materia Medica, 2020, 45(18): 4332-4340. (in Chinese).
[20] GUO JM. Research on the herbology and pharmacognosy of medicinal Angelica sinensis[J]. China Pharmacy, 2015, 13(10): 18-19.
[21] Chinese Pharmacopoeia Commission. Chinese pharmacopoeia[M]. Beijing: China Medical Science Press, 2020. (in Chinese).
[22] MOU CY, YIN Y, SHEN ZX. Research progress on chemical components and pharmacological effects of Danggui (Angelicae Sinensis Radix)[J]. Shandong Journal of Traditional Chinese Medicine, 2024, 5(43): 544-551. (in Chinese).
[23] LI A, DING J, SHEN T, *et al.* Radix Paeoniae Alba polysaccharide attenuates lipopolysaccharide-induced intestinal injury by regulating gut microbiota[J]. Front Microbiol, 2002, 13: 1064657.

Editor: Yingzhi GUANG Proofreader: Xinxiu ZHU

(Continued from page 47)

[18] PRAJAPATI VD, JAIN GK, MORADIYA NG. Pharmaceutical applications of various gums, mucilages and their modified forms[M]. Oxford: Blackwell Science, 2003.
[19] LÓPEZ G, ROS G, RINCÓN F, *et al.* Functional properties of dietary fiber: Mechanism of actions in gastrointestinal tract[J]. Archivos Latinoamericanos de Nutricion, 1997, 47: 203-207.
[20] ZHANG N, HUANG CH, OU S. *In vitro* binding capacities of three dietary fibers and their mixture for four toxic elements, cholesterol, and bile acid[J]. Journal of Hazardous Materials, 2011, 186: 236-239.
[21] AGNIESZKA N. Binding of heavy metals to pomace fibers[J]. Food Chemistry, 2005, 90: 395-400.
[22] SANGNARK A, NOOMHORM A. Effect of particle sizes on functional properties of dietary fiber prepared from sugar canebagasse[J]. Food Chemistry, 2003, 80: 221.

Editor: Yingzhi GUANG Proofreader: Xinxiu ZHU