

# Discussion on the Pathogenesis and Treatment of Ulcerative Colitis based on the Theory of Environmental Poisonous Evils

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**Abstract:** *Ulcerative colitis is a common clinical chronic non-specific inflammatory bowel disease, and environmental toxicity is an emerging Chinese medicine etiology in recent years. With the rapid development of industrialization, resource depletion and environmental pollution are becoming increasingly serious, and the incidence of ulcerative colitis is also increasing. This paper takes the theory of environmental toxicity as the starting point, discusses the correlation between environmental toxicity and ulcerative colitis from the five viscera and intestinal microecology, and puts forward the prevention and treatment of ulcerative colitis from the perspective of "treating the disease before it is diagnosed", with a view to providing a certain theoretical basis for the clinical prevention and treatment of ulcerative colitis.*

**Keywords:** Environmental toxicity, Environmental pollution, Ulcerative colitis.

## 1. Introduction

Ulcerative colitis is a kind of chronic, recurrent, non-specific inflammatory bowel disease whose etiology is not yet completely clear. With mucosal inflammation as the main manifestation, the lesions are mainly confined to the colorectal mucosa and submucosa, and the main clinical characteristics are abdominal pain, diarrhea, mucopurulent and bloody stools, and acute and severe pains, because of its long duration of the disease and easy to recur, so it is categorized under the category of "prolonged dysentery" in traditional medicine. The category of "prolonged dysentery" in traditional medicine [1]. The onset of ulcerative colitis is closely related to genetic, environmental, dietary, and lifestyle factors [2]. Ulcerative colitis is also a type of inflammatory bowel disease and is more common than Crohn's disease worldwide. And in recent years, with the rapid development of Asian countries, the incidence of ulcerative colitis has been increasing year by year, and the total incidence of ulcerative colitis is now 1.2-20.3 per 100,000 people [3]. At the same time, with the economic development, environmental toxic evil as an emerging etiological doctrine, gradually came into people's view. Environmental poisonous evil is a kind of poisonous evil produced by environmental pollution and invading the human body through the skin and hair or the mouth, nose, and other official orifices [4]. The "holistic concept" of Chinese medicine and the "unity of man and nature" believe that man and nature are an organic whole, and that the development of human society inevitably has some impact on nature, while nature will also feedback the consequences to mankind itself [5]. In recent years, the concept of "ecological medicine" [6] and the increasing incidence of ulcerative colitis have shown that people are paying more and more attention to the correlation between the two. In this paper, we would like to explore the pathogenesis of environmental toxicity in ulcerative colitis from a theoretical perspective, in order to provide more effective strategies for clinical prevention and treatment.

## 2. Theory of Environmental Poisonous Evils

### 2.1 The Concept of Environmental Toxicity

Environmental toxicity refers to a kind of exogenous evil produced by environmental pollution, invading the human body by the skin and hair or the mouth, nose and other organs and distinguishing it from the six evils and plague gas, also known as environmental pollution toxicity [7]. Environmental pollution is a product of the contradiction between China's rapid industrial development and its natural carrying capacity [8]. As China enters the middle stage of industrial development, people's weak awareness of environmental protection in specific actions, and the lack of implementation of environmental protection policies by environmental protection departments have made China's environmental pollution problem increasingly serious, so people have become more and more aware of the importance of the environment to human development [9]. The discharge of waste gas and wastewater, the application of pesticides and fertilizers, the greening caused by traffic and high-rise buildings, the sharp reduction of forests, the noise generated by construction and decoration, and the radiation accompanied by the information age are all inseparable from the formation of environmental pollution. Air pollution, water pollution, marine pollution, noise pollution, radiation pollution, etc. are all products of the rapid development of industry and agriculture, and are environmental pollutants that can endanger human health, and are also the main components of environmental poison [7].

### 2.2 Etiological Characteristics of Environmental Toxicity

Toxic gases, poisons and other harmful substances in environmental poisoning exist in all aspects of the environment, directly or indirectly affecting human health. It has the characteristics of acute onset, rapid transmission, easy-to-hurt righteousness, internal and viscera, subdued and then onset, and difficult to heal after prolongation [10]. At the

same time, it also has unique etiological characteristics that are different from traditional poisons.

### 2.2.1 External sensibility

Environmental poison also belongs to the external evil qi, but it is different from the six lewd and furious qi, so it has its own uniqueness while having the characteristics of external sense. Both of them invade the human body by fur, mouth and nose, etc., but environmental poisons are often caused by definite toxicity, which is different from the natural bias of the six prostitutions; Second, environmental poison is often a feedback from nature to human behavior, which is ultimately caused by man-made, and the six evils belong to climate change [11].

### 2.2.2 Concomitant

Environmental poisons can cause disease on their own, or they can be combined with other evil spirits to cause disease [12]. Environmental poisons are ubiquitous in nature, among which poisonous gases and poisons invade the human body from the mouth and nose, such as biogas, pesticides, etc., will cause acute or chronic poisoning; Some environmental poisons do not cause poisoning reactions, but affect the body's qi and blood operation and the functions of the five organs. For example, air pollution affects the lough food and affects the body's qi, blood and fluid, resulting in digestive system diseases. At the same time, environmental poison can also be combined with the six prostitutions. Air pollution, wind evil, and cold evil jointly invade the human body, affecting the lung qi and rapidly depleting the righteous qi, thus causing disease.

### 2.2.3 General susceptibility

Traditional Chinese medicine advocates a holistic concept, indicating the unity of man and nature [13]. Human beings have never been able to conquer and dominate nature, but rely on nature for survival, and the scientific concept of development also requires us to conform to and respect nature. Climate change in nature is closely related to human pathology, and environmental poisons are produced in human activities and also exist in nature, so human beings living in nature are inevitably exposed to environmental poisons, and the population is generally susceptible.

### 2.2.4 Toxicity

The toxic gases contained in environmental poisons, such as PM<sub>2.5</sub> (2.5-micrometer particulate matter), are highly toxic, teratogenic and carcinogenic, ranging from dry eye to a series of cancers [14]. Qin Ying believes that environmental poisons are hidden and act on the human body for a long time, which can indirectly affect male sperm motility and eventually lead to infertility [15]. Water and pesticide pollution have also greatly increased the rate of people's disease [16]. In addition, cardiovascular diseases, blood diseases and some allergic diseases are inseparable from environmental pollution.

## 3. The Pathogenesis of Environmental Toxicity and Ulcerative Colitis

Ulcerative colitis is a type of inflammatory bowel disease, and the influence of environmental factors on the symptoms, course, and prognosis of inflammatory bowel disease has been supported by a number of observations [17]. Ulcerative colitis is a chronic disease with a low mortality rate. In 1956, the first case of ulcerative colitis was discovered in China, and at the turn of the 21st century, the development of industrialization affected the diet and environment of human beings, thus affecting the intestinal microbiome, making the prevalence of inflammatory bowel disease continue to grow, and the incidence of ulcerative colitis in Asia is also on the rise [18]. There are also studies that show that changes in the lifestyle of individuals and the external environment in industrialized societies are parallelly related to inflammatory bowel disease [19]. All these indicate that environmental pollution is inseparable from the occurrence and development of ulcerative colitis.

### 3.1 Discuss Environmental Toxicity and Ulcerative Colitis from the Perspective of Viscera

#### 3.1.1 Poison the lungs

Traditional Chinese medicine advocates that "the lungs pass through the fur", and the development has gradually formed the theory of the "lung-fur" functional axis, and the lungs and fur complement each other in terms of excretion and moisturization, which is mainly manifested in the transparency of the skin, the opening and closing of the skin is regulated by the lung qi, and the compress and moisturizing of qi, blood and fluid are affected by the lungs and the main joints of the lungs [20]. Environmental poisons, especially air pollution, invade the human body, usually through the fur, and the fur is attacked by evil qi and transmitted inward to the lungs. The lungs dominate the qi of the body, and when it is attacked by evil qi, it is propagated and abnormal. The lungs and the large intestine complement each other in the qi and fluid, and the lung and large intestine qi are mainly declining, and if the lung qi is released and suppressed, the conduction of the large intestine is damaged, causing constipation, etc.; The main function of the lungs is to unobstruct and regulate the waterways and regulate the infusion of fluid in the human body, while the large intestine is mainly connected to the fluid, and participates in the lubrication of stool [21]. In addition, if the lungs produce phlegm and dampness, it will be injected into the large intestine, and the qi and blood will be imbalanced, and the dampness and heat will be stagnant in the large intestine, which can become dysentery; If the lung qi is weak, the qi is not smooth, blood stasis is stagnant, stagnation in the intestines, damage to the intestinal mucosa, and ulcerative colitis can also be formed [22].

#### 3.1.2 Poison enters the spleen

The discharge of industrial wastewater and domestic sewage, as well as the use of agricultural fertilizers, etc., have caused water and soil pollution and marine pollution. Against this backdrop, toxic substances are inevitably carried by marine organisms and various foods and drinking water. The spleen is closely related to the mouth. Unclean food entering the stomach through the mouth can damage the functions of the spleen and stomach. The spleen is the origin of acquired constitution and the source of qi and blood production. The

spleen and stomach, as the hub of the whole body's qi lifting, have the function of raising and clearing and lowering turbidity, and the two are in harmony with each other. Weakness of the spleen and loss of transport function is an important basis for the pathogenesis of ulcerative colitis. If the spleen loses its function of transport, it will be weak; and if the stomach loses its function of lowering turbidity, then the water and dampness will not be transported, coupled with the invasion of poisonous evils, the conduction function of the large intestine will be impaired, and the dampness will be produced in the body, and it will be converted into heat and stagnant in the intestines, and it will develop into abdominal pain, diarrhea, mucus, pus and bloody stool over time [23].

### 3.1.3 Poison attacks the heart, liver, and kidneys

In the context of rapid economic development, various other industries are also advancing at a swift pace. Industrial noise, traffic noise, residential noise, and social noise have already had a significant impact on people's quality of rest. Noise pollution poison can act on the heart, liver and kidneys [24]. The function of the heart is mainly opening the ears, and storing spirit and controlling mental and emotional activities. The toxic effects of noise pollution disturb the mind and thus affect other internal organs. The heart and small intestine are internally and externally related. To this day, there is a theory called the "heart-intestine axis." The small intestine's transformative function depends on the warming provided by yang qi and the nourishment of the heart's blood. The separation of the useful from the waste function of the small intestine can also make the subtle substances in the water valley nourish the heart and veins [25]. If the heart and blood are not running smoothly and the mind is not nourished, the intestinal tract will not be nourished, and the separation of the useful from the waste function will be abnormal, and the human body will have abdominal pain and diarrhea.

The kidneys are connected to the ears, and noise pollution, as a toxic force, harms the foundation of one's innate health. Kidney storing essence, the innate essence and the acquired essence of the spleen nourish each other, if the acquired essence can not replenish the innate essence, the large intestine will be damp and turbid, and the qi and blood will be lost, and eventually refractory ulcerative colitis will be formed [26]. Partial reflection of the physiologic and pathologic state of the kidney by the condition of urination, ejaculation and defecation. Therefore, kidney yang, kidney yin, and kidney qi work together to maintain the conduction of the large intestine and the ability of the anus to open and close. If the kidney yang is insufficient, the fire from the gate of life will decline, and the body will have symptoms such as abdominal pain and diarrhea [27].

The noisy environment of long-term life often amplifies people's anxiety, impatience and other emotions, and noise pollution poisons affect the liver, often affecting the liver's excretion function. At the same time, the above environmental toxic evils invade other organs and also affect the liver, such as the descending of lung qi affects the rising of liver qi, the spleen governs the movement and transformation of liver qi, the liver and kidney are homologous, and the heart conceals spirit affects the liver conceals soul, etc., all these indicate that environmental toxic pathogens involve the liver from

different angles. In addition, emotional obstruction, liver qi is unfavorable, Qi can also cause the poor operation of the large intestine down abnormal, injury to the intestines, the body will appear abdominal pain, diarrhea and other symptoms. Studies have shown that emotional factors such as depression and anxiety run throughout the ulcerative colitis [28].

## 3.2 Poisonsmental Toxicity and Ulcerative Colitis from the Perspective of Intestinal Microecology

Intestinal microecology refers to the aggregation of microorganisms in the intestine, which constitutes a complex and relatively balanced microbial population with diverse characteristics. Gut microbiota participates in the regulation of human body, nutrition metabolism, immunity and defense, and is an indispensable part of maintaining human homeostasis. Studies have shown that environmental toxins such as heavy metals and pesticides have a significant impact on microbiome, such as gut Microbial metabolism and diversity, and the evidence linking environmental toxin exposure to gut-related diseases is growing [29]. A variety of neurotoxins in the environment can cause oxidative stress and DNA damage, which can damage immune function and gut microbial homeostasis [30]. Environmental pollutants such as heavy metals and organic pollutants can change the composition of the intestinal microbial community, break the homeostasis of the intestinal microbiota, and cause metabolic disorders, which in turn lead to a variety of diseases and health problems [31]. Environmental toxins invade the human body, cause intestinal microecological disorders and damage the intestinal mucosa, so that the human body appears abdominal pain, diarrhea and other symptoms, and eventually form a ulcerative colitis.

## 4. Treatment of Ulcerative Colitis based on Environmental Toxicity

### 4.1 Prevent Diseases Before They Occur and Improve the Environment

Since man and nature are an organic whole, and the concept of "preventive treatment of disease" in traditional Chinese medicine puts forward the concept of prevention before they occur, for ulcerative colitis, it is required to coordinate the patient's intestinal flora from the root cause by strengthening the spleen, protecting the kidneys, and nourishing the spirit, so as to maintain the balance of yin and yang in the body. Environmental toxins have permeated all aspects of people's lives, such as air pollution in every breath of people will have an impact on the human body, masks can reduce atmospheric particles from the source of human body; Soil and water pollution is caused by poisonous and evil things that can not be prevented. In recent years, green and healthy food has also been constantly mentioned. From the perspective of pathogenesis, protecting the spleen and stomach is the most important measure to prevent ulcerative colitis. In addition, it is necessary to alleviate the irritability caused by noise pollution, improve mood and change the living environment. In addition to reducing the invasion of environmental poisons from the source, it can also maintain one's own healthy qi. In addition, to protect the environment and reduce pollution, from the perspective of the modern biopsychosocial medical model, the idea of "harmony between man and nature" in

traditional Chinese medicine can guide people to form a healthy state of “harmony between nature and man” with a good living system, stimulate the immune system ability in the body, and fundamentally improve the body’s ability to resist diseases [32].

#### 4.2 Prevent the Disease from Changing, and Help the Righteous qi and Dispel the Evil Spirit

Environmental toxins invade the human body, and the latent evil energy accumulates in the body over time, depleting the body’s healthy qi. Therefore, the principle in treatment should focus on supporting the healthy qi to eliminate the evil energy. Some scholars believe that liver qi stagnation and spleen qi weakness are the main pathogenesis of the occurrence and development of ulcerative colitis, so regulating liver qi and healthy spleen qi should run through the whole treatment of ulcerative colitis, and on this basis, grasp the pathological manifestations of dampness, heat, stasis and deficiency at different stages [33]. During the Jin and Yuan dynasties, Liu Wansu proposed that “Regulating Qi will naturally eliminate tenesmus, and blood flow will naturally cure pus and blood stools” and pus and blood stools were also caused by Qi and blood disorders and intestinal damage, therefore, in the treatment of ulcerative colitis, regulating both Qi and blood is also its guiding principle. For example, shaoyao decoction treats ulcerative colitis of large intestine with damp-heat syndrome, aiming at regulating qi and activating blood, clearing heat and promoting dampness. It can also reduce intestinal inflammation, regulate flora and promote mucosal repair [34]. Some scholars believe that the deficiency of spleen and kidney is the most fundamental pathogenesis of ulcerative disease, which not only affects its onset, but also affects the prognosis and outcome of the disease [35]. Therefore, warming and invigorating the spleen and kidney to support healthy qi is the way to seek the root of the disease.

#### 4.3 Prevent Recurrence after Illness and Regulate Internal Organs

The invasion of environmental toxic pathogens to the human body will mostly cause the dysfunction of zang-fu organs. After treatment, the ulcerative colitis such as Qi stagnation, blood stasis and damp-heat have disappeared, but the healthy Qi has not been recovered. At this time, it is easy to feel the toxic pathogens again. Therefore, it is necessary to avoid the invasion of environmental toxic pathogens while supporting the healthy qi. The main manifestation of ulcerative colitis is localized ulceration of the intestinal mucosa. Although the location of the lesion is limited, the multi-organ, multi-system and psychological state of the patient have an impact on the onset of ulcerative colitis, and the late stage of the disease prone to malnutrition and other systemic diseases, so the treatment ulcerative colitis should be from the “Five zang-organs as a whole” concept of the whole to dialectical treatment, conditioning qi and blood [36]. Strengthening the spleen, protecting the kidneys, and nurturing the spirit are methods to restore healthy qi during the recovery phase. At the same time, we should also pay attention to diet and emotions in daily life, avoiding the invasion of toxins and preventing the recurrence of illnesses.

## 5. Conclusion

Man and nature are an organic whole. Since human beings entered the high-carbon era, resource consumption and carbon emissions are also accelerating. In the face of the phenomenon of “Ecological environment overload”, human beings are a community of life with one prosperity and one loss[37]. With the aggravation of environmental pollution and the invasion of environmental toxins, the incidence of ulcerative colitis disease is also increasing. From the perspective of environmental toxin, we can scientifically understand the etiology and pathogenesis of ulcerative colitis disease. It is found that in the treatment and prevention of ulcerative colitis disease, we should fully consider the environmental toxin and take ecological civilization as the premise to treat it as a whole, in the treatment, we should follow the thought of preventive treatment of disease.

## References

- [1] SHI Rui, LI Junxiang SHEN Hong, et al. Experts consensus on traditional Chinese medicine diagnosis and treatment of ulcerative colitis(2023)[J]. China Journal of Traditional Chinese Medicine and Pharmacy, 2024, 39(01): 288-296.
- [2] Agrawal M, Jess T. Implications of the changing epidemiology of inflammatory bowel disease in a changing world[J]. United European Gastroenterology Journal, 2022, 10(10): 1113-1120.
- [3] Gajendran M, Loganathan P, Jimenez G, et al. A comprehensive review and update on ulcerative colitis[J]. Disease-a-month, 2019, 65(12): 100851.
- [4] JIANG Liangduo, QIN Ying, YANG Jun, et al. On The Environmental toxin in TCM[J]. Journal of Basic Chinese Medicine, 1999(09): 5-7+69.
- [5] Li Zhuo. The Philosophical Basis, Classical Meaning and Modern Value of the Concept of “Uniting Human and Universe” [J]. History of Chinese Philosophy, 2023(06): 12-18.
- [6] ZHANG Xi. The ecological medicine ideas and contemporary value of Chinese traditional medicine[D]. Yunnan University of Traditional Chinese Medicine, 2016.
- [7] ZHENG Hongxin. New Hypothesis about pathogenesis of TCM: environmental evil[J]. Liaoning Journal of Traditional Chinese Medicine, 2002(02): 63-64.
- [8] WANG Zhenxing, WANG Fei. Preliminary Study of the Effect of Environmental Toxin on Lung Disease[J]. Journal of Basic Chinese Medicine, 2016, 22(02): 206-208.
- [9] LIU Yufei. Research on the harm of air pollution to environmental protection and its countermeasures[J]. Cleaning World, 2023, 39(11): 169-171.
- [10] CHEN JcAllergic Rhinitis[J]. Chinese Journal of Information on Traditional Chinese Medicine, 2020, 27(02): 113-115.
- [11] Dai Ming, Jia Chunhua, Liu Qinghua, et al. Investigation on the Etiology, Pathogenesis, Syndrome Differentiation and Treatments of Exogenous Diseases with the Metaphor of Environment[J]. Modernization of Traditional Chinese Medicine and Materia Medica-World Science and Technology, 2022, 24(01): 414-418.

- [12] ZHANG Fan, KANG Shuai, YUAN Weiling, et al. Exploration of Eczema Onset Caused by Environmental Toxins[J]. JOURNAL OF BASIC CHINESE MEDICINE, 2023, 29(07): 1076-1078.
- [13] GUO Shansha, HUANG Min, JIN Chengqiang, et al. Discussion on the significance of “Huangdi Neijing” and “Four Seasons Health Preservation” to improve the body’s own disease prevention ability[J]. The Medical Forum, 2023, 27(31): 114-116.
- [14] ZHONG Yuan, ZHAO Pan, TAN Shi, et al. Discussing the Dry Eye Treatment of PM2. 5 Based on Environmental Toxic Pathogen Theory[J]. China Journal of Chinese Ophthalmology, 2023, 33(10): 955-957+977.
- [15] ZHAO Bing, LIU Chao, DING Hualin, et al. Discussion on the treatment of male infertility based on poison theory[J]. Chinese Journal of Human Sexuality, 2021, 30(08): 127-130.
- [16] ZHANG Hong-liang, ZHAO Lin-xuan, MA Shu-qi, et al. The impact of pesticide use on elders’ medical expenditure through water pollution[J]. China Environmental Science, 2023, 43(06): 3203-3210.
- [17] Timmer A. Environmental influences on inflammatory bowel disease manifestations: lessons from epidemiology[J]. Digestive Diseases, 2003, 21(2): 91-104.
- [18] Kaplan G G, Ng S C. Understanding and preventing the global increase of inflammatory bowel disease[J]. Gastroenterology, 2017, 152(2): 313-321. e2
- [19] Cholaranee A, Ananthakrishnan A N. Environmental hygiene and risk of inflammatory bowel diseases: a systematic review and meta-analysis[J]. Inflammatory bowel diseases, 2016, 22(9): 2191-2199.
- [20] WU Yige, ZHOU Guang. Theoretical Basis and Clinical Value of ‘Lung-Skin Fur’ Functional Axis[J]. Acta Chinese Medicine and Pharmacology, 2023, 51(06): 55-58.
- [21] HE Wei. Discussion on the theoretical meaning and biological mechanism of “lung is connected to the large intestine and the large intestine corresponds to the skin” [J]. Journal of Beijing University of Traditional Chinese Medicine, 2023, 46(10): 1350-1356.
- [22] ZHANG Chuchu, JIANG Ting, HUA Xin, et al. Discussion on Treatment of Ulcerative Colitis Based on Theory of Interior- Exterior Relationship Between Liver and Large Intestine[J]. New Chinese Medicine, 2023, 55(15): 180-183.
- [23] ZHANG Xiaoming, LIU Yuedong, DU Jing, et al. Research Progress on Etiology and Pathogenesis of Ulcerative Colitis under Guidance of Traditional Chinese Medicine Theory[J]. Chinese Archives of Traditional Chinese Medicine, 2023, 41(09): 46-52.
- [24] KANG Shuai, LI You-ran, LI Bing, et al. Discussion of Urticaria Etiology Based on Environmental Toxin[J]. JOURNAL OF BASIC CHINESE MEDICINE, 2022, 28(04): 507-509+555.
- [25] Long Dan, Mao Chenhan, Zhu Ying, et al. Treatment of Ulcerative Colitis by Warming Yang and Dissipating Blood Stasis from the Perspective of “Exterior-interior Relationship between Heart and Small Intestine” [J]. Journal of Emergency in Traditional Chinese Medicine, 2022, 31(09): 1394-1397.
- [26] LIU Feng, LIU Lin, WANG Chuijie, et al. Progress of Etiology, Pathogenesis and Treatment of Ulcerative Colitis[J]. Journal of Shandong University of Traditional Chinese Medicine, 2021, 45(01): 143-147.
- [27] LI Congyi, LIN Caizhi, HU Naiqiang, et al. To explore the pathogenesis of ulcerative colitis based on “five zang-organs correlation” [J]. Liaoning Journal of Traditional Chinese Medicine, 2019, 46(05): 961-964.
- [28] LIU Xinying, CHEN Shengliang. Advances in Study on Role of Psychological Factors in Ulcerative Colitis[J]. Chinese Journal of Gastroenterology, 2018, 23(03): 173-176.
- [29] Nalage D, Sontakke T, Biradar A, et al. The impact of environmental toxins on the animal gut microbiome and their potential to contribute to disease[J]. Food Chemistry Advances, 2023, 3: 100497.
- [30] Singh S, Sharma P, Pal N, et al. Impact of Environmental Pollutants on Gut Microbiome and Mental Health via the Gut–Brain Axis[J]. Microorganisms, 2022, 10(7): 1457.
- [31] GAO Yuan, LU Chenxi, YUAN Peng, et al. Research progress and prospect of relationship between gut microbiota and environmental health[J]. Environmental Chemistry, 2021, 40(01): 1-10.
- [32] ZHOU Sheng-nan, LI Jie, SHEN Jun-long, et al. Research on the Ecological Balance Mechanism Contained in the “Harmony between Human and Nature” in Traditional Chinese Medicine[J]. Medicine and Philosophy, 2023, 44(08): 68-71.
- [33] LI Na, HAO Xu-rui, LI Wei-kang, et al. Discussion on LIU Qi-quan’s experience in treating ulcerative colitis from liver and spleen[J]. China Journal of Traditional Chinese Medicine and Pharmacy, 2020, 35(02): 735-737.
- [34] LI Yanhong, WU Dongsheng, LU Yi, et al. Shaoyatong and Its Modified Formulas in Treatment of Ulcerative Colitis: A Review[J]. Chinese Journal of Experimental Traditional Medical Formulae, 2023, 29(09): 37-45.
- [35] ZHU Yan, LIU Da-ming, LIU Quan-xi, et al. TCM Diagnosis and Treatment of Ulcerative Colitis[J]. Journal of Medical Information, 2021, 34(03): 167-169.
- [36] LI Chenyao, LIU Yanmei, DONG Jun, et al. Discussion on the treatment of ulcerative colitis from the holistic view of five zang-organs[J]. Global Traditional Chinese Medicine, 2022, 15(1): 104-107
- [37] Fu Caiwu. “Ecological Overload” as a “Civilizational Variable”: —A Historical View of Ecological Civilization[J]. Theory Monthly, 2023(9): 142-152.