Modern Application of Classic Traditional Chinese Medicine Formulas in Specific Diseases

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Abstract: Classic Traditional Chinese Medicine (TCM) formulas are an essential component of TCM, embodying profound theoretical foundations and unique practical experiences, and serving as a crucial guarantee for the clinical efficacy of TCM. In recent years, with the development of modern medical technologies, research on the modernization of classic formulas has become one of the hotspots in the field of TCM. Among them, Minor Bupleurum Decoction, a representative formula from the Treatise on Febrile Diseases, has demonstrated broad adaptability and excellent therapeutic effects in clinical applications due to its intricate formulation and remarkable efficacy. This article systematically analyzes and summarizes the mechanisms of action and application value of Minor Bupleurum Decoction in areas such as liver diseases and febrile illnesses, starting from the classic theoretical origins, medicinal composition, and traditional effects of the formula, and integrating modern pharmacology and clinical research. Additionally, this article explores the major issues and future directions in the modernization research of classic TCM formulas, aiming to provide scientific evidence for the modernization and internationalization of TCM. By uncovering the intrinsic rules of classic formulas and integrating them with modern science, the exploration of their clinical potential not only promotes the inheritance and innovation of TCM but also provides important ideas for addressing contemporary medical challenges.

Keywords: Traditional Chinese Medicine, Formula, Minor Bupleurum Decoction

1. Theoretical Foundation and Historical Development of Classic Traditional Chinese Medicine Formulas

1.1. Theoretical Origins and Characteristics of Classic TCM Formulas

Classic TCM formulas originated from the long-term accumulation of ancient Chinese medical practice and are an important component of the TCM theoretical system, possessing distinct theoretical origins and unique characteristics. From a theoretical perspective, the principles of formula composition are deeply influenced by the foundational theories of TCM. For instance, the concepts of "Yin-Yang balance" and "Five Elements generation and restriction" proposed in the *Inner Canon of Huangdi* laid the philosophical foundation for formula compatibility, while classical works such as the *Treatise on Febrile Diseases* and *Synopsis of Golden Chamber* systematically explained the clinical application of formulas through the system of dialectical treatment. These theories

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emphasize the synergistic effects of herbs and the critical influence of dosage ratios on therapeutic efficacy, forming the compatibility principle of "Monarch, Minister, Assistant, and Courier" in formulas. This reflects the holistic approach and individualized treatment philosophy of TCM [1].

In addition, classic TCM formulas are characterized by their meticulous formulation and remarkable efficacy. On one hand, the composition of these formulas is rigorous, with highly coordinated interactions between the herbs. This not only allows for targeted treatment of the disease's root cause but also balances and regulates the body's overall function. On the other hand, classic formulas focus on repeated validation in clinical practice, ensuring high safety and adaptability. For example, Minor Bupleurum Decoction, as a classic formula, can soothe the liver and relieve depression while harmonizing both the exterior and interior, making it suitable for various diseases and exemplifying the flexibility of TCM's dialectical treatment. By exploring its theoretical origins and characteristics, we can better guide modern formula research and provide theoretical support for the inheritance and innovation of TCM.

1.2. Classification of Formulas and Their Position in the History of TCM

The classification of TCM formulas is based on the TCM theoretical system and is the result of a systematic summary of the functional characteristics, clinical applications, and structural composition of formulas. Based on their therapeutic functions, formulas can be classified into categories such as exterior-releasing formulas, heat-clearing formulas, tonifying formulas, harmonizing formulas, dampness-dispelling formulas, phlegm-resolving, cough-stopping, and asthma-relieving formulas, among others. This classification method helps clinicians quickly select the appropriate formula based on the patient's condition. Additionally, formulas can also be classified based on their compatibility characteristics and formulation principles. For example, the compatibility structure of Monarch, Minister, Assistant, and Courier forms the basis for single-herb formulas, compound formulas, and modified formulas, further reflecting the flexibility and specificity of TCM's dialectical treatment.

In the historical development of TCM, formulas have not only been the core tool in clinical practice but also the crystallization of TCM theory and experience. From the theoretical foundations laid in the *Inner Canon of Huangdi* to the establishment of the principles of dialectical treatment in the *Treatise on Febrile Diseases* and *Synopsis of Golden Chamber*, and the subsequent enrichment and development through the works of many later practitioners, formulas have always occupied a central position in TCM. In particular, the *Treatise on Febrile Diseases* pioneered the integration of formulas with the Six Meridians syndrome differentiation, greatly promoting the standardization and systematization of the study of TCM formulas. Therefore, the classification and historical position of TCM formulas not only reflect the developmental trajectory of TCM theory but also provide valuable theoretical guidance and historical experience for modern formula research.

2. Composition and Traditional Efficacy of Minor Bupleurum Decoction in the *Treatise on Febrile Diseases*

2.1. Medicinal Composition and Therapeutic Functions of Minor Bupleurum Decoction

Minor Bupleurum Decoction is a representative classic formula from the *Treatise on Febrile Diseases*, composed of seven ingredients: Bupleurum, Scutellaria, Ginseng, Licorice, Fresh Ginger, Jujube, and Pinellia. It embodies the essence of the TCM principle of dialectical treatment. The formula is meticulously crafted, with each herb complementing one another to create a significant synergistic effect. Among these, Bupleurum is the Monarch herb, which disperses the liver, relieves depression, and harmonizes the exterior and interior, making it the core of the formula. Scutellaria is the Minister herb, clearing heat and drying dampness, enhancing the effect of clearing internal heat. Pinellia and Fresh Ginger are the Assistant herbs, harmonizing the stomach, counteracting counterflow, and

regulating the Qi of the middle burner. Ginseng and Jujube tonify the Qi, strengthen the spleen, support the body's vital energy, and Licorice harmonizes the actions of the other herbs, reflecting the compatibility principle of "Monarch, Minister, Assistant, and Courier."

In terms of therapeutic functions, Minor Bupleurum Decoction is suitable for Shaoyang disorders and has the effects of harmonizing the exterior and interior, soothing the liver, relieving depression, clearing heat, transforming phlegm, and supporting the righteous Qi while dispelling pathogens. The *Treatise on Febrile Diseases* clearly indicates that it is used to treat Shaoyang disorders, with symptoms such as alternating chills and fever, fullness and discomfort in the chest and flanks, irritability, and a preference for vomiting. Its clinical applications have since expanded beyond Shaoyang disorders. Modern research shows that Minor Bupleurum Decoction has a beneficial regulatory effect on liver diseases, respiratory conditions, and some chronic inflammatory diseases, providing scientific evidence for its wide application and demonstrating the modern value of traditional herbal formulas.

2.2. Documentation and Clinical Application of Minor Bupleurum Decoction in Classical TCM Literature

As a classic TCM formula, Minor Bupleurum Decoction is explicitly recorded in the *Treatise on Febrile Diseases* as the core treatment for Shaoyang disorders. Its efficacy covers various aspects such as harmonizing the exterior and interior, soothing the liver, relieving depression, clearing heat, and transforming phlegm. Zhang Zhongjing, in the *Treatise on Febrile Diseases*, describes the indications for Minor Bupleurum Decoction in detail, including typical symptoms of Shaoyang disorders such as "alternating chills and fever, fullness and discomfort in the chest and flanks, a lack of desire to eat or drink, irritability, and preference for vomiting." These symptoms are often associated with a condition in which external pathogens are not fully resolved and internal stagnation has not been relieved, resulting in a disharmony between the interior and exterior. Minor Bupleurum Decoction, by harmonizing both the exterior and interior and balancing the internal and external conditions, exemplifies the principle of dialectical treatment [2].

In addition to the *Treatise on Febrile Diseases*, subsequent classical TCM texts have explored the scope of application and modifications of Minor Bupleurum Decoction. For instance, the *Golden Mirror of Medicine* notes that Minor Bupleurum Decoction is not only suitable for treating external Shaoyang disorders but can also be modified for use in treating gynecological conditions, internal liver diseases, and the later stages of febrile illnesses. Furthermore, the *Differentiation of Warm Diseases* mentions that the formula can be adjusted for use in conditions characterized by mixed damp-heat or stagnation of Qi. Modern clinical practice confirms that Minor Bupleurum Decoction has broad applicability in the treatment of chronic liver diseases, digestive system disorders, and certain infectious diseases, fully demonstrating its flexibility and universality as a classic formula and providing a valuable theoretical foundation and practical experience for contemporary TCM clinical research.

3. Modern Pharmacological Research on Minor Bupleurum Decoction in the Treatment of Liver Diseases

3.1. Regulatory Effects of Minor Bupleurum Decoction on Liver Function

Minor Bupleurum Decoction, as a classic herbal formula, demonstrates significant pharmacological effects and clinical efficacy in regulating liver function. Modern studies show that the main active components in Minor Bupleurum Decoction, such as Bupleurum saponins, Scutellaria flavonoids, and Ginseng saponins, possess multiple functions, including liver cell protection, anti-inflammatory, antioxidant, and immune modulation. These active ingredients work by inhibiting oxidative stress

and inflammation in liver cells, promoting liver cell regeneration and repair, thereby effectively improving liver dysfunction. For instance, experimental studies have found that Minor Bupleurum Decoction can reduce serum transaminase (ALT, AST) levels in animal models of liver injury, while enhancing the activity of antioxidant enzymes (such as SOD, GSH-Px), alleviating free radical-induced damage to liver cells. Additionally, Minor Bupleurum Decoction exhibits a certain inhibitory effect on liver fibrosis, as it regulates the TGF- β 1/Smad signaling pathway and reduces collagen deposition, effectively delaying the progression of liver fibrosis [3].

In clinical applications, Minor Bupleurum Decoction is commonly used to treat various liver diseases, including viral hepatitis, autoimmune liver disease, and drug-induced liver injury. Studies show that treatment with Minor Bupleurum Decoction significantly improves symptoms such as fatigue, poor appetite, and jaundice in patients with chronic hepatitis B, while enhancing liver function indicators and lowering HBV-DNA levels. This provides a reliable traditional Chinese medicine approach for the treatment of chronic liver diseases. Therefore, the regulatory effects of Minor Bupleurum Decoction on liver function not only reflect the holistic approach and dialectical treatment principles of traditional Chinese medicine but also provide important scientific support for modern liver disease treatment.

3.2. Active Ingredients and Mechanisms of Action in Modern Pharmacological Research

Modern pharmacological research has revealed several active ingredients in Minor Bupleurum Decoction and their mechanisms of action, providing scientific evidence for its traditional efficacy. The Bupleurum saponins in Bupleurum are the main active substances, with anti-inflammatory, antipyretic, antioxidant, and immune-regulatory effects. These saponins can suppress the release of inflammatory cytokines such as TNF- α and IL-6, regulating immune responses in liver cells, thereby exerting anti-inflammatory and liver-protective effects. The Scutellaria flavonoids and baicalein in Scutellaria possess notable antioxidant and antiviral properties, protecting the liver by inhibiting viral replication and regulating oxidative stress pathways. The volatile oils in Pinellia and gingerols in Ginger mainly act on the central nervous and digestive systems, providing antiemetic effects and promoting gastrointestinal recovery. Furthermore, the ginsenosides in Ginseng and the polysaccharides in Jujube help tonify Qi, nourish Yin, and enhance the body's immune function.

In terms of mechanism, Minor Bupleurum Decoction's multi-component and multi-target characteristics enable it to regulate complex pathological conditions through modulation of cell signaling pathways. For example, it suppresses the MAPK and NF- κ B pathways to reduce inflammation while activating the Nrf2 signaling pathway to enhance antioxidant capacity, mitigating oxidative damage. The multi-target synergistic effect of this formula provides a theoretical basis for the treatment of multi-system diseases and demonstrates its broad potential in modern medical research.

4. Application and Mechanisms of Minor Bupleurum Decoction in Febrile Diseases

4.1. Modern Clinical Research on Minor Bupleurum Decoction in the Treatment of Febrile Diseases

Minor Bupleurum Decoction is widely used in the clinical treatment of febrile diseases, with modern research focusing on clarifying its mechanisms of action and indications. Febrile diseases are often accompanied by inflammatory responses and immune system disorders, and Minor Bupleurum Decoction plays a unique role in these conditions with its functions of harmonizing the exterior and interior and soothing the liver to relieve depression. Modern clinical studies have shown that Minor Bupleurum Decoction is significantly effective in treating infectious fevers, drug-induced fevers, and unexplained persistent fevers. For example, in the treatment of infectious fevers, Minor Bupleurum

Decoction regulates the levels of inflammatory factors such as IL-6 and TNF- α , reducing body temperature and alleviating systemic symptoms. Additionally, the saikosaponins in Bupleurum and the baicalin in Scutellaria have effects in inhibiting pathogen replication and enhancing the body's immunity, making it suitable for treating viral and bacterial fevers [4].

Studies have also found that Minor Bupleurum Decoction can significantly shorten the course of illness and reduce symptoms in the auxiliary treatment of influenza, upper respiratory infections, and some febrile diseases, while demonstrating high safety. Its modified applications have been verified in the treatment of damp-heat fevers, epidemic fevers, and conditions characterized by excessive heat-toxicity. Modern clinical research on Minor Bupleurum Decoction provides a Chinese medicine solution for the comprehensive treatment of febrile diseases, demonstrating the advantages of integrated Chinese and Western medicine treatment. It lays the foundation for exploring multidimensional intervention models for complex diseases.

4.2. Experimental Research Progress on the Mechanisms of Minor Bupleurum Decoction

Significant progress has been made in experimental studies on the mechanisms of Minor Bupleurum Decoction, providing scientific support for its traditional efficacy. Animal and cell experiments have shown that Minor Bupleurum Decoction can regulate the pathological state of the body through multiple pathways and targets, exhibiting significant anti-inflammatory, immune-modulatory, and antioxidant effects. In terms of inflammation, Minor Bupleurum Decoction reduces the expression of inflammatory factors such as TNF- α , IL-6, and COX-2 by inhibiting the activation of the NF- κ B signaling pathway, thereby alleviating tissue inflammation and damage. Additionally, it can regulate the MAPK pathway to further relieve both acute and chronic inflammation. Experimental studies have also shown that the main active ingredients in Minor Bupleurum Decoction, such as saikosaponins and baicalin, can effectively regulate oxidative stress levels, activate the Nrf2/HO-1 antioxidant pathway, and enhance the activity of superoxide dismutase (SOD) and catalase (CAT), thus protecting cells from free radical damage [5].

In terms of immune modulation, Minor Bupleurum Decoction balances Th1/Th2 immune responses, promoting the activity of T cells and NK cells, and enhancing the body's immune defense capabilities. Research has also found that Minor Bupleurum Decoction can regulate the TGF- β 1/Smad signaling pathway to inhibit the expression of fibrosis-related proteins, thus delaying the progression of tissue fibrosis. These experimental advancements further reveal the core mechanisms of Minor Bupleurum Decoction in immune regulation, anti-inflammation, and tissue protection. They provide a solid theoretical and experimental foundation for its clinical application in complex diseases, while also guiding the in-depth development of modern research on Chinese medicine formulas.

5. Challenges and Prospects of Modernizing Classic Chinese Medicine Formulas

5.1. Issues and Limitations in the Modernization of Chinese Medicine Formulas

The modernization of Chinese medicine formulas presents a broad prospect for the internationalization of traditional Chinese medicine (TCM) and the advancement of modern medicine. However, there are still many issues and limitations in practical research and application. First, the complexity of the formula composition and the multi-component, multi-target mechanisms of action of classic formulas pose challenges to modern research. The synergistic effects between various components in a formula are difficult to comprehensively analyze through a single-component research model, which makes it challenging to identify the pharmacological basis and specific mechanisms of action. Second, current research on Chinese medicine formulas heavily relies on animal experiments and cell models, lacking large-scale, rigorously designed clinical trials to support the scientific validity and effectiveness of their modern applications. Moreover, there remain certain

theoretical and practical discrepancies between the holistic concepts of TCM and modern medicine, which makes it difficult for modern interpretations of classic Chinese formulas to gain widespread acceptance in mainstream medicine.

At the same time, the modernization of formulas faces constraints in standardization and quality control. Due to the diverse sources of Chinese medicinal materials, which are affected by factors such as cultivation environment and processing methods, ensuring the consistency of quality is difficult, thus affecting the reproducibility of research and the stability of clinical applications. Finally, intellectual property protection and regulatory barriers for international promotion also limit the global application of TCM formulas. Therefore, future efforts should focus on strengthening interdisciplinary collaboration, integrating modern research methods with TCM theory, and optimizing standardized research and clinical trial designs, thereby laying a more solid scientific foundation for the modernization of classic Chinese medicine formulas.

5.2. Future Directions and Prospects for the Modernization of Chinese Medicine Formulas

The modernization of Chinese medicine formulas is a crucial pathway to advancing the internationalization of TCM and promoting the inheritance and innovation of Chinese medicine. Its future directions and prospects require a comprehensive expansion at the theoretical, technical, and practical levels. First, the integration of TCM theory with modern science should be strengthened, utilizing systems biology, multi-omics technologies (such as genomics and metabolomics), and artificial intelligence algorithms to reveal the pharmacological basis and mechanisms of action of Chinese medicine formulas. This approach will help establish a scientific framework for the modernization of formulas, encompassing both holistic and micro-level perspectives. Second, in terms of quality control, a comprehensive standardized system for the cultivation, processing, and production of medicinal materials should be established. Modern detection technologies, such as fingerprinting and mass spectrometry, should be used to ensure the consistency of formula components and the reproducibility of clinical effects. Additionally, clinical trial designs need to be further optimized, promoting multi-center, large-sample, randomized controlled studies to enhance the credibility and scientific rigor of Chinese medicine formula research.

6. Conclusion

As an essential component of TCM, classic formulas contain a wealth of theoretical foundations and practical experience, serving as a vital guarantee for clinical efficacy. This paper systematically analyzes the classic formula, Minor Bupleurum Decoction, from multiple aspects, including its historical origins, drug composition, traditional functions, and modern research progress. By reviewing the application and pharmacological effects of Minor Bupleurum Decoction in liver diseases and febrile conditions, the study reveals its unique multi-target and multi-mechanism characteristics, fully demonstrating the advantages of TCM in both holistic and individualized treatment. Modern research has confirmed that Minor Bupleurum Decoction has significant liver function-regulating, anti-inflammatory, immune-modulating, and antioxidant effects, and shows good clinical efficacy in the treatment of chronic liver diseases and infectious febrile conditions.

At the same time, this paper discusses the challenges faced by the modernization of classic Chinese medicine formulas, including the complexity of understanding the mechanisms of action, the limitations of clinical research design, and the deficiencies in standardization and quality control. In future development, attention should be paid to interdisciplinary collaboration and the integration of modern technologies to further uncover the material basis and mechanisms of action of formulas, improving research quality and scientific validity. By deepening the integration of modernization research and clinical practice, the inheritance and innovation of classic Chinese medicine formulas

will provide new solutions to modern medical challenges and lay a solid foundation for the international development of TCM.

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