

The Historical and Recent Scientific Development of Imperial Court Medicine from Qing Dynasty

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ABSTRACT

Imperial court medicine is a branch of traditional Chinese medicine (TCM) that has provided medical and health care services for the royal family since ancient China. It has accumulated a wealth of well-documented theories, and clinical practice experiences, including medications, acupuncture, massage and other treatments, which reflect the characteristics and needs of the imperial culture and environment. This review explores the development and highlights the major features of imperial court medicine in the Qing Dynasty (1644 AD-1911 AD), and discusses how imperial court

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medicine has been inherited and further advanced in modern times. It summarizes the practice and research of Imperial court medicine by focusing on two key aspects: medicated diets for health preservation and anti-aging strategies, with the aim to contribute understanding, and the promotion of imperial court medicine as a valuable cultural heritage and important source of health and wellness strategies for modern society.

KEYWORDS

Traditional Chinese Medicine (TCM), Imperial court medicine, Famous Classical Formulas, Medicated Diets, Anti-aging, Health Product

1. Introduction

Traditional Chinese Medicine (hereafter TCM) is a comprehensive medical system that developed based on a long history of theoretical development and practical experience. TCM considers human body as a complex ecosystem that interacts with the natural environment, forming a concept of “Unity of Nature and Man”, and particularly advocates the accordance with the nature. TCM physicians use various methods to regulate body functions and maximize body's self-defending ability especially in the elderly, via regulating the *Qi* in the body with reinforcing healthy (anti-pathogenic) *Qi* and eliminating pathogenic *Qi*, including Chinese medicine decoction and non-drug intervention techniques of acupuncture, tuina (Chinese therapeutic massage), qigong, mental adjustment, and nutrition treatments. In addition, the TCM physicians conduct individualized precision interventions by taking consideration of multiple environmental factors such as season timing, geographic region, and population groups, in addition to the diagnosis of the patient him/herself, to achieve the optimal preventive and therapeutic effects.

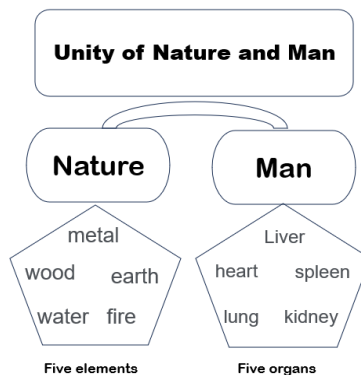


Figure1: Concept of “Unity of Nature and Man” in TCM

The imperial court, which served as the residence of the ancient emperors, symbolized the utmost authority of the royal class. Within this context, the Imperial Medical Institutions served the role of ensuring the well-being of the members of the imperial court. The Imperial Physicians employed herbal medicines and magical surgical techniques to prevent illnesses and extend the emperors' health and lifespan. Consequently, during the Qing Dynasty, the Imperial court medicine extensively gathered the knowledge of Traditional Chinese Medicine (TCM) from

previous dynasties, particularly the valuable experience in utilizing medicated diets and herbal prescriptions to extend the lifespan of the emperors. In this review, we aim to explore the history and development of Imperial court medicine in the Qing Dynasty, focusing on its theoretical system, diagnostic methods, medicated diets and treatment principles for anti-aging. The Qing Dynasty played a significant role in the development and prosperity of TCM, covering a variety of representative TCM prescriptions, such as “Qinggong Shoutao Pill”, which is still in use, produced and sold as over-the-counter (OTC) drug in pharmacy market nowadays. Besides, its traditional use, the effectiveness of Qinggong Shoutao Pill has been proven in various clinical trial studies and also in-depth pre-clinical pharmacological research studies. Moreover, we assess the scientific rationales regarding the contemporary uses of these typical TCM prescriptions and approaches, particularly the use of medicated diets for the mitigation of aging process. Our objective is to offer a thorough and comprehensive understanding of Imperial court medicine in the Qing Dynasty, which possesses unique value of intangible cultural heritage and provides new insight for leading future biomedical research in healthy aging.



Figure 2: The Imperial Court and Traditional Chinese Medicine in ancient times

2. History and Development of TCM

The understanding of TCM has been well documented, and can be generally classified into three major developmental phases, throughout the history of ancient China. At the early stage, Huang Di Nei Jing (黃帝內經), also known as the Yellow Emperor's Inner Classic, was the earliest existing medical textbook written in the 2nd century BCE. It formed the core and essential rationales of current TCM theory and practice in TCM university education curriculum in China. Huang Di Nei Jing (黃帝內經) proposed the concept of insufficiency of the five vital organs –

the heart, lung, liver, spleen, and kidney – which plays a significant role in human aging. It also systematically described the causes of accelerated or premature aging, such as an inadequate diet and excessive physical exertion, while it also emphasized the importance of preventive measures before the occurrence of illness. All these original fundamental TCM theories had been further evolved and developed in the subsequent dynasties.

During the Ming and Qing eras, the principles and practice of TCM had undergone a significant standardization and categorization, resulting in a more thorough and systematic literature. Apart from illness treatment, extensive strategies of health preservation for anti-aging have been developed, along with numerous innovative TCM formulas, and medicated diets. Similar to the idea of precision medicine in modern biomedicine, each of these TCM formulas is composed of several major TCM ingredients combined in a certain proportion. And these formulas can be slightly modified and adjusted according to the health condition of each individual patient, with an aim of optimizing the outcome effect on adjustment of abnormal body functioning. In the Qing Dynasty, the non-drug therapy was also used as an adjuvant treatment, including acupuncture, tuina, and spa, with development of a large number of existing medical devices in the Palace Museum.

TCM not only been practiced for thousands of years but has also gained popularity in the modern era. In recent times, a body of evidence from clinical trials and biomedical research has shown that the proven efficacies and modes of actions of TCM utilizing state-of-art technologies and biomedical research methodologies. In addition, TCM still plays an important role within China's medical and health system and pharmaceutical and health industries have also modernized TCM in various aspects. For instance, the main form of medication was decoction in ancient times, by heating the TCM ingredients with water to form the water decoction for oral consumption. However, there has been a shift towards extracting and purifying specific bioactive molecules from TCM in modern times with the potential for the extracted molecules to be developed as a new western drug. Certain active molecules and fractions from TCM have been found to have promising biological activities, high potency and low toxicity profiles; however, poor solubility and poor stability are some major challenges to hinder their further pharmaceutical development. Therefore, overcoming these problems to improve therapeutic efficacy of the TCM preparations has become a recent major focus of the pharmaceutical science field. Innovative TCM drugs in different pharmaceutical forms, derived from modernized pharmaceutical formulation technology,

have emerged and developed. For examples, various bioactive natural molecules from TCM, such as curcumin, quercetin, and trans-resveratrol, can be loaded into nanocarriers for improving drug delivery.

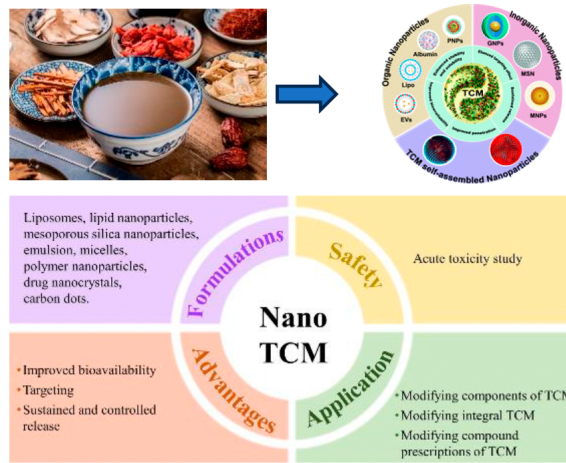


Figure 3: Innovative TCM medication forms: Nanocarriers

Ginseng has received approval as a new resource food in China and has underwent a substantial commercial development, occupying a prominent position in the list of best-selling. Different ginseng commercial products, such as Ginseng fermented wine, ginseng polysaccharide beverage, and ginseng gummies appear in the market by incorporating with modern food technology, with not only can the flavor and edible value of hawthorn-infused food be enhanced, but also individuals' nutritional and health requirements can be fulfilled.



Figure 4: Ginseng products in modern era

Furthermore, acupuncture as a therapeutic intervention is widely practiced in China and worldwide. US-FDA reclassified acupuncture needle as “Medical device” in 1996. As an integrative or complementary therapy with increasingly accumulated evidence in alleviating adult post-operative pain, post-operative

dental pain, nausea and vomiting, recent biomedical research uncovers some biological mechanisms underlying the therapeutic effects of acupuncture interventions, in which, for instance, acupuncture could trigger anti-inflammatory response against intensive cytokine storm by activating specific signal pathways. Moreover, the advent and proliferation of electro-acupuncture therapy apparatus within medical institutions across China is attributed to its capacity for facile, expeditious, and precise acupoint stimulation. This technological innovation facilitates the provision of automated and exacting therapeutic interventions for patients. In short, TCM has undergone a process of technological evolution in its healthcare and therapeutic modalities in the past few decades, thereby aligning its practices with the contemporary medical care.

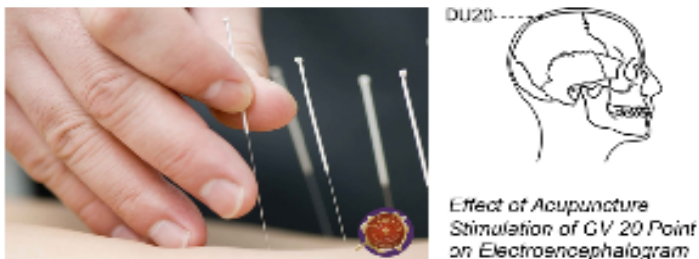


Figure 5: Acupuncture and DU20 Acupuncture point

3. Imperial Court Medicine in the Qing Dynasty

During the Qing Dynasty, a specialized branch of TCM known as "Imperial Court Medicine" was found inside the Forbidden City where the royal families resided. Imperial court medicine utilized TCM concepts and practices, and provides specifically designed medical and healthcare service with the essential characteristics of TCM for members of the imperial court. Within this authoritarian Chinese civilization, the imperial court established medical institutes known as "Imperial Medical Institutions", with the exclusive purpose of providing healthcare solely to the imperial court. As an imperial medical agency, it experienced significant expansion and gradual growth in the early Qing Dynasty, establishing multi-functional goals. Its responsibilities were not only to provide healthcare and medical services to the emperor and his family, but organizing medical treatments and records of the imperial court had also become its additional scope of responsibility. The

imperial physicians were stringently selected from different cities throughout the whole country. The selected imperial physicians usually were renowned for their exceptional medical expertise, with exemplified the highest levels of medical knowledge and competence in clinical practice in their hometowns. For example, Wu Qian held the official title of an imperial physician in the early Qing Dynasty and served as an assistant administrator at the Imperial Medicine Institution, where he participated in the production of the Golden Mirror of Medicine (醫宗金鑑), which fully documented his clinical practice records on Emperor Qian Long. The special benefits of Imperial Court Medicine in the Qing Dynasty will be further discussed in the following sections, along with references to specific medical archives from that period, including formulas, prescriptions, and medical records.



Figure 6: TCM book in Qing Dynasty: Golden Mirror of Medicine (醫宗金鑑)

3.1. The medications in the Qing Dynasty under the imperial court system

Medication played a pivotal role in the diagnostic and treatment during the Qing Dynasty. The imperial medical system was underpinned by a meticulously structured management framework, which aimed to guarantee an uninterrupted provision of premium-quality medicinal substances and preparations. This involved the systematic procurement of medicinal resources from diverse provinces and ethnic constituencies throughout the whole country, the acquisition of medical donations from foreign dignitaries, and the autonomous production of medicinal materials by the Imperial Medical Institutions. Such a robust supply chain infrastructure facilitated the consistent distribution of a broad spectrum of

medications. These medicinal materials were mainly deployed for the treatment of various maladies, the prevention of epidemic outbreaks, and the enhancement of longevity among the imperial elite.

The "Spindle Medication" (錠子藥) represents a distinctive pharmaceutical innovation in the Qing Dynasty's imperial court, characterized by its unique spindle shape. It was produced by meticulously grinding various herbal ingredients into a fine powder, followed by mixing them in an appropriate binding reagent to form the medication. Predominantly, this medication was used for the prophylaxis and treatment of heat stroke and infectious diseases, embodying the intricate cultural values of the court. The elaborate production methodology entailed precise subdivision of herbal ingredients, the addition of suitable adhesives, and thorough mixing. Subsequent procedures included meticulous box packing, ornamental painting, the affixing of silk threads, and the crafting of tassels, culminating in a product that was not only effective against the pervasive infectious diseases of the hot, humid summer months but also aesthetically aligned with the court's cultural ethos.

According to TCM concepts, infectious diseases are attributed to the incursion of external pathogens via the respiratory system, which in turn disrupts the equilibrium of Yin and Yang. The seminal TCM classic, the "Inner Canon of Huangdi (黃帝內經)," provides a comprehensive framework for disease prevention and management, advocating for anticipatory measures and early intervention in disease pathogenic processes. This philosophical approach to health is exemplified by an event in April of the eleventh year of Emperor Yongzheng's reign (1733), when Emperor Yongzheng bestowed Spindle Medication upon six military encampments. This act was not only a gesture of care but also a strategy to mitigate the effects of heat-induced ailments such as sores and carbuncles, as well as to expedite wound healing on the battlefield. An exemplary formulation from the annals of Spindle medications is "Zijin Ding (紫金錠)", renowned for its efficacy in ameliorating conditions such as heat stroke, abdominal distension and pain, as well as nausea and vomiting. Historical accounts record an instance where Emperor Guangxu, afflicted with cutaneous erythema and tumefaction due to oppressive thermal conditions, and consequently experienced symptomatic relief after being treated with Zijin Ding. In the modern era, the spindle medication of Zijin Ding is still currently in used for pyretic illnesses and is officially documented in the Pharmacopoeia of the People's Republic of China. Hence, spindle medicine represents

a distinctive pharmaceutical innovation in the Qing Dynasty, offering therapeutic benefits for both infectious diseases and possessing noteworthy aesthetic value.



Figure 7: Spindle medications of "Zijin Ding"(紫金錠)

3.2. Famous Classical TCM Formulas in Qing Dynasty's Imperial Court

The term "Famous Classical Formulas" refers to a collection of TCM prescriptions meticulously recorded in the medical annals before and throughout the Qing Dynasty, and that are still extensively used in contemporary clinical practice in China. The extensive use of these TCM formulas in the current national health and medical system has provided a vast amount of accumulated data and evidence to support the therapeutic efficacy and safety of these TCM formulas. The enduring use of these formulas is supported by a substantial body of historical empirical evidence, which substantiates their potential to offer therapeutic benefit while mitigating risk, thus providing a dual assurance of safety and efficacy. To address the multifaceted medical exigencies of contemporary society and to perpetuate the advancement of human health, it is imperative to foster the integration and modernization of Famous Classical Formulas. These adaptations are crucial for manufacturing healthcare products with portable and user-friendly consumption features. In 2018, a collaborative initiative between the China Administration of Traditional Chinese Medicine and the State Administration for Drug Administration resulted in the development of the "Catalogue of Ancient Classic Prescriptions (First Batch)," which was subsequently disseminated to the general public. This first compendium encompasses an assemblage of 100 premier TCM

prescriptions, tracing their origins back to the Han Dynasty and spanning across six dynastic eras. Moreover, it incorporates seminal contributions from 37 ancient medical texts, including but not limited to the "Synopsis of the Golden Chamber (醫宗金鑑)" and "Treatise on Febrile Diseases (温病条辨)".

The Qing Dynasty is acknowledged as a golden epoch in the flourishing and advancement of TCM and the distinct medical practices of the imperial court. Numerous TCM prescriptions either originated from or were refined during this period, such as the Qinggong Shoutao Pill, which was esteemed for their life-prolonging effect among the emperors. This discourse aims to delve into the Qing Dynasty's imperial court medicine, focusing on the further development and improvement of these renowned famous classical TCM formulas, particularly through individualization and meticulous refinement. The Qing Dynasty's imperial physicians emphasized on the pursuit of adopting precise therapeutic treatment plans for each individual patient. In cases where the royal family in imperial court suffered from different diseases, the imperial physicians would prioritize strategies to maximize the efficaciousness of medical interventions, by tailoring treatment plans to address the specific needs of each patient. The Qing Dynasty's imperial physicians also engage in meticulous customization of TCM formulations in order to demonstrate a commitment to the personalization of healthcare strategy.

A case in point involves the treatment of Empress Dowager Cixi, who was treated with a modified Ling-gui-zhu-gan Decoction (苓桂朮甘汤) to address her visceral dysfunctions. On the fifth day of October in the 34th year of Emperor Guangxu's reign, an imperial physician diagnosed Empress Dowager Cixi. By pulse diagnosis, Empress Dowager Cixi was found with frailty attributable to her venerable age and exhibited clinical manifestations indicative of *qi* deficiency and organ impairment. The physician then utilized the Famous Classical Formula of Ling-gui-zhu-gan Decoction, renowned for its yang-warming and qi-supplementing capacities, adroitly adding *Prepared Common Monkshood Daughter Root* and *Glutinous Rice* to fortify the kidneys and stomach while dispelling pathogenic cold. The imperial physicians judiciously integrated additional botanical ingredients to refine the original formula and to maximize the concoction's restorative effect. This modification of the TCM formula yielded satisfactory therapeutic outcomes on Empress Dowager Cixi's visual condition.

The Qing Dynasty also witnessed the innovative contributions to the further advancement of Famous Classical Formulas by the esteemed physician Wu Tang, who was known for his expertise in managing "warm diseases" – a category of infec-

tious diseases attributed to the incursion of external pathogens. During Emperor Qianlong's reign, Wu Tang received imperial commission to address an epidemic and conducted an exhaustive research of ancient medical classics, as well as the contemporary scholarly discourse on warm diseases. Through his in-depth studies of his own and other clinical experiences, Wu Tang composed the seminal work "Differentiation of Warm Disease Treatments" (溫病條辨), documenting numerous TCM prescriptions in Qing Dynasty such as the San-jia-fu-mai Decoction (三甲復脈湯), the Sha-Shen-Mai-Dong Decoction (沙參麥冬湯), and the Yi-Wei Decoction (益胃湯) and has become an authoritative reference in current TCM education and medical service. These TCM prescriptions are also listed as famous classical TCM formulas by the State Administration for Drug Administration in China. The enduring legacy of Wu Tang's contributions is evidenced by the continuous use of these TCM formulas throughout the history and within the contemporary medical and health system in China. The therapeutic value and composition of a few selected representative famous classical TCM formulas are highlighted in Table 1.

Table 1: Representative famous classical TCM formulas in Qing Dynasty

TCM Formula Name (in Chinese)	Traditional Therapeutic Indication	Composition of Herb
Xiao-Cheng-Qi Decoction (小承氣湯)	To relieve heat accumulation by mild effect	Rhubarb Tangute Rhubarb Official Magnolia Bark Immature Bitter Orange
San-Jia-Fu-Mai Decoction (三甲復脈湯)	To nourish Yin, and extinguish wind	Liquorice Root Adhesive Rehmannia Root Tuber White Peony Root Dwarf Lilyturf Root Tuber Ass-hide Gelatin Hemp Fruit Common Oyster Shell Turtle Carapace Tortoise's Carapae and Plastron
Sha-Shen-Mai-Dong Decoction (沙參麥冬湯)	To clear and nourish the lungs and stomach	Coastal Glehnia Root Fragrant Solomonseal Rhizome Liquorice Root Mulberry Leaf Dwarf Lilyturf Root Tuber Hyacinth Bean Snakegourd Root
Sang-Xing Decoction (桑 杏湯)	To nourish the lung to arrest cough	Ansu Apricot Seed Coastal Glehnia Root Fritillary Bulb Fermented Soybean Mulberry Leaf Common Gardenia Fruit Pear Skin

TCM Formula Name (in Chinese)	Traditional Therapeutic Indication	Composition of Herb
Yi-Wei Decoction (益胃汤)	To nourish stomach-yin	Coastal Glehnia Root Dwarf Lilyturf Root Tuber Adhesive Rehmannia Root Tuber Fragrant Solomonseal Rhizome

In summary, the famous classical TCM formulas epitomize the profound clinical values, possessed by the imperial physicians of the Qing Dynasty, providing an invaluable repository of empirical knowledge, serving as a source of inspiration and a pivotal reference point for contemporary research and practice in TCM.

4. Emperors' reliance on Imperial Court Medicine for health preservation

As an institution expressly dedicated to the health care of the emperor and the royal lineage, the imperial physicians of the Qing Dynasty executed systematic physical assessments, medicated diets, physical exercise, and the health maintenance methods. Throughout the Qing Dynasty, the medical practices instituted in the imperial court aim at guaranteeing the vitality and longevity of the emperors.

Emperor Qianlong, who reigned from 1711 to 1799 and was the longest-lived monarch in Chinese history, attributed his longevity to a meticulously curated regimen of health preservation. As documented in the "Yellow Emperor's Canon (黄帝内经)," a fundamental interdependence between mental and physical health is existed, which was implemented by Emperor Qianlong. Further, he diligently adhered to the principles of TCM that advocate nutritional equilibrium and physiological functions modulation. He also expressed a preference for foods which have high content in vegetable protein and phytoestrogens, such as legumes and Chinese tofu. According to the "Compendium of Materia Medica (本草纲目)," these foods were consumed to strengthen his blood and Qi (vital energy).

Empress Dowager Cixi relied on the sophisticated medical practices of the imperial court for her recuperation, both mentally and physically. Historical records from the Qing Dynasty reveal that the Empress Dowager drank jasmine or rose tea postprandially, a practice believed to ameliorate hepatic function, enhance hemodynamic flow, and establish systemic equilibrium. Complementary physical therapeutic interventions were also employed, including but not limited to massage, acupuncture, and moxibustion, all intended to facilitate the regulation of Qi and vascular circulation within her constitution. Significantly, the selection of

acupoints such as Tongli (HT 5) and Baihui (GV 20) was intentional, as these are known to possess analogous benefits in terms of mental tranquility and neural regulation, thereby precluding the onset of neurasthenia.

In brief, the medical practices of the Qing Dynasty's imperial court were characterized by a highly personalized and comprehensive approach to healthcare, which was afforded to emperors and other members of the imperial court, with several features and advantages, notably the utilization of medicinal substances of the highest quality and professional healthcare methods.

5. Medicated Diet

The concept of the Medicated Diet is integral to the paradigms of health maintenance and senescence mitigation within both TCM and Qing Dynasty imperial court medicinal practices. TCM dictates that dietary composition for health preservation should be tailored and followed the theory of the "five flavours," which guides the categorization and application of nutritional therapeutics. These flavours – sour, bitter, sweet, pungent (often referred to as spicy), and salty – concisely encapsulate the essential characteristics and pharmacological actions of comestibles. Notably, the sweet flavor is commonly use in the imperial court tonics, due to its reputed capacity to ameliorate and harmonize.

Medicinal practices in the Qing Dynasty's imperial court not only assimilated conventional dietary therapeutic approaches but also accentuated their potential effect in healthy life extension. This was evidenced by the use of specialized foods and beverages, which were particularly designed to accommodate the health and longevity aspirations of the emperors. This segment undertakes an examination of the dietary philosophies and methodologies encapsulated in TCM and Qing Dynasty imperial medicine, with also provides an analytical discourse on two exemplars from Qing Dynasty: the Baxian cake and the Songling wine. These edible items are emblematic of the interplay between nutritional artistry and medicinal insight, recognized for their attributed benefits in promoting longevity.

5.1. Medicated Diets in TCM

Within the domain of TCM, a myriad of natural substances was recognized for their bifunctional capacity, simultaneously contributing to both alimentary sustenance and the amelioration of health conditions. They were based on the TCM concept of "the common origin of food and medicine," which explains the

role of numerous substances with both nutritive and curative effects. TCM categorizes foods based on their properties such as thermal energy (characterized as warming, cooling, or neutral), flavours (encompassing sweet, sour, bitter, salty, and pungent flavours), and organ system associations. For instance, *Zingiber officinale* (ginger) is attributed with warming properties which is prevalently utilized to enhance gastrointestinal function, and *Lycium barbarum* (goji berries) is reputed for its ability to fortify hepatic and renal systems while also purportedly improving ocular health.

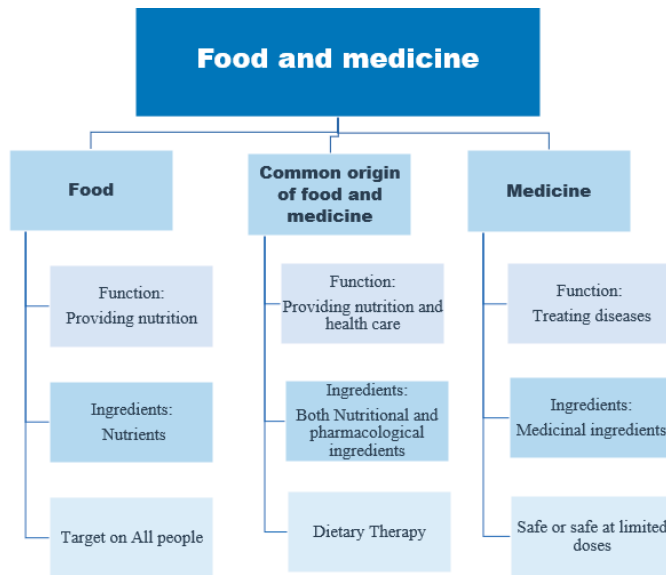


Figure 8: Common Origin of Food and Medicine

The dietary principles of TCM assert that botanicals and nutritional entities share a unified origin and analogous application methods. They are employed either as standalone agents or in concert with other botanical or culinary ingredients to create a varied gamut of dietary prescriptions. Table 2 compiles an inventory of botanicals commonly integrated into the nutritional strategies of TCM, along with their respective effects within TCM's conceptual frameworks.

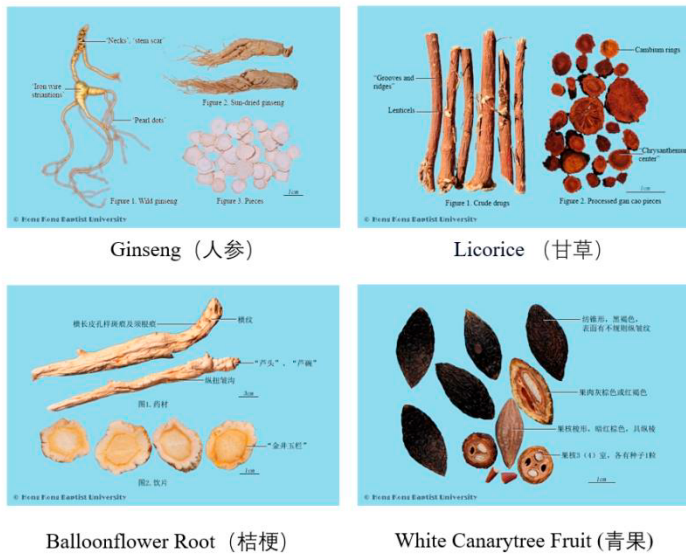


Figure 9: Four representative " the common origin of food and medicine " used in TCM medicated diets

Table 2 – Representative " the common origin of food and medicine " used in TCM medicated diets

Plant name	Traditional Therapeutic Functions	Current Pharmacological Effects	Reference
Licorice (<i>Glycyrrhiza uralensis</i>)	· nourishing Yin · tonifying Qi · promoting blood circulation	Anti-inflammatory and anti-allergic activity	Shennong Bencaojing Jizhu (神农本草经集注)
Honey (<i>Melvita</i>)	· clearing heat · tonifying the middle · relieving pain	Anti-oxygenic activity and anti-microbial activity	Shennong's Classic of Materia Medica (神农本草经)
White Canarytree Fruit (<i>Canarii Fructus</i>)	· clearing heat · promoting fluid production · moistening dryness	Lowering blood glucose level and blood fat level	Compendium of Materia Medica (本草纲目)
Chrysanthemum (<i>Flos Chrysanthemi</i>)	· dispelling wind · clearing heat · calming the liver · brightening the eyes	Promoting cholesterol metabolism, improve myocardial ischemia, and protecting blood vessels	Compendium of Materia Medica (本草纲目)
Indian Buead Tuckahoe (<i>Poria</i>)	· strengthening the spleen · calming the heart · calming the mind	Improving gastrointestinal barrier function	Bencaoxinbian (本草新编)
Ginseng Root (<i>Ginseng Radix et Rhizoma</i>)	· tonifying vital energy · tonifying the spleen and the lungs	Antioxidant and immune regulating	Shennong's Classic of Materia Medica (神农本草经)

5.2. Medicated Diet in Qing Dynasty

Medicated diet is conceived under TCM theoretical principles, which is not merely a source of nutritious foods but also for a way of disease prevention and treatment, health maintenance, and life extension. Medicated diet constitutes a salient component of the TCM and imperial court medicine. According to TCM precepts, medicated diet encompasses alimentary items that intrinsically and holistically bolster physiological vigor, forestall and remedy ailments, and promote longevity. This necessitates the judicious selection of dietary components and the formulation of recipes that are tailored to individual constitutional needs, taking into account variables such as age, sex, climatic conditions, geographical location, and other environmental contingencies. Diverging from the medicinal practices of preceding eras, the Qing Dynasty sovereigns exhibited a pronounced preference for medicated diets over mineral-based medicinal concoctions. This discourse will delve into two emblematic medicated diet exemplars from the Qing Dynasty: the Baxian cake and the Songling wine. We will explain their constituent ingredients, their intended functions and therapeutic impacts, as well as their relevance and application in contemporary health practices.



Figure 10: The Baxian Cake and Medical Wine

5.2.1. Representative food: *The Baxian cake*

The Baxian cake, named in Mandarin as "Ba Xian Gao" and colloquially known in English as the "Eight Immortals cake," constitutes a traditional culinary preparation with medicinal virtues, which garnered considerable acclaim during the Qing Dynasty epoch. The nomenclature "Baxian" originates from the revered "Eight Immortals" of Chinese mythology – each figure representing different extraordi-

nary abilities and symbolizing different aspects of well-being and longevity. This gastronomic concoction was not merely a confection but an embodiment of the cultural and health-promoting ideologies of the time, integrating the mythological significance of the Eight Immortals with the empirical pursuit of wellness through dietary means. The ingredients of the Baxian cake were carefully selected for their health benefits according to TCM principles. While the exact recipe might have varied, it typically included a combination of eight main herbal ingredients, which correspond to the Eight Immortals, and are believed to harmoniously promote health and longevity.

These ingredients included: Lingzhi Mushroom (*Ganoderma lucidum*), Ginseng (*Panax ginseng*), Goji Berries (*Lycium barbarum*), Astragalus Root (*Astragalus membranaceus*), Jujube Dates (*Ziziphus jujuba*), Lotus Seeds (*Nelumbo nucifera*), Longan Fruit (*Dimocarpus longan*), and Polygonatum (*Solomon's Seal*), strategically designed to aid for the equilibrium of the body's Yin and Yang within TCM philosophy. Moreover, it aimed to facilitate the unobstructed circulation of Qi, the vital life force proposed by TCM to course through the body's meridians, and to sustain the concordance of the various organ systems, thereby ensuring holistic well-being.

In contemporary times, the Baxian cake has undergone a significant evolution, predominantly serving a population with compromised digestive efficacy. This adaptation underscores a responsive alignment with the prevailing health requisites of the populace. It furnishes an archetypal impetus for the genesis of functional foodstuffs, drawing inspiration from the Qing Dynasty's imperial Medicated Diet.

5.2.2. Representative drinks: Songling Wine

The medical wine of the Qing Dynasty had the effect of tonifying and prolonging life, and was highly praised by the emperors. This effect was not only due to the significant therapeutic effect of the medical wine, but also the good taste, fragrant aroma, and suitability for long-term consumption. Taking medical wine to supplement and prolong life was one of the major features of imperial court medical treatment in Qing Dynasty. Emperor Qianlong used many kinds of medical wine to prolong his life. Songling wine was a medical wine that Emperor Qianlong liked to drink very much. It was made from many herbs, including *Adhesive Rehmannia Root Tuber*, *Chinese Angelica*, *Safflower*, *Wolfberry Fruit* and more than 10 other kinds. It had the effect of invigorating spleen and Qi, nourishing blood, and extending the emperor's longevity. In the modern era, the manufacturing of

medical wine not only inherits traditional production experience, but also draws on modern science and technology, making the production of medicinal liquor tend to standardized. To enhance quality control, the standardization of medical wine has also been listed as an important content in the Chinese Pharmacopoeia.

6. Anti-Aging strategies of TCM and Imperial Court Medicine

Aging is an inevitable and inherent biological phenomenon that causes the progressive diminution of physiological capabilities and augments the susceptibility to pathologies. This process poses a serious challenge to the health and vitality of populations globally, engendering a burgeoning imperative for the development of interventions aimed at decelerating the senescence trajectory and fortifying health conservation. Within the framework of TCM, aging is acknowledged as a constant companion throughout the human life cycle. The diminishment of congenital vigor, coupled with the discordance of acquired adaptative mechanisms, culminates in the gradual dispersion of vital essence. This loss is implicated in the functional impairments and the morphological alterations that characterize the aging process. TCM has made substantive contributions to the discourse on senescence mitigation, accumulating a vast repository of knowledge and practices focused on health preservation and the slowing of aging.

6.1. Use of TCM in Anti-Aging

TCM has a profound comprehension and an extensive repository of knowledge regarding the mitigation of senescence and consists of two main two principal theoretical frameworks that explicate the mechanisms of aging: the theory of deficiency and the theory of Qi. The theory of deficiency suggests that the etiology of senescence is predominantly rooted in deficiencies within the renal and splenic systems, or a combined insufficiency of both spleen and kidney energies. It is postulated that these deficiencies are the underlying pathogenic factors contributing to the aging process. On the other hand, the theory of qi contends that the vitality and circulation of blood within the human body are driven by the energetic force known as "Qi". An impediment to the smooth and efficacious flow of qi is believed to result in inadequate nourishment to the body, negatively affecting life functions and speeding up the aging process.

In response to these theories, TCM employs a multifaceted therapeutic approach aimed at invigorating and replenishing Qi and blood, nourishing yin

and tonifying yang. Such interventions are strategically designed to decelerate the progression of aging and extend the human lifespan, thus enhancing the vitality and longevity of individuals. The anti-aging strategy in TCM theory is predicated upon the utilization of herbs which can be categorized into discrete medicinal entities and composite herbal formulas. Single medicinal agents comprise botanicals that exhibit targeted efficacy in ameliorating senescence, including, but not limited to, *Panax ginseng*, *Polygonum multiflorum*, *Ginkgo biloba*, *Cordyceps sinensis*, *Astragalus membranaceus*, and *Ganoderma lucidum*. These pharmacologically active plants are purported to modulate and enhance various physiological functions such as gonadal regulation, nucleic acid metabolism, free radical neutralization, and trace element equilibrium in the body, all of which bear relevance to the aging continuum.

In contrast, TCM formulas are composed of a confluence of multiple herbs that work cooperatively to exert synergistic and complementary effects on senescence, which strategically designed to strengthen Qi, blood, yin, and yang, as well as nourish the functional capacities of the internal organs. These integrative TCM prescriptions are believed to provide a holistic approach to mitigating the multifactorial process of aging. Table 3 shows some examples of the commonly used herbs in TCM for anti-aging, and their corresponding biological functions.

Table 3 - Commonly used herbals in TCM for anti-aging

Mechanism of Action (Based on TCM theory)	Commonly Used Herbs
replenish Qi	<i>Radix et Rhizoma Ginseng</i> , <i>Radix Codonopsis</i> , <i>Radix Pseudostellariae</i> , <i>Radix Astragali</i> , <i>Rhizoma Atractylodis Macrocephalae</i> , <i>Rhizoma Diossoreae</i> , <i>Poria</i> , <i>Semen Coicis</i> , <i>Radix et Rhizoma Glycyrrhizae</i> , and <i>Fructus Jujubae</i>
nourish blood	<i>Radix Angelicae Sinensis</i> , <i>Radix Rehmanniae Praeparata</i> , <i>Radix Polygoni Multiflori Pareparata</i> , <i>Colla Corii Asini</i> , <i>Mori Fructus</i> , and <i>Arillus Longan</i>
replenish yin	<i>Radix Glehniae</i> , <i>Radix Adenophorae</i> , <i>Radix Ophiopogonis</i> , <i>Herba Dendrobii</i> , <i>Fructus Lycii</i> , <i>Rhizoma Polygonati</i> , <i>Fructus Ligustri Lucidi</i> , <i>Rhizoma Polygonati Odorati</i> and <i>Tremella</i>
reinforce yang	<i>Cornu Cervi Pantotrichum</i> , <i>Cordyceps</i> , <i>Herba Epimedii</i> , <i>Radix Morindae Officinalis</i> , <i>Herba Cistanche</i> , <i>Eucommiae Cortex</i> , and <i>Semen Cuscutae</i>

6.2. “Qingong Shoutao” Pill: modern embodiment of Qing Dynasty

A multitude of products and health maintenance paradigms rooted in TCM have undergone a transformative adaptation for contemporary application, leveraging the extensive legacy of practices cultivated during the Qing Dynasty era. Among them, “Qingong Shoutao Pill”, a Chinese herbal medication that has

received approval from the China National Medical Products Administration (formerly known as the China FDA), is a modern pharmaceutical product rooted in herbal formula in Qing Dynasty, which is used in China to treat individuals who suffers from dizziness and fatigue, memory decline, and soreness in the waist and knees, with its primary function is to nourish the kidney. It is composed of more than ten TCM ingredients, including *Sharpleaf Galangal Fruit*, *Adhesive Rehmannia Root Tuber*, *Babury Wolfberry Fruit*, *Asparagus cochinchinensis* and the others. The herbs in Qinggong Shoutao Pill and its pharmacological mechanisms of actions were listed in Table 4. The majority of these ingredients exhibit properties conducive to the fortification of visceral organ systems as well as possessing protective functionalities, yielding a formulation that is harmoniously balanced, thereby facilitating the objective of life extension. Among all herbs in Qinggong Shoutao Pill, the *Sharpleaf Galangal Fruit* (益智仁, *Alpinia oxyphylla*), possesses a historical precedent of utilization within traditional Chinese medicinal formulations aimed at ameliorating cerebrally-oriented dysfunctions, including memory deterioration and learning impairments, and has been identified as a key component in Qinggong Shoutao Pill.

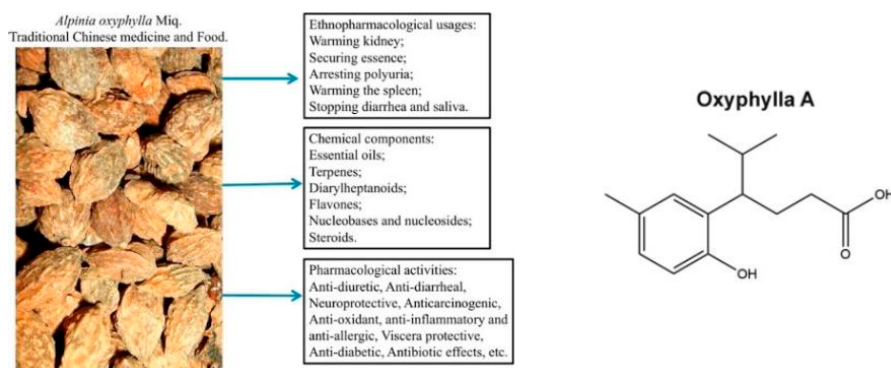


Figure 11: Sharpleaf Galangal Fruit (益智仁) and Oxyphylla A (益智素)

According to the theoretical concept of TCM, *Alpinia oxyphylla* is revered for its capacity to augment yang, thus contributing to the overall vitality and longevity. Recent studies have demonstrated its significant neuroprotective effects in different scientific experiments. For example, oxyphylla A, a novel bioactive constituent isolated from *Alpinia oxyphylla*, has been demonstrated potential in mitigating cognitive impairments and modifying neuropathological outcomes

through the modulation of the Akt-GSK3 β signaling cascade and the Nrf2-Keap1-HO-1 axis within both in vitro and in vivo murine Alzheimer's disease models. Additionally, oxyphylla A facilitates the proteolytic breakdown of α -synuclein, thereby conferring neuroprotection, with an effect attributed to the activation of the immunoproteasome.

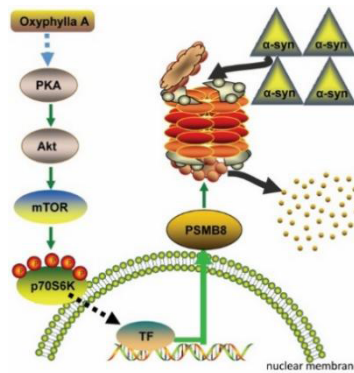


Figure 12: Oxyphylla A Promotes Degradation of α -Synuclein for Neuroprotection via Activation of Immunoproteasome

Complementary to these findings, a series of scientific researches have yielded further evidence supporting the Qinggongshoutao Pill's specialized in geroprotective properties and its therapeutic efficacy in addressing age-related medical conditions in the elderly cohort. Notably, this treatment has been scientifically demonstrated to significantly enhance cognitive function for individuals in the preliminary phase of Alzheimer's disease (AD).

Presently, the Qinggong Shoutao Pill, unearthed by Chen Keji in the 1980s from the archival medicinal annals of the Qing Dynasty, received authorization for production by the Tianjin Pharmaceutical Group's Jinyao Darentang in China in the year of 1987. The name of the formulation ostensibly reflects the ascribed therapeutic virtues, with the term "Shou Tao" frequently symbolizing longevity in traditional Chinese culture, thereby suggesting an intrinsic association with the promotion of extended lifespan and vitality. Furthermore, the Qinggong Shoutao Pill have earned recognition as a part of China's national intangible cultural heritage, reflecting the profound value and historical significance attributed to such traditional medicinal practices within the sphere of Chinese cultural preservation.

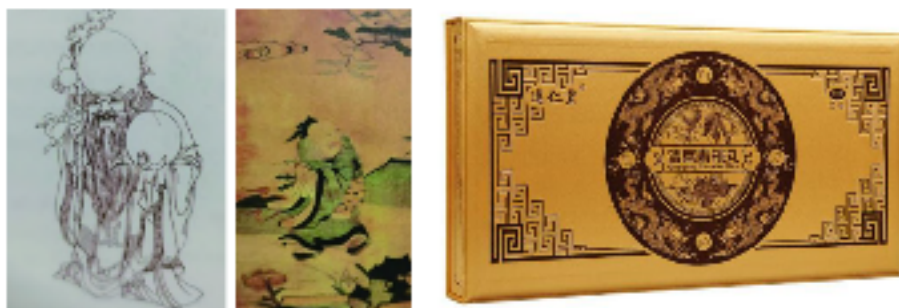


Figure 13: "Shou Tao" in Chinese Culture and "Qinggong Shoutao Pill" produced by Darentang

Table 4 - Components in Qinggong Shoutao Pill

Herb Name	Current Pharmacological Activity	Current Pharmacological Mechanism of Action
Chinese Angelica (<i>Angelicae Sinensis Radix</i>)	· Antioxidant	· Increasing the activity of superoxide dismutase and glutathione peroxidase · reduce lipid peroxidation levels
Sharpleaf Galangal Fruit (<i>Alpiniae Oxyphyllae Fructus</i>)	· Neuroprotection	· Activating phosphatidylinositol 3-kinase/protein kinase B pathway on β -Protective effect of amyloid protein or local ischemia on nerve cell damage
Ginseng Root (<i>Ginseng Radix et Rhizoma</i>)	· Neuroprotection	· Inhibiting neuronal apoptosis and alleviate cerebral ischemia-reperfusion injury
Spine Date Seed (<i>Ziziphi Spinosae Semen</i>)	· Improving memory function	· Improving the learning and memory abilities of chlorophenylalanine induced insomnia model rats
Adhesive Rehmannia Root Tuber (<i>Rehmanniae Radix</i>)	· Neuroprotection	· Inhibiting cell apoptosis by inhibiting the activity of nitric oxide synthase and Bax protein

7. Strategic framework for the sustainable development of Imperial Court Medicine

Imperial Court Medicine, an esteemed asset within TCM, is distinguished by a myriad of distinctive attributes and innovative contributions, while simultaneously preserving the extensive therapeutic advantages inherent in TCM practices. The medicinal formulations developed during the Qing Dynasty for the Imperial Court hold potential for adaptation into modern health maintenance entities, which are poised to confer benefits to public health and bolster the progression of TCM therapeutic practices.

A comprehensive exploration of Qing Dynasty classical literature, encompassing medical texts, pharmacopoeias, and clinical annals, is essential for further product development and research. Delving into the foundational theories, diagnostic strategies, and therapeutic tenets, as well as the intricate composition and practical deployment of these ancient prescriptions, is critical to the informed development of modern health preservation products. Using these historic TCM formulas as a cornerstone, the modernization and innovation of TCM are being advanced through the integration of contemporary scientific methodologies and technological advancements.

In the current era, a primary objective of TCM research is to decode and leverage the fundamental therapeutic mechanisms underpinning the discipline, predicated on an array of medicinal herbs and therapeutic modalities. For example, the recent establishment of a network pharmacology approach has facilitated the elucidation of the quintessential TCM treatment paradigms, conceptualized as the topological interplay between disease symptomatology and the molecular targets of TCM herbal constituents within the human protein interactome. By constructing network modules associated with specific symptoms and assessing the proximity of an herb's molecular targets to these symptom modules, the potential therapeutic efficacy of the herb in treating the symptom can be postulated with greater precision.

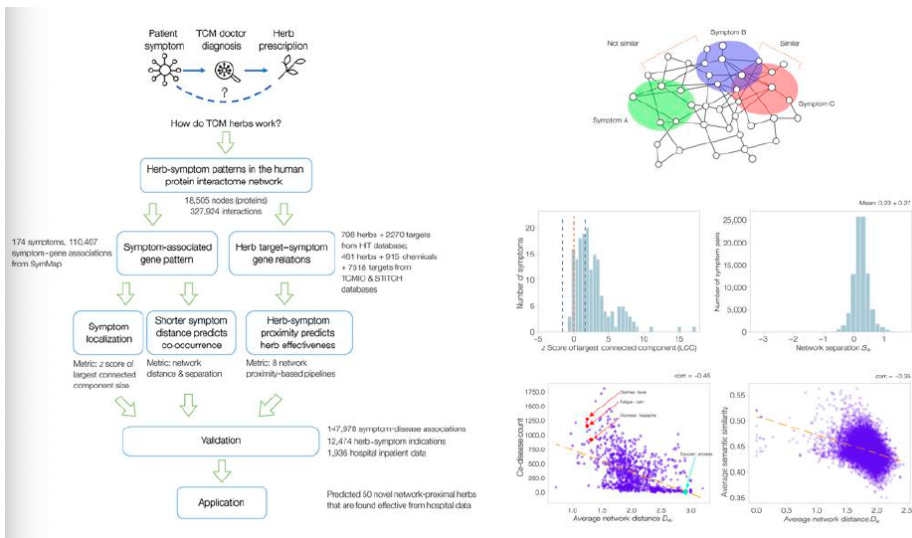


Figure 15: Network medicine framework reveals generic herb-symptom effectiveness of traditional Chinese medicine

The transformation of a TCM prescription into a commercially viable product is an intricate undertaking that necessitates an integrative approach synthesizing ancestral medicinal wisdom with modern scientific methodologies and regulatory protocols. Paramount to this endeavor is the stringent assurance of the resultant product's therapeutic efficacy, safety profile, and manufacturing quality. Concurrently, it is essential to uphold the veneration for the indigenous origins and historical context from which the TCM formulation is derived. The Lianhuaqingwen (LH) capsules are one of the repurposed commercial Chinese herbal formulations, has demonstrated efficacy in the treatment of influenza. A prospective, multicenter, open-label randomized controlled trial was conducted to evaluate the therapeutic potential of LH capsules in patients with laboratory-confirmed COVID-19 infection. Strict monitoring procedures were implemented to record adherence to the prescribed study medication regimen, clinical outcomes, the administration of concomitant medications, and the occurrence of adverse events. Detailed documentation encompassed the onset, intensity, duration, and management of adverse events, as well as their subsequent outcomes, facilitating the assessment of causality related to the study medication. Considering the compiled safety and efficacy data, LH capsules may be posited as a therapeutic option to mitigate the clinical picture of COVID-19. The standardization and productization of TCM prescriptions represent a pivotal advancement in the field of complementary and alternative medicine, as well as in the overarching sphere of international health services. This transition facilitates the integration of empirical, time-honored wisdom with contemporary pharmaceutical protocols, thereby underscoring the potential of TCM to contribute substantively to a diverse therapeutic landscape.



Figure 16: Lianhuaqingwen (LH) capsules: Chinese herbal medicine repurposed for COVID-19 pandemic

Conclusion

Imperial court medicine, as a repository of millennia of empirical clinical practice, forms an invaluable legacy in the history of TCM. The TCM formulas and medicated diets were the privilege of emperors during the Qing Dynasty, not only contributed to the maintenance of imperial vitality in antiquity but continue to provide salutary benefits to the people in modern society. The authorities of China have enacted a series of legislative measures aimed at fostering the development and perpetuation of TCM's rich heritage. It is the aspiration that the profound insights of TCM may confer health and longevity benefits on a global scale, improving the well-being of humanity. Furthermore, it is expected that a growing global awareness will emerge, acknowledging and embracing the profound contributions of TCM to holistic health practices.

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