A Cognitive Study of the Naming of Chinese Herbal Medicines in the Vegetable and Fruit Sections of the *Compendium of Materia Medica*

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Abstract

Chinese herbal medicine, as a core part of traditional Chinese medicine, has names that not only carry deep historical significance but also reflect humanity's profound understanding of the characteristics and effects of these herbs. This study focuses on the naming of 55 herbal medicines from the vegetable and fruit sections of the *The Compendium of Materia Medica*, aiming to uncover the cognitive mechanisms behind these names. The research found that 42 of the herbal medicines in the vegetable and fruit sections were named based on single motivation, while 13 were named based on a combination of motivations. In the single-motivation naming pattern, the highest proportion was based on shape, followed by factors like origin and morphology. Among the combined motivations, the most common combinations were origin and flavor, followed by growth environment with shape, shape and flavor, and shape and color. The study reveals that whether naming based on a single characteristic or integrating multiple characteristics, the naming process emphasizes easily recognizable and perceivable features to represent the whole. This reflects the metonymy of

concepts in the naming of herbal medicines. When a single feature isn't enough to define the herb, people tend to integrate multiple features in the naming process, showing the commonality of conceptual integration in the naming of Chinese herbal medicines. Moreover, people often use familiar entities and their similarities in shape or efficacy to name the herbs, highlighting the influence of conceptual metaphors in the naming of Chinese herbal medicine. This research can deepen understanding of the value and characteristics of Chinese herbal medicines and better promote the internationalization of traditional Chinese medicine.

Keywords: Nomenclature of Chinese herbal medicines, Conceptual metonymy, Conceptual integration, Conceptual metaphor

1. Introduction

In 2012, the National Administration of Traditional Chinese Medicine (NATCM) issued the "12th Five-Year Plan for the Construction of Traditional Chinese Medicine Culture", emphasizing the need to deeply explore, organize, and study the connotations and core concepts of traditional Chinese medicine culture, as well as to effectively protect and inherit the intangible cultural heritage of traditional Chinese medicine. The names of herbal medicines reflect humanity's perception of the world and hold significant social and cultural meanings. Naming is a fundamental component of the linguistic process, significantly influencing how we perceive other species and entities. People use the names of herbs to identify and infer the varieties of plants in the organic world, revealing the characteristics of their worldview in social and cultural contexts.

There has been considerable interest in the motivation behind plant naming. Xu Yanqin and others (2014) have explored the methods of plant naming and the origins of plant names. Ding Yan (2020) analyzed the role of metaphors in the evolution of the meanings of plant terms from a cognitive perspective, investigating the intrinsic relationship between the evolution of meanings, cognitive mechanisms of metaphors, and social culture. Tan Hongjiao (2020) and Lei Hui conducted analyses on the categorization, metaphor, and metonymy of plant names, aiming to reveal the word formation characteristics, naming reasons, meaning extension mechanisms, and cognitive patterns of the Han nationality regarding plants. Zeng Ya and Wan Guangrong (2023) examined the metaphorical characteristics and reasons for Chinese plant names through quantitative analysis. Jiang Xiangyong and Lu Xiaoling (2024) systematically explored the cognitive mechanisms behind the naming of medicinal substances in *Oversea Materia Medica*. It is evident that previous research has primarily focused on the exploration of plant names, while studies on the naming of traditional Chinese herbal medicine have been relatively scattered and mostly descriptive. Previous scholars have concentrated on the grass section of *Compendium of Materia Medica*, with limited involvement in the naming of vegetables and fruits.

Therefore, this article aims to reveal the cognitive mechanisms behind the naming of vegetable and fruit herbal medicines in *Compendium of Materia Medica*.

2. Methodology

2.1 Data Source

This paper focuses on 55 types of herbal medicines from the Vegetable and Fruit Sections of the *Compendium of Materia Medica*, systematically analyzing the rationale behind their naming and the cognitive mechanisms involved in the naming process. The Compendium of Materia Medica, compiled by Li Shizhen during the Ming Dynasty, is a monumental work in pharmacology that includes approximately 1,892 medicinal substances. Li Shizhen conducted extensive field research based on previous works, providing detailed descriptions of the sources, properties, effects, and usage of the recorded medicines, ensuring the accuracy and authority of its content. The vegetable and fruit sections represent important resources of herbal and fruit materials in Chinese herbal medicine. The vegetable section encompasses many common herbal plants, such as Gan Jiang (干姜) and Bai He (百合), which hold significant importance for traditional Chinese medicine and daily life. The fruit section involves numerous fruit-based medicinal materials, such as Yin Xing (银杏) and Shan Zha (山楂), which can be used medicinally and are often processed into food or health products.

2.2 Data Collection and Analysis

This paper primarily analyzes the explanation of the names of 55 medicinal materials from the Vegetable and Fruit Sections of *the Compendium of Materia Medica*, cross-referencing them with relevant traditional Chinese medical references such as *Er Ya* (尔雅) and *Tujie Ben Cao Gang Mu* (图解本草纲目). Following this, a classification and statistical analysis of the naming motivation is conducted, summarizing and organizing the naming patterns of the medicinal materials in the Vegetable and Fruit Sections of *the Compendium of Materia Medica* based on their frequency.

3. Results and Discussion

Through statistical analysis of the naming motivations of 55 kinds of herbs in the *Compendium of Materia Medica*, it is found that 42 kinds of herbs are named based on a single motivation such as shape, place of origin, color, etc., and 13 kinds of herbs are named by integrating the two motivations. The specific naming patterns are shown as follows.

3.1 Naming by Single Feature

In the Vegetable and Fruit Sections of *the Compendium of Materia Medica*, there are 42 kinds of herbs named by a single feature, including shape, efficacy, color, morphology, flavor, homophony, growing characteristics, medicinal part and so on. Among them, the shape accounted for the highest proportion (33.33%), followed by the place of origin (11.91%). The detailed quantity and proportion of herbs named based on a single feature in the Vegetable and Fruit Sections of *the Compendium of Materia Medica* are shown in Table 1 below.

Table 1. The Distribution of One-feature Naming Types of Drugs

Naming Types	Number	Proportion
Naming by Shape	14	33.33%
Naming by Place of Origin	5	11.91%
Naming by Morphology	4	9.52%
Naming by Homophony	3	7.15%
Naming by Color	3	7.15%
Naming by Efficacy	2	4.76%
Naming by Growing	2	4.76%
Naming by Flavor	2	4.76%
Naming by Transliteration	2	4.76%
Naming by Picking Time	1	2.38%
Naming by Folklores	1	2.38%
Naming by Making	1	2.38%
Naming by Odor	1	2.38%
Naming by Growing	1	2.38%
Total	42	100.00%

3.1.1 Naming by Shape

Shape refers to the characteristics of the plant body and a certain part of the plant body in size, length, height, thickness, thickness and geometric figures such as circle, curve, square, flat, vertebra, rhombus, straight and so on (Tan, 2004:76). In the *Compendium of Materia Medica*, 14 kinds of herbs are named after their shapes. According to the book: "蒜，又象蒜根之形". The growth form of Suan (蒜) resembles its shape, which is why it is named Suan (蒜). Jiu (韭) grows together in the shape of the word "韭", so it is name Jiu (韭). Hieroglyphics highlight the external characteristics of medicinal materials through their shapes. For example, Zhi (芝) describes the zigzag characteristics of the herb stem, so that the characteristics of this part are directly highlighted, so that people can see at a glance, forming intuitive images. The name Long Yan (龙眼) is a description of the dragon-like eyes on the outside of the herb.

The shape naming of herb is based on the external shape characteristics of traditional Chinese medicine, which is the result of visual priority.

3.1.2 Naming by Place of Origin

The functions and curative effects of Chinese herbs are often affected by the soil and local climate conditions in which they are grown. The ancients attached great importance to authentic medicinal materials and often added place names to the names of high-quality medicinal materials in order to distinguish them from those from other places. For example, Wu Zhu YU (吴茱萸), this kind of herb is named after the varieties planted in Wu, so it is named after Wu (吴). Some herbs are named according to the region or country of origin, often with the words Fan (番), Hu (胡), Xi (西), etc. For example, the source of An Shi Liu (安石榴) is the state of 安石国, and the source of 葫 is 胡地.

3.1.3 Naming by Morphology

Morphology refers to the state and morphology of the plant body and a certain part of the plant body, such as drooping, coalescence, four-cloth, dense, lush, extended and so on (Tan, 2004:78). Morphology is perceived by human vision and finally formed into a concept. According to different personal concerns, the description of object form will be different. Some justifications derive from the overall form of the drug, while others describe the form of a part of the drug, forming the justifications. Others derive their names from the characteristics of the relative relationships between the parts or whole of the drug. For plants, the objects described mainly cover roots, lotus, leaves, fruits, flowers and other parts. For example, the root of a Bai He (百合) is composed of petals. The root and stem of onion are straight and hollow, like a chimney, so it is called onion (葱).

3.1.4 Naming by Color

Color helps distinguish similar herbs. Color motivation refers to the name of medicine after color. Color elements include not only the colors represented by color words, such as red, yellow, blue, etc., but also the colors of familiar objects. This form of reasoning is often used in the naming of traditional Chinese medicine. Such as Ju (橘), the so-called Ju (矞), refers to the outside red, the inside yellow, like a dense cloud. The orange fruit is red on the outside and yellow on the inside. When it is cut open, its fragrance fills the air, just like orange clouds, hence its name Ju (矞). Another example is Qin Guo (青果), which shows it's color when ripe, hence the name.

3.1.5 Naming by Homophony

Exegetical studies have shown that shape (form), sound and meaning are important clues to explore the naming of plants, in which the word sound (sound training) is an important aspect to explain the meaning (Wang, 2011). When the wood is strong and the branches are weak and firm, Li Zhi (荔枝) can not be picked but use a knife and axe to cut its branches. Li Zhi (荔枝) is originally from the branches, after leaving the branches it soon will be bad, which named for the characteristics of litchi fruit. Li Shizhen in Ming Dynasty in the *Compendium of Materia Medica* ·Fruit three ·Litchi also mentioned: "According to Bai Juyi: 若离本枝，

一日色变，三日味变。则离支之名，又或取此义也." Mei (梅) sounds like mei, which is a homophone.

3.1.6 Naming by Efficacy

Efficacy refers to the healing effect of herbs, and many Chinese herbs are named after their efficacy. The herb Qian Shi（芡实）can be used as food to supplement the lack of nutrition, so it is called Qian Shi. According to the *Compendium of Materia Medica*: "薑能御百邪，故之谓薑" (Ginger can ward off a hundred evils, hence it is called Jiang (姜). Naming directly by efficacy can significantly reduce people's cognitive load, making the effects more apparent.

3.1.7 Naming by Transliteration

Some of the medicinal materials in Vegetable and Fruit Sections of *the Compendium of Materia Medica* were from foreign countries or were imported from foreign areas, in the naming directly borrowed the pronunciation of the original language, that is, named by transliteration. For example, the word Bin Lang（槟榔）is derived from the Malay word pinang. In ancient Chinese, grapes were called "蒲陶", "蒲萄", "蒲桃" or "葡桃" (Pu Tao), which are derived from the transliteration of the Persian word budawa.

3.1.8 Others

In addition, in the Vegetable and Fruit Sections of *the Compendium of Materia,* there are some herbs named after the growing characteristics, flavor, picking time, folklores, processing method, odor and growing environment. Processing method refers to the special processing and treatment process of medicinal materials, and some medicinal materials are named from their processing method. For example, Gan Jiang (干姜), according to the *Compendium of Materia Medica*: "凡作干姜法：水淹三日，去皮置流水中六日，更刮去皮，然后晒干" (Where to make dried ginger method: water for three days, peel and put in running water for six days, shave the skin, and then dry). Among them, dry means that this kind of medicine is obtained by drying. Some Chinese medicines are named after the time they were picked. Such as Dong Gua (冬瓜) is mature in winter, planted in February and March every year. In addition, odor is also an important feature of traditional Chinese medicine. Such as Hui Xiang (茴香), according to the *Compendium of Materia Medica*: "下少许，即无臭气，臭酱入末亦香，故曰回香" (With a slight decrease, there is no odor; the stinky sauce becomes fragrant when ground into powder, hence it is called Hui Xiang.). It can be seen that the name comes from the unique aroma characteristics. Naming after folklores refers to the name of a medicine derived from folklore. Lai Bei (莱菔), phonetically associated with Lai Fu (which means coming fortune) in folk culture, symbolizes good luck and happiness.

It can be seen that the shape accounted for the highest proportion (33.33%), followed by the place of origin, accounting for 11.91%. From a cognitive point of view, shape is the first and most prominent feature that people perceive when viewing herbs, which can help people identify and find herbs. The place of origin is the key to determining the quality of the medicine, so it will be highlighted in the naming. The efficacy, growing environment, growing characteristics, color, odor, shape, processing methods, etc. of medicinal materials

are closely related to the identification and use of medicinal materials, so this important information will also be prioritized into the drug name.

3.2 Naming by Integrating Features

With the continuous development of people's cognitive level, people have a more comprehensive understanding of medicinal materials, a more detailed classification, and a more detailed description of medicinal materials, which can play a role in distinguishing and referring. Reflected in the naming, it is necessary to integrate a variety of motivations to increase the information in the names of medicinal materials. In the *Compendium of Materia Medica*, there are 13 kinds of herbs named on the basis of integral features, among which the place of origin and flavor type accounts for the highest proportion, followed by the integration of growing environment and shape. The detailed quantity and proportion are shown in Table 2 below.

Table 2. The Distribution of Integrating-features Naming Types of Drugs

Naming Types	Number	Proportion
Naming by Place of Origin & Flavor	3	23.10%
Naming by Growing Environment & Shape	2	15.38%
Naming by Shape & Flavor	2	15.38%
Naming by Shape & Color	2	15.38%
Naming by Place of Origin & Shape	1	7.69%
Naming by Growing Environment &	1	7.69%
Naming by Place of Shape & Medicinal	1	7.69%
Naming by Shape & Property	1	7.69%
Total	13	100.00%

3.2.1 Naming by Place of Origin & Flavor

Place of origin refers to the original or main origin of herbs, while flavor refers to the nature and smell of drugs, that is, four properties and five tastes. The four properties and five taste are one of the basic contents of the theory of TCM properties. Among them, the four properties include the rise, fall, sink and float of medicinal properties, and the five tastes include sweet, acid, pungent, salty and bitter (Yang, 2005:13-17). Such as pepper, the *Compendium of Materia Medica* recorded that "今南番诸国及交趾、滇南、海南诸地皆有之。因其辛辣似椒，故得椒名" (The southern regions, including the countries of Jiaozhi, Dianan, and Hainan, all have this. Because it is spicy like pepper, it is thus named pepper).

The word Hu (胡) in Hu Jiao (胡椒) refers to its production from the southern Pan countries and Cochin, southern Yunnan, Hainan, where the word Jiao (椒) refers to the herb spicy like pepper. The same is true of Shu Jiao (蜀椒), Shu refers to the ancient Chinese Shu area, and Jiao refers to its spicy like pepper, so the word Shu Jiao refers to the name that integrates the place of origin and flavor. Carrot, which first came from the Hu region during the Yuan Dynasty, has a taste similar to that of radish. The combination of place of origin and flavor is named from the perspective of the origin of Chinese herbs and people's taste, to reflect its characteristics and efficacy.

3.2.2 Naming by Growing Environment & Shape

Chinese herbs are often named for their growing environment and shape. Hai Song Zi (海松子) is actually a kind of pine nut, growing in the ocean, and its shape and appearance are similar to the plant fruit of pine nut, so it is named Hai Song Zi. Similarly, Mu Er (木耳) refers to a fungus that grows on decaying wood. The Mu part indicates its growth on trees, while Er/ear describes its shape, which resembles an ear. Through this naming method, people can quickly identify and describe Chinese herbs, understand their growth and morphological characteristics, and facilitate collection and use.

3.2.3 Naming by Shape & Flavor

Shape and flavor can perceive the characteristics of medicinal materials from people's visual and taste angles respectively, and the integration of the two names can quickly anchor medicinal materials. Tian Gua (甜瓜) is derived from the integration of flavor and shape, of which Tian/sweet refers to the sweet flavor of this kind of medicine, while Gua/melon refers to the state of its tendril during the growth process. Another example is Ma Chi Xian (马齿苋), according to the *Compendium of Materia Medica*, "其叶并比如马齿，而性滑利似苋" (Its leaves are like horse teeth, and the nature is smooth like amaranth). The name derives from the integration of its shape and flavor.

3.2.4 Naming by Shape & Color

"In the combination of shape and color, 'ginkgo' and 'black yam' use 'silver' and 'black' to represent the colors of the plants, while 'gingko' refers to its resemblance to small apricots, and 'yam' indicates that its root resembles taro."

The naming method integrating shape and color visually describes the appearance characteristics of Chinese herbal medicine, which is easy for people to understand and recognize. In the combination of shape and color, the Yin/silver and Wu/black in Yin Xing and Wu Yu respectively represent the colors of the two plants, while Xing means that its shape is similar to a small apricot, and Yu/taro means that its roots are shaped like taro. Shape motivation makes it easy to associate with familiar things, which increases the convenience of identification, while color motivation constitutes an important identification feature, which helps to distinguish it from similar medicinal materials. This naming method based on shape and color not only reflects the observation of the appearance characteristics of plants, but also reflects people's in-depth understanding and application of medicinal materials.

3.2.5 Others

In addition, there are some medicinal materials in the *Compendium of Materia Medica* named by integrating place of origin & shape, growing environment & flavor, shape & medicinal part, shape & property, and so on. According to the *Compendium of Materia Medica*, "胡桃，本出羌胡，汉时张骞使西域始得种还；此果外有青皮肉包之，其形如桃" (Hu Tao originated from Qianghu, and was first planted in the Western regions by Zhang Qian in the Han Dynasty. The herb is covered with green skin and flesh, and is shaped like a peach). Hu Tao produced in the field, shaped like a peach, so it was named for the integration of place of origin and shape. The name Fei Shi/cypress seed comes from the shape of the leaves of the cypress tree, which resembles the character Fei (非), and its fruit, combined with seed. Hence, it is called Fei Shi/cypress seed. Its name is the integration of the shape and the medicinal part. Mu Gua（Mu Gua）is named for its appearance like a small melon, acid and edible, and has woody properties, which is the integration of the shape and property medicinal materials.

In the integrating naming pattern, the highest proportion is place of origin & flavor, accounting for 23.10%, followed by growing environment & shape, shape & odor, shape & color, accounting for 15.38%. The combination of shape, flavor and color, which frequently appear in naming, helps to identify medicinal materials. Place of origin, efficacy and odor are directly related to the use of medicinal materials, so they are often integrated with other characteristics to name medicinal materials.

4. Cognitive Mechanisms Underlying the Naming of Chinese Herbal Medicines

Jiang and Bai (2013:30-34) pointed out that language is the result of people's conceptualization of the external world based on their own experience, and it is not only a linguistic phenomenon, but also a cognitive phenomenon. Any language coding is not done randomly, and there are human cognitive mechanisms behind language generation. Cognition is the basis of language, and any new words are not created out of thin air, but have their own justifications（Jiang & Shao, 2013: 251-253）. The names of herbs in *Compendium of Materia Medica* can not be separated from linguistic motivation, and their names are the result of human cognition. Conceptual metonymy, conceptual metaphor and conceptual integration play an important role in the naming process of herbal medicine.

4.1 Conceptual Metonymy in Herbs Naming

Metonymy was originally also seen primarily as a figure of speech used for reference, and with the development of cognitive linguistics, metonymy has come to be regarded as a way of thinking that we rely on in our daily life. Lakoff and Johnson（1980）point out that conceptual metonymy is an intra-domain mapping based on proximity, which is a cognitive process in which the whole or other parts are replaced by prominent, easily perceived, easily remembered, and easily recognizable parts, or the whole with gesture-sensing is replaced by parts. Or the cognitive process of replacing parts with whole with gestalt perception. Kövecses and Radden（1998：33-77）believe that conceptual metonymy is a cognitive process in which one conceptual entity (source domain) provides a mental channel for another conceptual entity (target domain) within the same conceptual domain. Langacker（1993：1-38）

defined metonymy as a reference point phenomenon, a process in which an entity provides psychological channels for metonymic targets by means of reference points through metonymic expression. The entity designated by metonymic words acts as a cognitive reference point, providing psychological accessibility to the described goal and thereby directing the reader's attention to the goal to be reached.

The essence of metonymy is the cognitive process of referring one object to another object in a unified conceptual domain. Langacker (1999) believes that metonymy can skillfully coordinate the principle of information maximization and the principle of cognitive prominence. At the same time, realizing the principle of cognitive prominence also realizes the principle of economic maximization. Herbs in the *Compendium of Materia Medica* of the single naming pattern are based on the conceptual metonymy to select the most eye-catching and most prominent typical characteristics such as shape, place of origin, color, property, flavor, etc. The metonymy naming pattern behind it is shape for herbs, place of origin for herbs, morphology for herbs and growing characteristics for herbs. According to Li Shizhen's *Compendium of Materia Medica*, "琵琶，其叶形似琵琶，故名" (Pipa, whose leaves are shaped like pipa, hence gets its name). It can be seen that the name Pi Pa (琵琶) comes from the similarity between the shape of the plant and the musical instrument pipa. This prominent appearance has become an important reference point for the identification of the drug, which is easy to identify. The name onion directly describes its straight hollow outer morphological characteristics, long and thin petiole, hollow in the middle. This concise and clear naming method can accurately convey the morphological characteristics of onion, so that people can quickly identify and use this common medicine, reflecting the economy of language.

Shu (2024:18-28) pointed out that people's understanding of things is often not accurate or comprehensive, and the naming of things has to be so as to reach another, usually referring to the most significant features or the most important features for the namer. Jiang and Lu (2024:1-12) pointed out that whether Chinese herbal medicine is named based on a single feature or integrates multiple features, it replaces the whole with prominent, easily recognizable and easily perceived partial features, and its essence is the result of the conceptual metonymy mechanism in which part replaces the whole. The naming of herbs in the Vegetable and Fruit Sections of *the Compendium of Materia Medica* is also a reflection of the cognitive mechanism of conceptual metonymy, whether it is named by single motivation or by integrated motivations.

4.2 Conceptual Integration in Herbs Naming

When a single feature is insufficient to describe a medicinal material, the namer will integrate multiple features to assign a name, reflecting a cognitive mechanism that is universally present in human language, thought, and behavior: conceptual integration. Conceptual integration theory, developed by scholars such as Fauconnier (1997) and Turner (2002) on the basis of the theory of mental spaces, defines conceptual integration as the merging of mental spaces. Mental spaces are collections of small concepts that individuals construct in order to comprehend current discourse in thought and conversation. According to them, conceptual integration is a fundamental and universal cognitive process in humans.

Fauconnier and Turner (2002) argue that the integrative thinking acquired through biological and cultural evolution enables people to understand the physical, psychological, and social worlds in their lives.

Integration occurs in all aspects of human life, and the naming of Chinese herbal medicine is also inseparable from the function of conceptual integration. Such as the well-known Shan Zha (山楂) growing in the mountain thatched forest, this is the description of its growing environment. Shan Zha/Hawthorn has a similar sweet and sour taste to hawthorn. It can be seen that the name of Shan Zha is the clever integration of the growing environment and flavor. This integration process not only directly conveys the characteristics of hawthorn, but also provides useful guidance for people's cognition of this plant. The result of integration makes the naming of medicinal materials unique.

The naming of medicinal materials is not simply the addition of morphemes, but the integration of different concepts in mental space, so as to produce new concepts and meanings. The naming of Chinese herbs in *Compendium of Materia Medica* effectively embodies the economic principles of language through the integration of concepts and the synthesis of name forms.

4.3 Conceptual Metaphor in Herbs Naming

Traditional rhetoric considers metaphor as a means of modification, but cognitive linguistics considers metaphor as a cognitive phenomenon, which exists widely in all aspects of life. Metaphor not only appears in language, but also people's behavior and thinking are metaphorical. Lakoff & Johnson (1980:4-5) pointed out that metaphor is to use relatively familiar and concrete things to understand relatively unfamiliar and abstract things. Shu (2001) believes that metaphor is not only a cognitive phenomenon, but also an interaction between two different semantic domains. Liao (2016) believes that conceptual metaphor is a cognitive process, that is, using the source domain to conceptualize the target domain through a series of means such as association, comparison and evaluation. Metaphor, therefore, is based on similarity and is a tool for us to understand and conceptualize the external world.

Cognitive linguistics holds that the basis of experiential cognition determines the conceptualization of the objective world. When new things need to be named, people will involuntarily make reference and analogy to find the correlation between them and familiar things, and use familiar things to name them, so as to achieve cognitive economy and achieve the efficiency of communication with two birds with one stone (Zhao, 2001).

Metaphorical mapping in the naming of Chinese herbal medicine is a similarity-based cognitive approach. It requires that there exist some concepts similar to the characteristics of medicinal materials in the conceptual system of the cognitive subject. In this mapping, the properties and similarities of medicinal materials are closely related. For example, medicinal materials are static plants or objects, which makes it difficult to find target concepts with auditory features as similarities in people's cognition. However, medicinal materials have static characteristics such as shape, color, flavor, and odor, which are common to many things and can therefore be compared to produce similarities.

In the process of cognition and concept formation, people need to place objects in specific conceptual networks in order to mobilize existing knowledge and experience to recognize and process them. For the naming of Chinese herbal medicine, it must be placed in the knowledge network related to Chinese herbal medicine, so as to be recognized and named. This knowledge network provides a path for the metaphorical mapping of Chinese herbal medicine. In this process, similarity is the key element, and metaphorical mapping can connect Chinese herbs with other things and enrich the understanding of the meaning of medicinal materials. For example, "Purslane", whose leaves are arranged in the shape of horse teeth, hence the name. In addition, names like Hai Song Zi/sea pine nut and Pu Gong Ying/dandelion are derived from their similarity in appearance to other things.

The metaphorical cognition of medicinal herbs is based on similarity, which is premised on the property of Chinese herbal medicine itself. Using familiar concepts to recognize unfamiliar concepts is the cognitive psychological motivation of similarity mapping, which plays an important role in the naming of Chinese herbs.

5. Conclusion

Traditional Chinese medicine resources are strategic national resources. Analyzing the origins and naming motivations of medicinal plants provides important insights and guidance for the identification and cultivation of these plants, the authentication and application of herbal materials, and the development of TCM resources.

Through the investigation of the naming rationale for 55 herbs included in the sections on fruits and vegetables, it was found that 42 of these materials were named based on a single feature, while 13 were named by integrating two features. The motivation for single-feature naming pattern primarily includes characteristics such as morphology, medicinal parts, efficacy, color, place of origin, growing environment, property, odor, and folklores. In contrast, integrating naming patterns mainly integrate place of origin with flavor, growing environment with shape, and shape with flavor, among others. Single-feature naming emphasizes the singular characteristics of the herbs, while compound naming provides a more comprehensive description of their multiple features, aiming to accurately convey the source, morphology, and medicinal properties of the herbs.

From a cognitive perspective, metonymy and metaphor are primary cognitive means through which human conceptual systems are formed. Analyzing the naming of medicinal materials reveals that such naming uses the most prominent features to represent the herbs, focusing on visual characteristics like shape and color, which are essentially instances of conceptual metonymy. Although the naming of medicinal materials exhibits diverse cognitive mechanisms, the processes of conceptual metonymy, conceptual metaphor, and conceptual integration work together and are inseparable.

Acknowledgements

Note

Note 1. The *Compendium of Materia Medica* mentioned in this article is from the following edition: Written by Li Shizhen, annotated by Liu Hengru. *Compendium of Materia Medica* [M], Beijing: People's Medical Publishing House, 2004. (李时珍著，刘衡如校注.本草纲目 [M]，北京：人民卫生出版社，2004.)

References

Ding, Y. (2020). *A Study on the Plant Terms of the Chinese Language*. Inner Mongolia University.

Fauconnier, G. (1997). *Mappings in Thought and Language*. Cambridge: Cambridge University Press. https://doi.org/10.1017/CBO9781139174220

Fauconnier, G., & Turner, M. (2002). *The Way We Think*. New York: Basic Books.

Jiang, X.-Y., & Bai, X.-H. (2013). Cognitive Interpretation of Chinese ABB-type network overlapping words. *Foreign Languages Research,* (3), 30-34.

Jiang, X.-Y., & Lu, X.-L. (2024). Cognitive Terminology Perspective Exploration of Chinese Medicine Naming: A Case Study of Oversea Materia Medica. *China Terminology, 26*(3), 3-12.

Jiang, X.-Y., & Shao, J.-P. (2013). A View of Linguistic Motivation from English and Chinese New Words. *Hunan Social Sciences*, (5), 251-253.

Kövecses, R. (1998). Metonymy: developing a cognitive linguistic view. *Cognitive Linguistics, 9*, 37-77. https://doi.org/10.1515/cogl.1998.9.1.37

Lakoff, G., & Johnson, M. (1980). *Metaphors We Live by*. Chicago: The University of Chicago Press.

Langacke, R. W. (1993). Reference-point constructions. *Cognitive Linguistics*, (4), 1-38. https://doi.org/10.1515/cogl.1993.4.1.1

Langacke, R. W. (1999). *Grammar and Conceptualization.* Berlin&NewYork: Mouton de Gruyter. https://doi.org/10.1515/9783110800524

Liao, G.-R. (2016). *Cognitive Linguistics and Chinese Studies.* Changsha: Hunan Normal

University Press, pp. 133-135.

Shu, D.-F. (2001). *Studies in Metaphor*. Shanghai: Shanghai Foreign Language Education Press, pp. 28-50.

Shu, D.-F. (2024). On the Metonymic Nature of Language Production. *Foreign Languages Bimonthly, 47*(1), 18-28.

Tan, H.-J. (2004). Research on Plant-naming in Acient Chinese. *Zhejiang University*, 76-78.

Tan, H.-J., & Lei, H.-Y. (2020). Language Cognitive Analysis of Plant Names in Modern Chinese. *Journal of Changchun University (Social Science Edition), 30*(9), 41-46.

Wang, C.-F. (2011). Explanations of Plants' names in Compendium of Materia Medica and Their Influences. *China Terminology, 13*(2), 51-53, 56.

Xu, Y.-G., Xu, Y., Hu, S.-F., & Ge, F. (2014). Traceability and Characters Analysis on Names of Traditional Chinese Medicine Plant. *Research and Exploration in Laboratory, 33*(4), 210-214.

Yang, L. (2005). *Traditional Chinese Pharmacy*. Beijing: People's Medical Publishing House, pp. 13-17.

Zeng, Y., & Wan, G.-R. (2023). Metaphor in the Chinese Naming of Plants: A Quantitative Study of Its Features and Contributing Factors. *Foreign Languages Research, 40*(5), 34-42.

Zhao, Y.-F. (2001). *An Introduction to Cognitive Linguistics.* Shanghai: Shanghai Foreign Language Education Press, p. 196.