

Research Progress in the Application of Medicinal Plants in Landscape and Architecture

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Abstract: Based on the characteristics and theoretical knowledge of different medicinal plants, this paper discusses the research progress and resource status at home and abroad. Under the characteristics and theoretical knowledge of different medicinal plants, we selected the landscape medicinal plants with health care effect and ornamental value and analyzed their ornamental points and color orientation comprehensively to improve the visual ecological effect. According to the characteristics of landscape medicinal plants, we offer some reasonable landscape references, which are conducive to creating a sustainable human habitat environment. It also puts forward new ideas on the application of medicinal plants in the construction of urban healthy landscape.

1 INTRODUCTION

In ancient and modern times, Chinese and foreign countries, medicinal plants have become indispensable raw materials for medical care and provide ornamental value for landscape. For example, medicinal plants such as Chinese rose, *Paeonia lactiflora*, *Celebrities*, *Salvia miltiorrhiza* and Jasmine are all commonly used ornamental plants. Therefore, as an important part of plant landscaping, medicinal plants have always attracted much attention in resource research, plant configuration and pharmacological effects.

Because medicinal plants are more suitable for cultivation and reproduction after cultivation and domestication, after careful collocation by designers, on the one hand, they can make full use of their rich resource advantages, give full play to their variety diversity, unique practical functions and ornamental value, and make the facade and color of plant landscape richer; on the other hand, it has great application value in creating urban health-care landscape, improving urban climate, popularizing medicinal plants, protecting plant diversity and stability, saving urban greening cost and soon. Therefore, while analyzing the ornamental value of medicinal plants at home and abroad and drawing lessons from case experience, it is necessary to put forward reasonable suggestions and new ideas. It is conducive to the creation of healthy medicinal plant

landscape and its promotion in urban gardens.

2 THE IMPORTANCE OF MEDICINAL PLANTS IN THE LANDSCAPE

2.1 Landscape

The word "landscape" can be traced back to the Bible, which is used to describe the charming scenery of Solomon Temple, a famous building in Jerusalem. In China, the word "landscape" can be interpreted as "landscape", "scenery" or "scenery" (Si 2011). "Encyclopedia of China" explains that "landscape" is a professional term, and both landscapes and landscape paintings belong to "landscape". Besides natural landscapes, there are also cultural landscapes (Hu 1993).

2.2 The Importance of Medicinal Plants

Medicinal plants are the raw materials of traditional Chinese medicine products, and have irreplaceable medicinal value. For example, their roots, stems, flowers, leaves and fruits contain anti-inflammatory and disinfectant phenols, antioxidant flavonoids, anthraquinone for treating constipation, bitterness for

helping digestion, and volatile oils, tannins, coumarins and anthocyanins with different drug effects, which can play a role in preventing and treating diseases (Luo 2009). For example, tanshinone, a component of *Salvia miltiorrhiza*, can promote blood circulation, remove blood stasis and clear away heat and toxic materials; Quercetin in Chinese rose can inhibit influenza virus and anthocyanin can resist oxidation. Colchicine, a component of lily, can treat gout.

Wikipedia defines medicinal plants as "plants with medicinal value". From the disciplinary point of view of "Medicinal Botany", most plants in nature, if their whole plants or parts or their physiological and pathological products contain special substances for preventing and treating diseases, can be called medicinal plants (Fan et al. 2013)

2.3 Medicinal Plants and Landscape

There are many varieties of medicinal plants with visual aesthetic value, which are colorful or graceful, and their roots, stems, buds, leaves, flowers, fruits, branches and stems are ornamental, which can be used for people to enjoy, evaluate and convey the beauty of artistic conception and have landscape value. The landscape medicinal plants can include woody plants (coniferous trees and shrubs, broad-leaved trees and shrubs, and broad-leaved vines), lianas, herbaceous plants, turf plants, etc. (Kong 2013)

In the scenery of medicinal plants, the basic model structure of landscape ecology should also be used, and the "patches" planted in large areas (such as large green spaces and small street green spaces), the "corridors" planted in narrow areas (such as landscape promenade, highway green belts and bridges) and the "matrix" connected with the overall situation in relatively large areas should be considered, and the relationship and functions among them should be brought into full play. Enhance the visual effect (Elizabeth 1992, Naveh and Lieberman 1984)

In the design of urban healthy landscape plants, it is necessary to screen ornamental and non-toxic varieties according to their habits, characteristics and efficacy, configure them into ecological plant communities at different levels, select scattered trees, shrubs and ground cover plants, and rationally configure them according to their color shades and color combinations, so as to construct the prospect, medium scenery and background. Make the space have a sense of hierarchy, thickness and coordination. Combining science with artistry, let plants adorn the

environment, and the environment sets off plants, bringing out the best in each other. Combining artistic aesthetics with design aesthetics, the public can appreciate the "garden art beauty" of medicinal plants.

3 CURRENT SITUATION OF MEDICINAL PLANT RESOURCES IN CHINA

In 1992, China completed a national survey of Chinese medicine resources, with a total of 11,146 species, accounting for 87% of the total Chinese medicine resources, involving 383 families and 2,309 genera, including algae, fungi, lichens, mosses, sugarcane and seed plants, with 80% of wild varieties (Ding et al.). Some medicinal plants can adapt to different ecological environments, and have both medicinal value and high ornamental value (Luo 2009).

4 RESEARCH PROGRESS OF MEDICINAL PLANTS IN LANDSCAPE ARCHITECTURE AT HOME AND ABROAD

4.1 Domestic Research Progress

4.1.1 Application of Medicinal Plants in Ancient Gardens

China is rich in medicinal plant resources. Because of its practicality and ornamental value, medicinal plants have a long history in gardens (Guo 2008). In the Neolithic Age, people discovered edible or medicinal wild plants, and domesticated, cultivated and cultivated them gradually, which can be called "the earliest" garden plants. During the Yin and Shang Dynasties, Oracle Bone Inscriptions textual research "Liu, Sang, Bai, Xing" and other Oracle characters, at this time, Chinese medicinal garden plants have been recorded (Zhao 1988). During the Han Dynasty, there were more than 3,000 kinds of seed plants in Shanglin Yuan (Han Dynasty Royal Gardens), including a variety of medicinal plants and medicinal and edible plants, such as loquat, orange, plum, orange, grape and other fruits, as well as medicinal materials such as *Rhizoma belamcandae*, ginger, magnolia bark and cassia.

According to literature records, there are 178

plant names mentioned in the Book of Songs (Shang et al. 1989). In 2017, Liu Chang 'an counted more than 50 kinds of medicinal plants in the Book of Songs (Liu 2017). Zhen Zhiya listed the names of 51 plant medicines in the Book of Songs in the 2nd edition of History of Chinese Medicine. Including sweet potato (Chinese trumpet creeper), Artemisia (Green Artemisia), Paeonia lactiflora, Chinese Glossy Privet, Verbena, Pepper, Papaya, Licorice, Mulberry leaves, and Cedarwood. Bencaojing Jizhu edited by Tao Hongjing in the Later Liang Dynasty, aims to "All the fine and coarse are taken, and nothing is left behind". Realgar, flax, pomegranate and grapes produced in the Western Regions are used in gardens. These medicinal plants also mark the grand occasion of the exchange on the Silk Road (Tan 2016).

During the Ming Dynasty, Compendium of Materia Medica written by Li Shizhen showed the modern medicinal botany configuration, which involved a wide variety of medicinal garden plants. In Qing Dynasty, the Flower Mirror written by Chen Haozi described the characters of some representative horticultural plants and herbs, and detailed their cultivation methods and medicinal values.

4.1.2 Application of Medicinal Plants In Modern Gardens

In the modern garden period, combined with the concept of garden plants and the value of medicinal garden plants, medicinal plants are briefly summarized as: not only can they be used as protective plants and economic plants in the garden landscape, but also have the medicinal value of disease prevention and medical care, and their flowers, leaves and fruits are ornamental woody and herbaceous plants (Li and Kang 2015, Li 2007).

The earlier medicinal botanical gardens in China include Guangxi Medicinal Botanical Garden (opened in 1960s) and Kunming World Expo Garden (opened in 1990s), which are widely praised by the public because of their popular science and ornamental value.

In this paper, the relevant theoretical researches on the planning and design of medicinal botanical gardens in China are summarized: in 1995, Li Tong of the Chinese Academy of Medical Sciences and others elaborated on the functional zoning and ornamental value of the medicinal botanical garden in the Scenic Planning of the Medicinal Botanical Garden; In 1999, Zhao Ronghua, Yunnan College of Traditional Chinese Medicine, published "Construction Conception and Aesthetic Characteristics of Medicinal Botanical Garden" in

combination with Chinese classical gardening techniques, expounding the conception and aesthetic thoughts of medicinal botanical garden (Zhao and Luo 1999). In 2007, Meng Xinhui published Key Points of Planning and Design of Medicinal Botanical Garden, which expounded the layout, functional zoning and application techniques of medicinal botanical garden (Meng 2007). Thereafter, Articles combined with practical cases have been published one after another, including botanical gardens in Beijing, Shanghai, Xi 'an, Chongqing and Sichuan, which have carried out relevant research on specialized gardens of medicinal plants. However, most of these articles are practical projects, and the planning and design theory of medicinal plants is neglected. With the establishment of the concept of "sustainability science" (IUCN 1991), in recent years, the research on sustainable landscape has increased, and the medicinal plants in landscape have begun to be studied in more detail. Medical colleges and Chinese medicine pharmaceutical enterprises have opened up medicinal botanical gardens and specialized gardens one after another, so that the academic circles of landscape gardening and the application practice of medicinal plants can complement each other.

4.2 Research Progress Abroad

4.2.1 Germination Period-Roman Period

The medicinal botanical garden took shape in Roman period. People planted medicinal plants with practical value in the "family garden" in order to "use local materials", including edible plants or herbs with medicinal effects such as curing diseases and healing wounds. Over 700 BC, Pliny (a gardener), described that rosemary and violets exude charming fragrance in villa gardens (Sha 2013) At this time, the most common medicinal plants include rosemary, lily, violet, rose and mustard (Tribe et al. 2002).

4.2.2 Development Period-Middle Ages

During the Middle Ages, the gardening forms of monasteries were gradually diversified. The "medical garden" for healing and health care and the "kitchen garden" for food are the origins of western medicinal botanical gardens (Luo 2009). Building "Abbey Garden" is convenient for people to produce medicinal plants and spices, including vegetables, medicinal materials and herbs for daily use (James 1998).

4.2.3 Prosperity Period-renaissance Period

At the beginning of the 16th century, gardeners gradually increased the comprehensive functions of medicinal botanical gardens, and established Herb Garden, where medicinal plants with functions of spice, seasoning, dyeing and weaving were planted. With the opening of the world-famous Italian Botanical Garden of Pisa (Orto botanico di Pisa) and Botanical Garden of Padua (Orto Botanica) to the public, scientific research medicinal botanical gardens are popular in Europe. Replaced the former medicine garden and monastery garden (Jurke 2010). The development of medical treatment has also driven many universities to build medicinal botanical gardens, which has the function of teaching practice and laid a solid foundation for the development of modern large-scale comprehensive medicinal botanical gardens (Huang 2010).

4.2.4 Current Situation of Foreign Research

In recent years, countries have carried out research on medicinal landscape plants. In Portugal, according to the survey, there are 105 kinds of medicinal landscape plants commonly used in the community, and people widely use the pharmacology and efficacy of medicinal plants to treat diseases (Vinagre 2019). In the United States, in recent years, researchers have collected information on healthy landscape plants and discussed with clinicians about the use and culture of herbs. In India, the flora of medicinal plants is rich, the heterogeneity of medicinal species in the landscape is high, and the natural vegetation landscape is more diverse than the plantation landscape (K et al. 2019). Nowadays, the research and manufacturing department of herbal medicine in India is expanding, and medicinal plants and their derivatives are attracting much attention. Patent applications for cancer, diabetes and cardiovascular diseases are increasing (Chetan et al. 2017). In Brazil, Communities in Northeast studied the diversity of medicinal plants from the historical changes of Atlantic Forest landscape, and there were 66 species of such herbs and shrubs in the area (Taline et al. 2018).

4.3 Research Progress on Breeding of Medicinal Plants in Landscape Architecture

4.3.1 Technique of Tissue Culture

According to statistics, at present, more than 400

kinds of medicinal garden plants in the world have obtained asexual lines by tissue culture technology. Through artificial pollination and fertilization in vitro, medicinal plants, including Poppies, Lily, *Petunia hybrida* and onion orchid. In vitro fertilization can overcome mating incompatibility. The haploid medicinal plants cultivated by anther pollen include *Petunia hybrida*, *Begonia*, etc., which can shorten the breeding time. At the same time, it is beneficial to the protoplast fusion culture of plants. At present, ornamental medicinal flowers such as *chrysanthemum* and *Gerbera jamesonii* using this technology have been put into the market.

4.3.2 Gene Recombination Technology

Up to now, more than 1,000 transgenic plants have been approved for testing in the world, among which more than 80 kinds of transgenic plants have been obtained. In China, the commonly used medicinal ornamental flowers such as primrose, Dragon's month and violet have obtained the recombination of flower color genes, and the improvement of flower color has greatly improved the richness of landscape colors (Guo 2004).

5 APPLICATION OF MEDICINAL PLANTS IN URBAN HEALTHY LANDSCAPE

The medicinal plant varieties selected in landscape design should have different shapes, bright colors, ornamental or olfactory enjoyment. For example, in street greenbelts, small gardens and courtyards, the medicinal trees and shrubs such as osmanthus, clove, wintersweet and dragon boat flower with health care functions can optimize the experience of public gardens (Song 2011).

Landscape planting should pursue a sense of hierarchy, and the planting of groundcovers is also essential. Medicinal ornamental flowers (including *eustoma*, pansy and cockscomb) are widely used in urban green space. Their beautiful flowers and leaves can grow in both the north and the south, and they are favored in the landscape. In addition, medicinal ground cover plants with strong stress resistance are often selected for landscapes. They can reduce the management cost because of their strong adaptability and vigorous vitality (Wang 2010). In this paper, the commonly used medicinal plants in the landscape of gardens and cities are classified as follows (among

them, the concept of subshrubs and ground cover is cross, and some woody plants and lianas are also classified as shrubs).

5.1 Arbor Layer

5.1.1 Evergreen Medicinal Trees

Evergreen medicinal trees can keep their leaves all year round. Because of their wide variety and long ornamental period, they are beneficial to improve the ecological environment and enhance the ecological benefits. It includes balsam fir for dispelling wind and pain, magnolia for strengthening the spleen and relieving pain, magnolia for dispersing wind and dispersing cold, cedar for invigorating and reducing swelling, cough for clearing heat, oil pine for eczema and cough, maidenhair for liver and kidney yin deficiency, geranium for dispelling cold and relieving

pain, osmanthus for rheumatism and paralysis, and pincushion for detoxifying and reducing swelling.

Evergreen medicinal trees are an excellent choice as landscape street trees, which can improve the environment, increase the green coverage and shade, and have the functions of enjoying the shade, reducing diffuse reflection of road surface, preventing wind and isolating road pollution.

5.1.2 Deciduous Medicinal Trees

Deciduous medicinal trees refer to medicinal trees whose leaves fall off and enter dormant period in autumn and winter or dry season every year. Most of them are shaded in summer and deciduous in autumn and winter. Their leaves are of various shapes and colorful, and they have great ornamental value in autumn and October. The deciduous trees commonly used in landscape are shown in the following table.

Table 1: Commonly used medicinal deciduous trees.

Deciduous medicinal trees commonly used in landscape.	Ornamental point	Plant name	Medicinal value	Scientific name
Autumn leaves	Red fallen leaves	Chinese tallow tree	Treat stomach diseases and diarrhea	<i>Sapium sebiferum</i>
		Lan fruit tree	Root anticancer	<i>Nyssa sinensis</i>
		Sweetgum	Cure wedge (bad feet)	<i>Liquidambar formosana</i>
	Yellow fallen leaves	Ginkgo	Treat chronic tracheitis	<i>Ginkgo biloba</i>
		Huanggeshu	Expel intestinal parasites	<i>Ficus virens var. suDlanceolata</i>
Winter defoliation	Backbone and branches	Beech	Jianwei Xiaoshi	<i>Fagus longipetiolata</i>
		Goldenrain tree	Clearing liver and improving vision	<i>Koelreuterja paniculata</i>
		Locust	Eliminating phlegm and relieving cough, cooling blood and stopping bleeding	<i>Robinia pseudoacacia</i>
		Chinese pagoda tree	Clear heat and detoxicate	<i>Sophora japonica</i>

5.1.3 Medicinal Trees Fof Flower Viewing

Flowering medicinal trees with exotic, colourful or fragrant flowers, such as peach and magnolia in spring; hawthorn, magnolia, geranium, acacia and luan in summer; and mullein and laurel in autumn.

5.2 Shrub Layer

Shrubs include small trees and shrubs, and medicinal shrubs commonly used in landscape are shown in the following table.

Table 2: Commonly used medicinal shrubs.

Medicinal shrubs commonly used in landscape.	Ornamental point	Plant name	Medicinal value	Scientific name
Evergreen shrubs	Spring white flowers	Wear a smile	Huoxue yangyan	<i>Michelia figo</i>
	Summer purple flower	Wild jujube	Nourishing liver and calming heart	<i>Ziziphus jujuba var. spinosa</i>
	Summer purple flower	Hibiscus	Prevention and cure virus	<i>Hibiscus syriacus</i>
	Wicker	Salix microphylla	Eliminating dampness, promoting blood circulation and removing blood stasis.	<i>Salix hypoleuca</i>
Sheepberry	Atropurpureusfruit	Mulberry	Exhausting lung, relieving asthma, and promoting water circulation to reduce swelling	<i>Loranthus delavayi</i>
	Spadix	Tuber of pinellia	Eliminate pi and dissipate stagnation	<i>Arisaema franchetianum</i>
	Purple flowers and white flowers in spring and summer.	(Unpeeled) Root of herbaceous peony	Removing blood stasis and relieving pain	<i>Paeonia veitchii</i>
	Blue-purple flowers in summer	High/Noble aspiration	Tranquilize and relieve depression	<i>Corydalis polygalina</i>
Sheepberry	Summer crescent safflower.	Dragon tooth flower	Sedation	<i>Erythrina corallodendron</i>
	Globular safflower in summer	Chinese ephedra	Xuanfei antiasthmatic	<i>Ephedra sinica Stapf</i>
	Thin cylindrical stem	Rush	Clearing heart fire, promoting diuresis and eliminating dampness	<i>Ephedra sinica Stapf</i>
	Summer lilac flowers	Valerian	Expelling wind and relieving spasm	<i>Juncus effusus</i>
Sheepberry	Summer lilac flowers	Root of membranous milk vetch	Invigorate swelling and qi, Protect liverbe diuretic	<i>Valeriana officinalis</i>
	Twisted branches	Vine of multiflower knotweed	Nourishing the blood and tranquilization	<i>Astragalus chinensis</i>
				<i>Fallopia multiflora (Thunb.) Harald</i>

5.3 Ground Cover Layer

5.3.1 Herbaceous Ground Cover Medicinal Plants

Herbaceous medicinal plants are essential elements in landscape architecture, which can be summarized as annual, biennial and perennial, and the ornamental parts are mostly flowers or leaves. Considering the planting cost and efficiency in gardening, perennial flowers with perennial roots or bulbs are generally selected.

1–2-year-old herbaceous ground covers such as cosmos, pansy, malachite, perilla. Perennial herbs, such as Daylily, Evergreen, Acorus calamus, have strong vitality and high compatibility, and are widely used in street green spaces and wild country parks. Its medicinal plants should not be underestimated, for example, Daylily can benefit water and cool blood; Evergreen can detoxify and relieve pain; Acorus calamus can eliminate dampness and promote blood circulation.

Because the bulbous and perennial herbaceous ground cover plants are easy to cultivate and various

in variety, their underground parts are spherical or blocky, which can be propagated by dividing bulbous roots and are easy to store and transport. Commonly used in flowering mirrors and courtyard landscaping are iris, jade pin, maidenhair and wire fern.

5.3.2 Wood Native Medicinal Plants

Compared with herbaceous plants, woody ground

cover medicinal plants live longer. Designers choose plants with ornamental features such as flowers, leaves and fruits, or aromatic plants to enhance the richness of the landscape (Liu 2009). In this paper, the woody ground cover medicinal plants commonly used in landscape are classified, as shown in the following table.

Table 3: Commonly used woody ground cover medicinal plants.

Wood native medicinal commonly used in landscape.	Ornamental type	Plant name	Medicinal value	Scientific name
Deciduous type	Flower-watching type	Chinese rose	Huoxue antiphlogistic	<i>Rosa chinensis</i> Jacq
		cuckoo	Analgesia and bacteriostasis	<i>Rhododendron simsii</i> Planch
	Leaf-viewing type	Variegated wood	Activate EB virus.	<i>Codiaeum variegatum</i> (L.) A. Juss
		Hongbeigui	Secrete cancer-promoting substances	<i>Excoecaria cochinchinensis</i> Lour
	Fruit-viewing type	Chinese holly	Reduce blood lipid and inhibit bacteria	<i>Ilex cornuta</i>
		Firethorn	Eliminate stagnation and stop bleeding	<i>Pyracantha fortuneana</i> (Maxim.) Li
Evergreen type	Aromatic type	Jasmine	Clearing away heat and eliminating dampness	<i>Jasminum sambac</i> (Linn.) Aiton
	Observation of plant type	Photinia	Eliminating dampness, promoting blood circulation and detoxicating	<i>Photinia serrulata</i> Lindl.
		Pittosporum tobira	Treat waist and knee pain and toothache	<i>Pittosporum tobira</i>
	Aromatic type	Milan	Clear the lung and stop polydipsia.	<i>Aglaia odorata</i> Lour
	Fruit-viewing type	Nandina	Treat damp-heat and jaundice	<i>Nandina domestica</i>

5.3.3 Medicinal Vine Ground Cover Plants

Lianas are an excellent choice for three-dimensional greening, such as the combination of hedgerows with veranda and walls. Some medicinal rattan ground cover plants have extensive growth, high ornamental value and strong grip on the ground, which makes the facade landscape optimized (Zhang 2000).

Lianas which are prone to adventitious roots can attach and grow, and have strong vitality and rapid reproduction, and can cover the bare ground or indecent walls. They are suitable for vertical greening

without corridors. They are used to remove blood stasis, *Ficus sicaria* to dispel wind and blood stasis, creepers to activate the tendons and reduce swelling, and ivy to cure boredom and plague. This article collates medicinal vine groundcovers commonly used in the landscape. In this paper, the medicinal rattan groundcover plants commonly used in landscape were sorted out, as shown in the following table.

Table 4: Commonly used vine ground cover medicinal plants.

Medicinal vine ground cover plants commonly used in landscape.	Ornamental point	Plant name	Medicinal value	Scientific name
Evergreen vine	Viewing plants.	Ivy	Eliminating wind and dampness, promoting blood circulation and detumescence	<i>Hedera nepalensis</i> <i>var. sinensis</i> (Tobl.) Rehd
	Chrysanthemum	Honeysuckle/honeysuckle	Clearing away heat and toxic materials and resisting inflammation	<i>Lonicera japonica</i>
	White flower	Caulis trachelospermi	Treat rheumatism	<i>Trachelospermum</i> <i>jasnnoides</i>
	Viewing plants	Fufangteng	Shujin Huoluo, stop bleeding and eliminate blood stasis	<i>Euonymus fortunei</i> (Turcz.) Hand.-Mazz
Deciduous vine	Lvguo	Akebia	Clearing heat and diuresis, promoting blood circulation and dredging meridians	<i>Akebia quinata</i>
	Viewing plants	Ivy	Activate tendons and reduce swelling	<i>Parthenocissus</i> <i>tricuspidata</i>
	Purple flower	Chinese wistaria	Analgesic and insecticidal	<i>Wisteria sinensis</i>
	Orange red flower	Reach the sky	Activating blood circulation and dispersing blood stasis	<i>Campsis grandiflora</i> (Thunb.) Schum.
	Viewing plants	Polygonum multiflorum	Calm the nerves Nourishing blood	<i>Fallopia multiflora</i> (Thunb.) Harald
	Haw	Celastrus orbiculatus	Treat rheumatic edema	<i>Celastrus orbiculatus</i>
	Haw	Fruit of Chinese magnolia vine	Treat traumatic injury	<i>Kadsura heteroclita</i>
	Gourd fruit	Small gourd	Diuretic detumescence	<i>Lagenaria siceraria</i> <i>var. microcarpa</i> Hara
	White flower	Climbing fig	Treat puerpera's milk obstruction	<i>Ficus pumila</i>
	Viewing plants	Bitter gourd	Cure polydipsia and detoxify	<i>Momordica</i> <i>charantia</i>
Viewing plants	Loofah	Channeling meridians, relieving cough and resolving phlegm	<i>Luffa cylindrica</i>	
Pink purple floret	Polygonum axillaris	Lishui Tonglin, turbidity removal and disinfestation	<i>Polygonum plebeium</i>	
Lvguo	Actinidia arguta.	Treat heat and cold nausea	<i>Actinidia arguta</i>	
Purple flower (wintering at flowering stage)	Bougainvillea	Clearing away heat and harmonizing qi and blood	<i>Bougainvillea</i> <i>spectabilis</i> Willd	

6 THE ROLE OF MEDICINAL PLANTS IN LANDSCAPE

6.1 Ornamental Function

Medicinal plants with ornamental fruits, leaves, buds and flowers are generally selected in gardens, such as fruits with special shapes, such as gourds; Unique flowers such as *Datura stramonium*, *Paeonia lactiflora* and *Platy codon grandiflorum* can create a popular and attractive landscape.

6.2 Health Care Function

Most medicinal plants will release chemical substances with sterilization, disease prevention and treatment effects in their growth stage, which has healing function and is a kind of "natural therapy" with health care effect. People can improve their immunity through olfaction, external therapy or internal therapy, which is beneficial to their physical and mental health. Such as edible and drinkable *Osmanthus*, fig and hawthorn, it is fragrant and pleasant, also can sterilize and cure diseases.

6.3 Environmental Protection

6.3.1 Purify the Air

In recent years, the application of medicinal plants in landscape has become a new way to improve the quality of the environment. Medicinal plants can not only provide a large amount of oxygen through photosynthesis, but also absorb harmful gases such as HCl, SO₂. The representative plants are hawthorn and pomegranate which absorb SO₂. HCl absorbed cattail leaf, oleander and beauty Banana.

6.3.2 Sand Prevention and Noise Reduction

Planting medicinal trees and shrubs, such as *Cinnamomum camphora*, Cedar, *Osmanthus fragrans* and *Ligustrum lucidum*, which can be used as afforestation belts and isolation belts under expressways or viaducts can play a role in silencing and preventing sand.

6.3.3 Soil Consolidation and Slope Protection

Choose medicinal lianas with developed roots and plant them on river banks, ponds, expressways and under viaducts, so as to strengthen soil and protect slope.

6.4 Science Popularization

The popular science cards and plant identification two-dimensional codes of medicinal landscape plants are arranged in park green spaces and special gardens of medicinal plants, so as to popularize the names and drug effects of medicinal plants to the public and play a role in popular science education and promotion of Chinese medicine culture.

7 CONCLUSIONS

Fast-paced urban life leads to the generalization of human sub-health, the rejuvenation of patients with hypertension and the serious mental problems. People seek TCM health care to recuperate their bodies. Using medicinal plants to create a new urban health landscape, through the natural ecological environment, the public can experience the traditional Chinese medicine health culture (Zhao and Li 2019). So, it is extremely necessary to study the design of new urban healthy landscape, which can bring the ecological and health value of medicinal plants into full play and has broad application prospects.

7.1 According to Local Conditions, Create a Characteristic Landscape

There are many varieties of medicinal plants with different characteristics. Designers should create landscapes according to their characteristics and planting environment, and follow the principle of "adapting to local conditions". At the same time, considering its health, science, culture and artistry, the medicinal plants are applied to the urban healthy medicinal plant landscape.

7.2 Play the Role of Health Care and Create a Healthy Landscape

Landscape design should not only consider the ornamental value, but also benefit human health (Shen and Su 2001). It is necessary to carry out fine management on medicinal plants in the landscape, such as setting up warning signs and popular science propaganda signs (marking the therapeutic efficacy of Chinese herbal medicines) and warning poisonous plants (oleander and narcissus).

7.3 Use Economic Value to Create Sustainable Landscape

Exploring the comprehensive values of beautifying environment, tourism culture, health care and health care of medicinal plants is a new way to promote sustainable economic development (Cheng 2016). The economic benefits are enhanced through the development and promotion of its medicinal value, including processing herbs, extracting medicinal perfumes and harvesting the fruits of medicinal plants. Creating a picking medicinal garden, combining ornamental and productive, can drive local economic development. Therefore, the economic value of medicinal landscape plants is a blue ocean to be excavated.

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