Research on Regional Plant Landscape of Industrial Cities in Henan Province

Zhiyuan Xie1, Ying Huang1*, Xinghua Hu2

1School of Tourism and Landscape Architecture, Guilin University of Technology, 541006 Guilin, Guangxi, China
2Guangxi Institute of Botany, Chinese Academy of Sciences, 541006 Guilin, Guangxi, China

Abstract. Plant landscape is an indispensable part of the city. Regional plant landscape not only has excellent ecological benefits, but also can better show the regional characteristics and human culture of the city. Through the analysis of plant landscape in the industrial city, it is concluded that how to make better use of plants to create urban plant landscape with regional characteristics is the focus of regional plant landscape construction.

1 Introduction

With the rapid development of China's economy, the process of urbanization and industrialization has also been significantly accelerated. In the early stages of urban industrial development, the backwardness of industrial technology and the unreasonable development of resources caused serious environmental pollution. With the advancement of science and technology, the optimization and upgrading of the industrial structure, coupled with the increase of people's awareness of environmental protection, and increased efforts to control pollution, the air quality in industrial cities has gradually improved. This is the epitome of most industrial cities in China. The industrial cities in Henan Province mainly include Zhengzhou, Jiaozuo, and Pingdingshan etc. As an industrial city, economic development is closely related to environmental quality. Although mining mineral resources promotes economic development, it also brings many environmental pollution problems, such as air pollution and soil pollution. As we all know, plants have the function of purifying the air and protecting the environment. In the process of applying plants to create landscapes and improve the environment, industrial cities have also formed distinctive regional plant landscapes. Therefore, this research takes the industrial cities in Henan as the research object, and studies the regional plant landscapes of each city, in order to provide a reference for greening and beautifying the city.

2 The role of plant landscape in environmental protection

2.1 Purification and noise reduction effects of plants on the city

The impact of plants on the air is mainly reflected in the fact that plants can absorb harmful gases, purify the air, and can also reduce noise and adjust the climate. Some plants are highly resistant to air pollution, and can also absorb and accumulate pollutants [1], thereby purifying the air and protecting the environment. For example, Nerium oleander, Sophora japonica, Cinnamomum camphora, Privet, Koelreuteria paniculata, Ginkgo, Willow, Platanus, Crape myrtle, Ailanthus altissima, Paper mulberry, Chinese rose and other tree species have high resistance to SO₂. They can be produced by absorbing and using SO₂, and Sulfate becomes a substance beneficial to plant growth. These plants usually have dense leaves, leathery leaves or waxy layers and fluff, the harmful gas is difficult to pass through [2], which can be used as the basis to select suitable anti-pollution plants for industrial cities. The high and low scattered and rich plant landscape can not only beautify the environment, but also more effectively to purify the air and reduce the noise.

2.2 Purification effect of plants on soil pollution

Plants can absorb, utilize and enrich some heavy metal elements in the soil. For example, Holly, Poplar and other tree species have a high enrichment capacity for heavy metal elements such as Cr, Zn, Cu, Pb in the soil, which can transfer the heavy metals in the soil to the above-ground parts of plants [3]. Through the centralized treatment of plant above-ground parts, it can effectively reduce soil pollution and improve soil fertility [4].

3 General situations of plants in the industrial cities of Henan Province

Henan has a long history, which has witnessed the various stages of China's historical development. As the political
and Cultural Center for most of China's history, Henan developed many industries in ancient times and retained many ancient industrial heritages. In modern history, modern industrial cities were also born in Henan Province, such as Luoyang, Zhengzhou, and Jiaozuo [5]. Although the rise of industry has led to the rapid development of economy, but also caused urban environmental pollution, and the air pollution has become the main problem of the urban environment. In the past five to ten years, "smog" has appeared in many cities in Henan Province, and the air quality of each city in Henan Province is far behind that of other cities. In recent years, through the national policy guidance and significant efforts of governance, air quality has been significantly improved, but it has brought various aspects of impact, plant landscape is one of them. In order to create urban landscape and reduce air pollution, some anti-pollution tree species have been applied in some cities, forming a special regional plant landscape.

Henan Province is in the central plains, belonging to the transition from subtropical to warm temperate continental monsoon climate, have four distinct seasons, and enough rainfall. Henan Province is rich in plant resources, most of northern and southern plants are grow well here. The native plants in Henan mainly include Poplar, Ailanthus altissima, Sophora japonica, Willow, Paulownia, Melia azedarach, etc. [6]. The representative plants of main industrial cities in Henan Province are shown in Table 1.

Table 1. A survey of representative plants in major industrial cities of Henan Province

| Serial number | Major industrial cities | Main industry | Representative plant |
|---------------|-------------------------|---------------|----------------------|
| 1             | Zhengzhou               | Aluminum, steel, automobile manufacturing, cement, cigarettes, etc. | Platanus, Rosa chinensis, Chinese scholarartree, Paulownia purpurea, Populus tomentosa |
| 2             | Luoyang                 | Non-ferrous metal smelting, fuel processing industry, equipment manufacturing industry, etc. | Peony, Ginkgo biloba, Gleditsia sinensis, Honeysuckle, Elm |
| 3             | Jiaozuo                 | Chemical industry, equipment manufacturing, light textile industry, metallurgical building materials industry, etc. | Chinese scholarartree, Rosa chinensis, Taxus chinensis, Eucommia, Qing tan |
| 4             | Anyang                  | Metallurgical building materials industry, equipment manufacturing industry, coal chemical industry, food and medicine, etc. | Chinese scholarartree, Crape myrtle, beech, Qing tan, Chou tan, An gui |
| 5             | Pingdingshan            | Coal mining and washing industry, chemical industry, fuel processing industry, etc. | Camphor, Rosa chinensis, Paulownia, Cephalotaxus sinensis, Shan tong zi |
| 6             | Luohe                   | Food industry, chemical industry, equipment manufacturing industry, etc. | Paulownia, Rosa chinensis, Qi liu, False indigo, Ash trees |

4 Case study -- Analysis of regional plant landscape in Pingdingshan

4.1 Overview of Pingdingshan

4.1.1 Natural conditions in Pingdingshan

Pingdingshan is in the central-southern part of Henan Province, between 33°08'-34°20' north latitude and 112°14'-113°45' east longitude. It is in the transitional zone between mountains and plains, and has the characteristics of high west and low east. Pingdingshan has a continental monsoon climate, located on the edge of a warm temperate zone and a subtropical climate, with four distinct seasons and enough sunlight and rainfall. The city's annual average total sunshine hours are about 1868-2378h, and the annual average temperature is between 14.8～15.2℃; the extreme minimum temperature is -11.3℃, and the extreme maximum temperature is 38.1℃. The average annual precipitation in the city is about 1000mm, which is suitable for the growth of most woody plants.

4.1.2 Social factors in Pingdingshan

Pingdingshan's industries mainly include coal mining and washing industry, chemical industry, and fuel processing industry. Relying on abundant mineral resources and a solid industrial foundation, Pingdingshan’s economic development is very rapid. Although the energy model based on coal mining has driven rapid economic growth, it has also brought serious environmental pollution and climate change. The main pollution includes: when
mining coal mines, heavy metal elements in coal gangue such as Cr, Hg, Pb, Cu, Zn, etc. enter the soil and cause soil pollution [7], air pollution caused by coal fly ash, automobile exhaust, sulfur oxide and dust in the atmosphere [8]. Besides, with the growth of the population of Pingdingshan, the demand for resources is also increasing, which leads to the exploitation of more resources. Whether it is human life activities or mining activities, it will inevitably emit a large amount of Carbon causes the continuous increase of carbon emissions, which in turn affects the environment and climate [9]. In the past few years, residents lived in an environment with poor air quality most of the time. Because of this, Pingdingshan's plants are mostly anti-pollution tree species, such as Cinnamomum camphora, Sophora japonica, Koelreuteria paniculata, Privet, etc. The plant landscape is also mainly composed of anti-pollution plants.

4.2 Analysis of Regional Plant Landscape in Pingdingshan

4.2.1 Native plants in Pingdingshan

Cinnamomum camphora is the city tree in Pingdingshan. Cinnamomum camphora has been planted in Pingdingshan since the 1990s. It has a long history of cultivation and a large scale of planting area. Cinnamomum camphora is a large evergreen tree and a subtropical evergreen broad-leaved tree. It is evergreen all the year round with luxuriant branches and leaves, and it is an excellent tree species as a shade tree, street tree and sound insulation forest. At the same time, Cinnamomum camphora is an important environmental protection tree species because of its resistance to Cl₂ and other toxic gases.

The regionality of plant image creates regional plant landscape. Due to the different natural conditions, there are rich and diverse native plants in various places. Native tree species are incomparable in adaptability, stress resistance and cost. The native plants in Pingdingshan include Torreya grandis, Elm, Paulownia, Rhamnus, Sapindus, Shan tong zi, Lian xiang, etc. The common evergreen trees are Cinnamomum camphora, Magnolia grandiflora, Arborvita, Sabina chinensis, Cedar, Pinus tabulaeformis, Osmanthus, Privet etc.; And the common deciduous trees are Purple-leaf plum, Koelreuteria paniculata, Ginkgo, Ailanthus altissima, Chinese tallow, Melia azedarach, Sophora japonica, Albizia, Acer truncatum, Paper mulberry, Paulownia, Cotinus coggyria etc.

4.2.2 Regional plant landscape of Pingdingshan

Through the analysis of the common garden plants in Pingdingshan, the common garden plants in Pingdingshan are shown in Table 2. It can be concluded that in the industrial city, the plants with strong anti-pollution ability are mostly selected. For example, Cinnamomum camphora, Privet, Platanus, Koelreuteria paniculata, Magnolia grandiflora, and Zelkova schneideriana, etc., are mainly used as street trees; In the industrial zone, Sophora japonica, Melia azedarach, Ailanthus altissima, Ash tree, Paper mulberry. These plants either have strong noise reduction, smoke and dust resistance, or have a strong resistance to toxic gases. They have a strong adsorption and purification effect on industrial waste gas, and they can not only beautify the environment, but also purify the air and degrade the heavy metal pollution in the soil. In parks and residential areas, ornamental plants choose Ginkgo, Purple leaf plum, Albizia, Acer monoes, Acer palmatum, Chinese Tallow and Osmanthus, these plants not only have the characteristics of strong adaptability and strong resistance, but also have beautiful tree shape and hue changes; The plants in the waterfronts not only consider the landscape effect, but also consider the purification of water quality. For example, Reed can degrade the biological metabolism, Lotus can also reduce the content of phosphorus and nitrogen in the water, and increase the content of dissolved oxygen in the water.

5 Conclusion

The regional plant landscape not only has better ecological benefits, but also better demonstrates the city's regional characteristics and human culture. Through the analysis of the plant landscape in Pingdingshan, Henan Province, the plant landscape of industrial cities has more consideration of the ecological benefits of plants, such as the use of plants to purify air and soil to play an environmental role. At the same time, in the plant landscape construction of Pingdingshan, native plants have not been fully used. During the investigation process, the plant landscape with local characteristics is relatively lacking, with relatively few evergreen plants and colourful leaf plants, and the hue change of the plant landscape is slightly monotonous. There are few applications of plants to reflect urban characteristics. When creating a regional plant landscape, it is not only necessary to "fit the place with trees", but also to reflect the regional characteristics with the plant landscape. How to use plants to better show the urban style is a crucial aspect to be considered in the creation of plant landscapes.

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### Table 2. Common garden plants in Pingdingshan

| Serial number | Species name                  | Latin name                        | Tree species type       | Anti-pollution effect                        | Application                          |
|---------------|--------------------------------|-----------------------------------|-------------------------|---------------------------------------------|--------------------------------------|
| 1             | Cedar                          | Cedrus deodara                    | Evergreen tree          | Strong dust and noise reduction ability     | Parks, streets, residential areas    |
|               | Cinnamomum camphora            | Cinnamomum camphora               | Evergreen tree          | Strong resistance to harmful gases such as Cl₂ and HF | Parks, streets, industrial areas    |
| 2             | Arborvitae                     | Platycladus orientalis            | Evergreen tree          | Strong endurance to dirty air               | Parks, streets, residential areas    |
| 3             | Sabina chinensis               | Juniperus chinensis               | Evergreen tree          | Beautiful tree shape, pruning resistant     | Parks, streets, residential areas    |
| 4             | Black pine                     | Pinus thunbergii                  | Evergreen tree          | Strong ability to adapt to the environment and protective effect | Parks, streets, residential areas, industrial areas |
| 5             | Pinus tabulaeformis            | Pinus tabuliformis                | Evergreen tree          | Resistance to barrenness, strong vitality   | Parks, streets                      |
| 6             | Magnolia grandiflora           | Magnolia grandiflora              | Evergreen tree          | Anti-pollution, anti-wind                   | Parks, streets                      |
| 7             | Zelkova schneideriana          | Zelkova serrata                   | Evergreen tree          | Noise reduction and dust prevention         | Parks, streets                      |
| 8             | Cherry blossoms                | Cerasus × yedoensis               | Evergreen tree          | Flower tree species                         | Parks, residential areas            |
| 9             | Privet                          | Ligustrum lucidum                 | Evergreen tree or shrub | Strong adaptability and pruning resistance  | Parks, streets                      |
| 10            | Osmanthus                      | Osmanthus fragrans                | Evergreen tree or shrub | It has certain resistance to harmful gases such as Cl₂, SO₂, HF, etc. | Parks, residential areas, industrial areas |
| 11            | Loquat                         | Eriobotrya japonica               | Evergreen Small Tree    | Beautiful trees, foliage and fruit trees    | Parks, residential areas            |
| 12            | Platanus                       | Platanus orientalis               | Large Deciduous Tree    | Strong adaptability, strong resistance to a variety of toxic | Parks, residential areas, industrial areas |

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| No. | Species                  | Genus                   | Type           | Characteristics                                                                 | Locations                                |
|-----|--------------------------|-------------------------|----------------|--------------------------------------------------------------------------------|------------------------------------------|
| 14  | Sophora japonica         | Sophora                 | Deciduous tree | Strong resistance to harmful gases such as Cl₂ and SO₂                         | Parks, streets, residential areas, industrial areas |
| 15  | Paulownia fortunei      | Paulownia              | Deciduous tree | Can absorb dust and smoke, anti-toxic gas                                      | Parks, streets, residential areas, industrial areas |
| 16  | Apricot                  | Armeniaca              | Deciduous tree | Flower and fruit tree species                                                   | Parks, residential areas, industrial areas |
| 17  | Paper mulberry           | Broussonetia            | Deciduous tree | Strong adaptability, strong resistance to harmful gases such as Cl₂ and SO₂   | Parks, residential areas, industrial areas |
| 18  | Ulmus pumila             | Ulmus                  | Deciduous tree | Strong resistance                                                              | Parks, residential areas, industrial areas |
| 19  | Chinese Tallow           | Triadica               | Deciduous tree | Barren resistance, strong resistance to HF gas                                  | Parks, streets, residential areas, industrial areas |
| 20  | Melia azedarach          | Melia                  | Deciduous tree | Resistant to smoke and dust, strong against SO₂                                | Parks, residential areas, industrial areas |
| 21  | Ailanthus altissima      | Ailanthus              | Deciduous tree | Strong anti-smoke ability, extremely resistant to Cl₂, SO₂, nitrogen dioxide, HF gas | Parks, streets, residential areas, industrial areas |
| 22  | Toon                     | Toona                  | Deciduous tree | Cold resistance                                                                | Streets, residential areas, industrial areas |
| 23  | Hovenia dulcis           | Hovenia                | Deciduous tree | Strong adaptability                                                            | Parks, residential areas, industrial areas |
| 24  | Albizia                  | Albizia                | Deciduous tree | Strong resistance to harmful gases such as SO₂ and hydrogen chloride            | Parks, streets, residential areas, industrial areas |
| 25  | Ash tree                 | Fraxinus               | Deciduous tree | Anti-smoke, SO₂ and Cl₂                                                         | Parks, streets, waterfronts, residential areas, industrial areas |
| 26  | Metasequoia              | Metasequoia            | Deciduous tree | Some resistance                                                                | Parks, streets, |
| No. | Species 1                        | Species 2                        | Type              | Use                          |
|-----|---------------------------------|---------------------------------|-------------------|------------------------------|
| 27  | Acer truncatum                   | Acer truncatum                   | Deciduous tree    | Foliage tree species         |
|     |                                 |                                 |                   | Parks, streets, residential  |
|     |                                 |                                 |                   | areas, industrial areas      |
| 28  | Acer monoes                      | Acer pictum subsp. mono          | Deciduous tree    | Absorb smoke, dust and       |
|     |                                 |                                 |                   | harmful gases, fire-proof    |
|     |                                 |                                 |                   | tree species                 |
|     |                                 |                                 |                   | Parks, streets, residential  |
|     |                                 |                                 |                   | areas, industrial areas      |
| 29  | Bischofia javanica               | Bischofia polycarpa              | Deciduous tree    | Absorb smoke and dust, strong |
|     |                                 |                                 |                   | anti-pollution ability       |
|     |                                 |                                 |                   | Parks, streets, waterfronts, |
|     |                                 |                                 |                   | residential areas,           |
|     |                                 |                                 |                   | industrial areas             |
| 30  | Ginkgo biloba                    | Ginkgo biloba                    | Deciduous tree    | Foliage tree species         |
|     |                                 |                                 |                   | Parks, streets, residential  |
|     |                                 |                                 |                   | areas                        |
| 31  | Acer palmatum                    | Acer palmatum                    | Deciduous tree    | Strong resistance to SO₂ and |
|     |                                 |                                 |                   | smoke                        |
|     |                                 |                                 |                   | Parks, streets, residential  |
|     |                                 |                                 |                   | areas, industrial areas      |
| 32  | Rhododendron repens              | Euonymus maackii                 | Deciduous tree    | Moderate resistance to SO₂   |
|     |                                 |                                 |                   | Parks, streets, waterfronts, |
|     |                                 |                                 |                   | residential areas            |
| 33  | Cotinus coggygria                | Cotinus coggygria                | Deciduous tree    | Extremely resistant to       |
|     |                                 |                                 |                   | infertility                  |
|     |                                 |                                 |                   | Parks, streets, residential  |
|     |                                 |                                 |                   | areas                        |
| 34  | Crape myrtle                     | Lagerstroemia indica             | Deciduous tree    | Reduce dust and absorb       |
|     |                                 |                                 |                   | harmful gases such as SO₂,   |
|     |                                 |                                 |                   | Cl₂ and HF                   |
|     |                                 |                                 |                   | Parks, streets, waterfronts, |
|     |                                 |                                 |                   | residential areas            |
|     |                                 |                                 |                   | industrial areas             |
| 35  | Purple Leaf Plum                 | Prunus cerasifera f. atropurpurea| Deciduous tree    | Adaptable                    |
|     |                                 |                                 |                   | Parks, streets, residential  |
|     |                                 |                                 |                   | areas                        |
| 36  | Pomegranate                      | Punica granatum                  | Deciduous tree    | Flower and fruit tree species|
|     |                                 |                                 |                   | Parks, streets, waterfronts, |
|     |                                 |                                 |                   | residential areas            |
|     |                                 |                                 |                   | industrial areas             |
| 37  | Koelreuteria Paniculata          | Koelreuteria paniculata          | Deciduous tree    | Strong resistance to dust,   |
|     |                                 |                                 |                   | SO₂ and ozone                |
|     |                                 |                                 |                   | Parks, streets, residential  |
|     |                                 |                                 |                   | areas, industrial areas      |
| 38  | Pyracantha fortuneana            | Pyracantha fortuneana            | Evergreen shrub   | Strong absorption and         |
|     |                                 |                                 |                   | resistance to SO₂            |
|     |                                 |                                 |                   | Parks, streets, residential  |
|     |                                 |                                 |                   | areas, industrial areas      |
| 39  | Serissa japonica 'Variegata'     | Serissa japonica 'Variegata'     | Evergreen shrub   | Foliage tree species         |
|     |                                 |                                 |                   | Parks, streets, residential  |
|     |                                 |                                 |                   | areas                        |
| 40  | Buxus japonicus                  | Buxus bodinieri                  | Evergreen shrub   | Foliage tree species         |
|     |                                 |                                 |                   | Parks, streets, residential  |
|     |                                 |                                 |                   | areas                        |
| No. | Species                              | Type                      | Characteristics                                                                 | Areas                          |
|-----|-------------------------------------|---------------------------|---------------------------------------------------------------------------------|--------------------------------|
| 41  | Phyllostachys heterocycla           | Evergreen shrub           | Adaptable, foliage and fruit tree species                                        | Parks, residential areas      |
|     | Nandina domestica                   |                           |                                                                                 |                                |
| 42  | Jasminum mesnyi                     | Evergreen shrub           | Flower tree species                                                              | Parks, residential areas      |
|     | Jasminum mesnyi                     |                           |                                                                                 |                                |
| 43  | Nerium oleander                     | Evergreen erect large shrub | Strong resistance to SO$_2$, carbon dioxide, HF, Cl$_2$ and other harmful gases | Parks, streets, waterfronts, residential areas, industrial areas |
|     | Nerium oleander                     |                           |                                                                                 |                                |
| 44  | Procumbent juniper                  | Evergreen creeping small shrub | Anti-smoke, anti-SO$_2$, hydrogen chloride and other harmful gases                | Parks, streets, residential areas, industrial areas |
|     | Juniperus procumbens                |                           |                                                                                 |                                |
| 45  | Pittosporum tobira                  | Evergreen shrubs or small trees | Strong resistance to SO$_2$, HF, Cl$_2$ and other toxic gases                    | Parks, streets, residential areas, industrial areas |
|     | Pittosporum tobira                  |                           |                                                                                 |                                |
| 46  | Fatsia japonica                     | Evergreen shrubs or small trees | Strong resistance to SO$_2$                                                     | Parks, streets, residential areas, industrial areas |
|     | Fatsia japonica                     |                           |                                                                                 |                                |
| 47  | Ilex cornuta                        | Evergreen shrubs or small trees | Tree species for foliage and flower viewing                                    | Parks, residential areas      |
|     | Ilex cornuta                        |                           |                                                                                 |                                |
| 48  | Photinia fraser                     | Evergreen shrubs or small trees | Foliage tree species                                                           | Parks, streets, residential areas, industrial areas |
|     | Photinia × fraseri                  |                           |                                                                                 |                                |
| 49  | Redflowered Loropetalum             | Evergreen shrubs or small trees | Adaptable, foliage tree species                                                  | Parks, streets, residential areas, industrial areas |
|     | Loropetalum chinense var. rubrum    |                           |                                                                                 |                                |
| 50  | Melon seeds Cyclovirobuxine         | Evergreen shrubs or small trees | Foliage tree species                                                           | Parks, streets, residential areas, industrial areas |
|     | Buxus sinica                        |                           |                                                                                 |                                |
| 51  | Ligustrum quihoui                   | Semi-evergreen shrub      | Resistance to a variety of toxic gases                                           | Parks, streets, residential areas, industrial areas |
|     | Ligustrum quihoui                   |                           |                                                                                 |                                |
| 52  | Forsythia suspensa                  | Deciduous shrub           | Strong cold resistance                                                           | Parks, streets, waterfronts, residential areas |
|     | Forsythia suspensa                  |                           |                                                                                 |                                |
| 53  | Chaenomeles lagenaria               | Deciduous shrub           | Flower tree species                                                              | Parks, residential areas      |
|     | Chaenomeles speciosa                |                           |                                                                                 |                                |
| 54  | Berberis thunbergii                 | Deciduous shrub           | Adaptable, foliage tree species                                                  | Parks, streets, residential areas, industrial areas |
|     | Berberis thunbergii 'Atropurpurea'  |                           |                                                                                 |                                |
| 55  | Bauhinia                            | Deciduous shrub           | Flower tree species                                                              | Parks, residential areas      |
|     | Cercis chinensis                    |                           |                                                                                 |                                |
| No. | Common Name         | Scientific Name | Plant Type         | Characteristics                                                                                      | Suitable Areas                        |
|-----|---------------------|-----------------|--------------------|-----------------------------------------------------------------------------------------------------|---------------------------------------|
| 56  | False indigo        | Amorpha fruticosa | Deciduous shrub    | Strong wind resistance                                                                             | Parks, residential areas              |
| 57  | Vitex negundo       | Vitex negundo   | Deciduous shrubs or small trees | Tree species for foliage and flower viewing                                                        | Parks, streets, residential areas     |
| 58  | Lilac               | Syringa oblata  | Deciduous shrubs or small trees | Tolerant to barren, cold and drought                                                             | Parks, streets, residential areas, industrial areas |
| 59  | Chinese rose        | Rosa chinensis  | Standing shrub     | Cold resistance, drought resistance, strong resistance to harmful gases                            | Parks, streets, residential areas, industrial areas |
| 60  | Japanese spiraea    | Spiraea japonica| Standing shrub     | Tolerant to cold, drought, and barren                                                            | Parks, streets, waterfronts, residential areas |
| 61  | Creeping oxalis     | Oxalis corniculata | Herb              | Strong adaptability to soil                                                                        | Ground cover                          |
| 62  | Zoysia matrella     | Zoysia matrella | Perennial herb     | Fine grass                                                                                         | Ground cover                          |
| 63  | Arab Speedwell      | Veronica persica| Spread multi-branched herbs | Flower plant                                                                                      | Ground cover                          |
| 64  | Bermudagrass        | Cynodon dactylon| Perennial low herb | Good soil-retaining plants                                                                         | Ground cover                          |
| 65  | Ophiopogon japonicus| Ophiopogon japonicus | Perennial evergreen grass | Cold and drought tolerant                                                                         | Ground cover                          |
| 66  | Lotus               | Nelumbo nucifera| Perennial aquatic herb | Important water environment restoration plant                                                      | Parks, waterfronts, residential areas |
| 67  | Reed                | Phragmites australis | Tall perennial or wet grass | Play an important role in the purification of sewage                                              | Parks, waterfronts                    |
| 68  | Calamus             | Acorus calamus  | Perennial herb     | Ornamental plants                                                                                 | Park, waterfronts                     |
| 69  | Carbungi            | Typha angustifolia| Perennial aquatic or marsh herb | Good purification effect in sewage treatment                                                      | Park, waterfronts                     |
| 70  | Lotos               | Nymphaea tetragona | Perennial aquatic herb | Can absorb Pb, Hg, phenol and other toxic substances in water                                     | Parks, waterfronts, residential areas |
| 71  | Thalia dealbata     | Thalia dealbata  | Perennial emergent herb | Purified water quality                                                                            | Parks, waterfronts, residential areas |