

Diversity Analysis of Ground Cover Plant Communities of Seven Forest Parks in Guangzhou

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Abstract

Taking the ground cover plants of seven forest parks in Guangzhou as the research object, a total of 79 quadrats were set up, and the frequency of plant occurrences in the quadrats was counted. It belongs to 58 families and 90 genera, including 41 species of herbs, belonging to 25 families and 39 genera; 54 species of woody plants, belonging to 34 families and 47 genera; 1 species of vines, belonging to 1 family and 1 genus; 3 species of ferns, belonging to 3 families and 3 species. The frequency of plant appearance showed that the ground cover in Guangzhou Park was dominated by herbs, with more woody plants and fewer ferns and vines. Herbaceous plants are mainly foliage plants, and there are few coleus plants; there are more coleus plants in woody plants. There are various types of ornamental plants, flexible plant collocation, and rich landscaping levels. Provide data reference for the application of ground cover plants in urban park green space landscape construction.

Keywords

Guangzhou, Plants, Species, Diversity

1. Introduction

In the traditional concept, ground cover refers to all plants that can cover the ground are called ground cover, including herbs, dwarf bushes in woody, weir-like or semi-vine shrubs or vines (Chen, 1988). Yu Yang and Qin Kuijie that ground cover generally refers to low plant community, there is coverage (Wang & Qin, 1990). Zhou Hougao defined ground cover plants as ornamental plants that cover, green, beautify the ground, and construct the lowest level landscape of green space in terms of their functions (Zhou, 2006).

The research on ground cover plants started late, but in recent decades, a lot of research work on garden ground cover plants has been carried out at home and abroad, and some progress has also been made (Hu, 2001; Wei, 1994; Zhang, & Xia, 2003; An, 2007; Shi, 2002; Fukushima & Li, 2002). The research mainly focuses on several aspects: the investigation, introduction and screening of ground cover plants. The domestic related research began after 1970, and the foreign countries were slightly earlier than the domestic ones. Both of them have achieved relatively rich results. Domestic research provides a major theoretical basis for the development of ground cover plants in my country, and is also of great significance in ground cover planting; research on the adaptability and tolerance of ground cover plants, mainly to study the shade tolerance, cold tolerance and salt and alkali tolerance of plants Sex (Cao, 2015). Foreign scholars have observed the effects of temperature and salinity on the growth of ground cover plants through experiments, and proposed corresponding solutions.

Some scholars pay attention to the application of plant species diversity in urban green spaces, and investigate the plants in urban parks. For example, Shi et al. (2010) investigated the community characteristics and plant diversity of park plants in the central urban area of Shanghai. As a national central city, Guangzhou is weak in the application of garden and green space plants. Therefore, through the investigation and analysis of park plants in 7 different areas and construction time in Guangzhou, this paper aims to provide reference data for the rational application and promotion of park plants in Guangzhou in the future.

2. Materials and Methods

2.1. Materials

Guangzhou is located between 112 degrees 57 minutes to 114 degrees 3 minutes east longitude and 22 degrees 26 minutes to 23 degrees 56 minutes north latitude. There are abundant light and heat resources in this area. The annual average sunshine hours exceed 1500 hours, and the annual average temperature is 21.4°C ~ 22.0°C. The temperature in July is the highest, the average is 28.7°C, and the lowest in January is 14.0°C. The annual average precipitation is 1784 mm, and the annual average relative humidity is 75%; the frost free period is more than 340 days.

The survey was conducted from February 1 to June 1, 2019. The investigation of species composition adopts the method of minimum area to count the species list of a community. Ground cover is an indispensable part of landscaping, especially the greening of parks plays an important role. By studying the ground cover plants in various parks, this paper analyzes the application of ground cover plants and the landscape construction of ground cover plants, and lays the foundation for the application research of garden ground cover plants in Guangzhou parks.

The ground cover plants used in this paper are “plants with a growth height below 1m, dense branches and leaves, planted in patches, with strong expansion ability, and can cover the ground” (Song, 2001). The main parks in Guangzhou were inspected, and seven comprehensive parks in Guangzhou were finally selected after comprehensive consideration and combination of the characteristics of each park. The seven selected parks are located in various districts of Guangzhou, with high reputation and large flow of people. They are Yuexiu Park, Xiaogang Park, Liuhua Lake Park, Pearl River Park, Tianhe Park, Guangzhou Cultural Park, and Dongshan Lake Park.

The above seven parks are large-scale comprehensive parks in Guangzhou and occupy an important position in the park green space in Guangzhou. There are many kinds of plants in the garden, and the existing vegetation is a mixture of artificial plants and natural secondary vegetation. This paper investigates and studies these plant communities and analyzes the plant diversity of park green space in urban green space, in order to provide experience for park green space construction.

2.2. The Quadrat Setting and Survey

Quadrat setting refer to the principles of comprehensiveness, representativeness, and typicality (Wang & Deng, 2014; Liu & Mao, 2012; Zhu, 2002). In seven parks including Yuexiu Park, Tianhe Park, and Liuhua Lake Park in Guangzhou, the ground cover plants at various locations in the park were selected. In the landscaping area, a 10 m × 10 m quadrat was set up. A total of 79 quadrats were investigated. The types of groundcover plants in the quadrat were counted, photographs of the groundcover plant landscape were taken, and the collocation of groundcover plants was recorded and analyzed.

2.3. Number of Occurrences and Frequency Calculation

The frequency of occurrence of a certain plant = $n/N \times 100\%$, n is the number of occurrences of a certain plant, and N is the total number of surveyed fields.

3. Results

3.1. Composition of Ground Cover Plants

According to the investigation, among the seven comprehensive parks in Guangzhou, there are 99 species of ground cover plants in parks, belonging to 58 families and 90 genera. Among them, 41 species of herbs belong to 25 families and 39 genera. There are 54 species of woody plants, belonging to 34 families and 47 genera, 1 species of vine, belonging to 1 family and 1 genus. There are 3 species of ferns, belonging to 3 families and 3 species (Table 1).

3.2. Frequency Analysis

According to the survey and statistics, among the seven Guangzhou parks, there are 99 kinds of ground cover plants, of which the frequency is more than 15

Table 1. Number of occurrences and frequency of plants.

Ordinal	Latin name	Number of occurrences	Frequency (%)
1	<i>Clerodendrum japonicum</i> (Thunb.) Sweet	1	1.27
2	<i>Clerodendrum quadriloculare</i>	1	1.27
3	<i>Duranta repens</i> L.	15	18.99
4	<i>Lantana montevidensis</i> B.	1	1.27
5	<i>Olea ferruginea</i> R.	2	2.53
6	<i>Osmanthus fragrans</i> (Thunb.) Lour.	1	1.27
7	<i>Ligustrum lucidum</i> A.	1	1.27
8	<i>Osmanthus fragrans</i> var. <i>sempervlorens</i>	5	6.33
9	<i>Chamaerops humilis</i>	1	1.27
10	<i>Chrysalidocarpus lutescens</i> H. Wendl.	2	2.53
11	<i>Trachycarpus fortunei</i> (Hook.) H. Wendl.	1	1.27
12	<i>Rhapis excelsa</i> (Thunb.) Henry ex Rehd.	15	18.99
13	<i>Codiaeum variegatum</i> (L.) A. Juss	2	2.53
14	<i>Excoecaria cochinchinensis</i> Lour.	15	18.99
15	<i>Jatropha pandurifolia</i>	1	1.27
16	<i>Albizia julibrissin</i> Durazz.	1	1.27
17	<i>Bauhinia galpinii</i> N.E. Brown.	1	1.27
18	<i>Calliandra haematocephala</i> Hassk.	2	2.53
19	<i>Ficus concinna</i> (Miq.) Miq.	1	1.27
20	<i>Ficus hispida</i> Linn.	1	1.27
21	<i>Ficus microcarpa</i> cv. <i>Golden Leaves</i>	2	2.53
22	<i>Hibiscus mutabilis</i> Linn	1	1.27
23	<i>Hibiscus Rosa-sinensis</i> L. Cv. 'Cooper'	1	1.27
24	<i>Hibiscus rosasinensis</i> Linn	2	2.53
25	<i>Dracaena angustifolia</i>	4	5.06
26	<i>Cordyline fruticosa</i> (L.) A. Cheval.	26	32.91
27	<i>Cordylinefruticosa</i>	2	2.53
28	<i>Callistemon rigidus</i> R. Br.	2	2.53
29	<i>Syzyglum hancei</i> Merr Et Perry	1	1.27
30	<i>Ixora chinensis</i> Lam.	8	10.13
31	<i>Gardenia jasminoides</i>	5	6.33
32	<i>Ervatamia divaricata</i> (L.) Burk.	1	1.27
33	<i>Allemanda neriifolia</i> Hook.	2	2.53

Continued

34	<i>Loropetalum chinense</i> var. <i>rubrum</i> Yieh	14	17.72
35	<i>Rhododendron simsii</i> Planch.	6	7.59
36	<i>Pittosporum tobira</i> (Thunb.) Ait.	10	12.66
37	<i>Sanchezia speciosa</i> J.Leonard	7	8.86
38	<i>Aglaia odorata</i> Lour.	6	7.59
39	<i>Pandanus tectorius</i> Sol	1	1.27
40	<i>Schefflera octophylla</i> (Lour.) Harms	17	21.51
41	<i>Michelia figo</i> (Lour.) Spreng.	10	12.66
42	<i>Cuphea hookeriana</i> Walp.	2	2.53
43	<i>Malus. Chaenomeles</i>	6	7.59
44	<i>Camellia japonica</i> L	6	7.59
45	<i>Cycas revoluta</i> Thunb.	4	5.06
46	<i>Buxus megistophylla</i>	2	2.53
47	<i>Schefflera octophylla</i> (Lour.) Harms	32	40.51
48	<i>Nandina domestica</i> Thunb.	2	2.53
49	<i>Tibouchina seecandra</i> Cogn.	2	2.53
50	<i>Murraya exotica</i> L.	4	5.06
51	<i>Zamia furfuracea</i> Ait.	1	1.27
52	<i>Litsea pungens</i> Hemsl.	1	1.27
53	<i>Carmona microphylla</i> (Lam.) Don.	3	3.80
54	<i>Bougainvillea glabra</i> Choisy	15	18.99
55	<i>Zephyranthes candida</i> (Lindl.) Herb.	2	2.53
56	<i>Agave americana</i> L.	5	6.33
57	<i>Hymenocallis littoralis</i> (Jacq.) Salisb.	8	10.13
58	<i>Crinum asiaticum</i> L. var. <i>sinicum</i> (Roxb. ex Herb.) Baker	11	13.92
59	<i>Curculigo capitulata</i>	3	3.80
60	<i>Monstera deliciosa</i>	3	3.80
61	<i>Alocasia macrorrhiza</i> (L.)	10	12.66
62	<i>Syngonium podophyllum</i> Schott	11	13.92
63	<i>Philodenron selloum</i> Koch	15	18.99
64	<i>Philodendron xanadu</i> Croat, Mayo et Boos	1	1.27
65	<i>Reineckia carnea</i> (Andr.) Kunth	5	6.33
66	<i>Ophiopogon bodinieri</i>	18	22.78
67	<i>Aspidistra elatior</i> Bl.	4	5.06
68	<i>Tradescantia zebrina</i> Bosse	6	7.59

Continued

69	<i>Rhoeo spathaceo</i> cv“ <i>Compacta</i> ”	1	1.27
70	<i>Wedelia chinensis</i> (Osbeck.) Merr.	4	5.06
71	<i>Tagetes erecta</i> L	1	1.27
72	<i>Gendarssa vulgaris</i> Nees	1	1.27
73	<i>Ruellia brittoniana</i> Leonard	13	16.46
74	<i>Alpinia zerumbet</i> ‘ <i>Variegata</i> ’	22	27.85
75	<i>Alpinia japonica</i> (Thunb.) Miq.	4	5.06
76	<i>Stromanthe sanguinea</i> Sond.	11	13.92
77	<i>Calathea makoyana</i> E. Morr.	3	3.80
78	<i>Clinopodium urticifolium</i> (Hance) C. Y. Wu et Hsuan	3	3.80
79	<i>Salvia japonica</i> Thunb.	1	1.27
80	<i>Arachis duranensis</i>	1	1.27
81	<i>Axonopus compressus</i> (Sw.) P. Beauv.	1	1.27
82	<i>Hydrangea macrophylla</i> (Thunb.) Ser.	1	1.27
83	<i>Viola tricolor</i> L.	1	1.27
84	<i>Kalanchoe blossfeldiana</i> Poelln.	1	1.27
85	<i>Dracaena sanderiana</i> Sander	1	1.27
86	<i>Pelargonium hortorum</i> Bailey	2	2.53
87	<i>Canna indica</i> L.	2	2.53
88	<i>Petunia hybrida</i> (J. D. Hooker) <i>Vilmorin</i>	1	1.27
89	<i>Hydrocotyle vulgaris</i>	1	1.27
90	<i>Dianthus chinensis</i> L.	2	2.53
91	<i>Chlorophytum comosum</i> (Thunb.) Baker	3	3.80
92	<i>Iris tectorum</i>	11	13.92
93	<i>Alternanthera sessilis</i> (L.) DC.	1	1.27
94	<i>Pilea notata</i> C. H. Wright	18	22.78
95	<i>Oxalis pes-caprae</i> L.	1	1.27
96	<i>Cyclosorus parasiticus</i> (L.) Farwell.	2	2.53
97	<i>Dicranopteris dichotoma</i> (Thunb.) Bernh.	8	10.13
98	<i>Nephrolepis auriculata</i> (L.) Trimen	6	7.59
99	<i>Piper hancei</i> Maxim.	6	7.59

times (including 15 times), and there are 11 kinds of plant species with a frequency of more than 10%, namely *Pilea notata* CH Wright, *Alpinia zerumbet* ‘*Variegata*’, *Philodendron selloum* Koch, *Ophiopogon bodinieri*, *Excoecaria cochinchinensis* Lour., *Schefflera octophylla* (Lour.) Harms), *Schefflera octophylla*

(Lour.) Harms, *False Forsythia* (*Duranta repens* Linn.), *Bougainvillea glabra* Choisy, *Cordyline fruticosa* (L.) A. Cheval., *Palm Bamboo* (*Rhapis excelsa* (Thunb.) Henry ex Rehd.). Among the 99 species of plants in the 79 plots obtained from the survey, only 11 species of plants have a frequency of more than 15 times, which reflects that the types of ground cover plants used in Guangzhou Park are relatively rich (**Table 1**).

3.3. Application Analysis of Ground Cover

3.3.1. Application Analysis of Herb Ground Cover

As can be seen from **Table 2**, the types of herbs in the ground cover in Guangzhou Park are relatively rich, with 11 kinds of herbs being used more than 10% of the time. Among them, only 3 kinds of plants are sun plants, indicating that the ground cover plants in Guangzhou Comprehensive Park are mostly used in the environment with less light. The top three plants with the highest frequency are all native plant species, and the utilization rate of native plants is high. There are 41 species of herbaceous plants, including 15 shade plants, 14 shade tolerant plants, 12 sun plants, 20 flower watching plants and 40 leaf watching plants. These plants create a rich landscape and show different color changes in plant ornamental (**Table 2**).

As far as the ornamental types of herbs are concerned, foliage plants: flower plants: other = 40:20:19, indicating that the ornamental types of herbs are mainly foliage plants, and the application frequency of most plants is below 10%, indicating that Guangzhou. The application of ground cover plant species in the park is not very repetitive, and the ground cover plant species is rich.

The characteristics of herbal applications can be summarized as follows: native plants are used frequently, and native plants can greatly reduce the management cost of parks due to their adaptability to the native environment; the growth habits of ground cover plants are mainly shaded or shade-tolerant, It shows that the growing environment of ground cover plants in Guangzhou Park is mostly under the shade of trees or beside buildings and other environments with less light (**Table 2**).

3.3.2. Analysis of Woody Ground Cover

From **Table 3**, it can be seen that the woody plant species of Guangzhou park ground cover are relatively rich. There are 54 species of woody plants, including 13 shade plants, 18 shade tolerant plants, 23 sun plants, 36 flower watching plants and 52 leaf watching plants. These plants create a rich landscape and show different color changes in plant ornamental (**Table 3**).

Among the 54 kinds of woody plants obtained in the survey, 11 kinds of woody plants are used. The frequency is more than 10%, and most of them are shade or shade-tolerant plants, similar to the application of herbaceous cover plants. Foliage plants:Floral plants:other = 52:36:44, the ornamental types of woody plants are mainly foliage plants, most of which have various ornamental properties.

Table 2. Application characteristics of herbaceous groundcovers.

Ordinal	Plant Species	Shade	Shade Tolerance	love sun plants	Flower Viewing	Foliage Viewing	Other	Number of occurrences	Frequency (%)
1	<i>Reineckia carnea</i> (Andr.) Kunth	√				√		5	6.33
2	<i>Ophiopogon bodinieri</i>	√				√		18	22.78
3	<i>Aspidistra elatior</i> Bl.	√			√	√	√	4	5.06
4	<i>Clinopodium urticifolium</i> (Hance) C. Y. Wu et Hsuan	√				√	√	3	3.80
5	<i>Salvia japonica</i> Thunb.		√		√	√		1	1.27
6	<i>Arachis duranensis</i>		√		√	√		1	1.27
7	<i>Axonopus compressus</i> (Sw.) P. Beauv			√		√		1	1.27
8	<i>Hydrangea macrophylla</i> (Thunb.) Ser.	√			√	√	√	1	1.27
9	<i>Alpinia zerumbet</i> 'Variegata'		√		√	√	√	22	27.85
10	<i>Alpinia japonica</i> (Thunb.) Miq.	√				√		4	5.06
11	<i>Viola tricolor</i> L.			√	√			1	1.27
12	<i>Kalanchoe blossfeldiana</i> Poelln.			√	√	√		1	1.27
13	<i>Wedelia chinensis</i> (Osbeck.) Merr.		√		√	√		4	5.06
14	<i>Tagetes erecta</i> L.			√	√	√		1	1.27
15	<i>Gendarssa vulgaris</i> Nees	√				√		1	1.27
16	<i>Ruellia brittoniana</i> Leonard			√	√	√		13	16.46
17	<i>Dracaena sanderiana</i> Sander		√			√		1	1.27
18	<i>Pelargonium hortorum</i> Bailey			√	√	√		2	2.53
19	<i>Canna indica</i> L.			√	√	√		2	2.53
20	<i>Petunia hybrida</i> (J. D. Hooker) Vilmorin			√	√	√	√	1	1.27
21	<i>Hydrocotyle vulgaris</i>	√				√	√	1	1.27
22	<i>Zephyranthes candida</i> (Lindl.) Herb.		√			√		2	2.53
23	<i>Agave americana</i> L.			√		√		5	6.33
24	<i>Hymenocallis littoralis</i> (Jacq.) Salisb.			√		√	√	8	10.13
25	<i>Crinum asiaticum</i> L. var. <i>sinicum</i> (Roxb. ex Herb.) Baker			√		√	√	11	13.92
26	<i>Curculigo capitulata</i>		√			√	√	3	3.80
27	<i>Dianthus chinensis</i> L.		√		√	√	√	2	2.53
28	<i>Chlorophytum comosum</i> (Thunb.) Baker		√			√	√	3	3.80
29	<i>Monstera deliciosa</i>	√				√	√	3	3.80
30	<i>Alocasia macrorrhiza</i> (L.)	√				√	√	10	12.66
31	<i>Syngonium podophyllum</i> Schott		√			√	√	11	13.92

Continued

32	<i>Philodendron selloum</i> Koch	√			√	√	15	18.99
33	<i>Philodendron xanadu</i> Croat, Mayo et Boos	√			√	√	1	1.27
34	<i>Alternanthera sessilis</i> (L.) DC.	√			√	√	1	1.27
35	<i>Pilea notata</i> C. H. Wright		√		√	√	18	22.78
36	<i>Tradescantia zebrina</i> Bosse	√			√	√	6	7.59
37	<i>Rhoeo spathaceo</i> cv 'Compacta'			√	√	√	1	1.27
38	<i>Iris tectorum</i>		√		√	√	11	13.92
39	<i>Stromanthe sanguinea</i> Sond.	√				√	11	13.92
40	<i>Calathea makoyana</i> E. Morr.		√			√	3	3.80
41	<i>Oxalis pescaprae</i> L.		√		√	√	1	1.27

Table 3. Application characteristics of woody ground cover plants.

Ordinal	Plant Species	Shade	Shade Tolerance	love sun plants	Flower Viewing	Foliage Viewing	Other	Number of occurrences	Frequency (%)
1	<i>Codiaeum variegatum</i> (L.) A. Juss			√		√	√	2	2.53
2	<i>Excoecaria cochinchinensis</i> Lour.	√			√	√	√	15	18.99
3	<i>Jatropha pandurifolia</i>			√	√	√	√	1	1.27
4	<i>Albizia julibrissin</i> Durazz.			√	√	√	√	1	1.27
5	<i>Bauhinia galpinii</i> N.E. Brown.		√		√	√	√	1	1.27
6	<i>Calliandra haematocephala</i> Hassk.			√	√	√		2	2.53
7	<i>Rhododendron simsii</i> Planch.	√			√		√	6	7.59
8	<i>Pittosporum tobira</i> (Thunb.) Ait.			√		√		10	12.66
9	<i>Ervatamia divaricata</i> (L.) Burk.	√			√	√	√	1	1.27
10	<i>Allemanda nerifolia</i> Hook.			√	√	√	√	2	2.53
11	<i>Loropetalum chinense</i> var. <i>rubrum</i> Yieh	√			√	√	√	14	17.72
12	<i>Hibiscus mutabilis</i> L.		√		√		√	1	1.27
13	<i>Hibiscus Rosa-sinensis</i> L. Cv. 'Cooper'			√	√	√	√	1	1.27
14	<i>Hibiscus rosasinensis</i> L.			√	√	√	√	2	2.53
15	<i>Sanchezia speciosa</i> J. Leonard	√				√	√	7	8.86
16	<i>Aglaia odorata</i> Lour.			√	√	√	√	6	7.59
17	<i>Dracaena angustifolia</i>			√		√	√	4	5.06
18	<i>Cordyline fruticosa</i> (L.) A. Cheval.		√		√	√		26	32.91

Continued

19	<i>Cordvlinefruticosa</i>		√		√	√	2	2.53
20	<i>Pandanus tectorius</i> Sol			√	√	√	1	1.27
21	<i>Clerodendrum japonicum</i> (Thunb.) Sweet	√			√	√	1	1.27
22	<i>Clerodendrum quadriloculare</i>		√		√		1	1.27
23	<i>Duranta repens</i> L.		√	√	√	√	15	18.99
24	<i>Lantana montevidensis</i> B.			√	√	√	1	1.27
25	<i>Schefflera octophylla</i> (Lour.) Harms		√		√	√	17	21.52
26	<i>Michelia figo</i> (Lour.) Spreng.	√			√	√	10	12.66
27	<i>Olea ferruginea</i> R.		√		√		2	2.53
28	<i>Osmanthus fragrans</i> (Thunb.) Lour.			√	√	√	1	1.27
29	<i>Ligustrum lucidum</i> A.		√		√	√	1	1.27
30	<i>Osmanthus fragrans</i> var. <i>semperflorens</i>			√	√	√	5	6.33
31	<i>Cuphea hookeriana</i> Walp.		√		√	√	2	2.53
32	<i>Ixora chinensis</i> Lam.			√	√	√	8	10.13
33	<i>Gardenia jasminoides</i>		√		√	√	5	6.33
34	<i>Malus. Chaenomeles</i>		√		√	√	6	7.59
35	<i>Ficus concinna</i> (Miq.)			√	√	√	1	1.27
36	<i>Ficus hispida</i> Linn.	√			√	√	1	1.27
37	<i>Ficus microcarpa</i> cv. Golden Leaves		√		√	√	2	2.53
38	<i>Camellia japonica</i> L		√		√	√	6	7.59
39	<i>Cycas revoluta</i> Thunb.		√		√	√	4	5.06
40	<i>Callistemon rigidus</i> R. Br.			√	√	√	2	2.53
41	<i>Syzyglum hancei</i> Merr Et Perry			√	√	√	1	1.27
42	<i>Buxus megistophylla</i>			√		√	2	2.53
43	<i>Schefflera octophylla</i> (Lour.) Harms		√		√	√	32	40.51
44	<i>Nandina domestica</i> Thunb.	√			√	√	2	2.53
45	<i>Tibouchina seecandra</i> Cogn.	√			√	√	2	2.53
46	<i>Murraya exotica</i> L.			√	√	√	4	5.06
47	<i>Zamia furfuracea</i> Ait.		√		√		1	1.27
48	<i>Litsea pungens</i> Hemsl.			√		√	1	1.27

Continued

49	<i>Carmona microphylla</i> (Lam.) Don.	√		√	√	√	3	3.80
50	<i>Bougainvillea glabra</i> Choisy		√	√	√	√	15	18.99
51	<i>Chamaerops humilis</i>		√		√		1	1.27
52	<i>Chrysalidocarpus lutescens</i> H. Wendl.	√		√	√	√	2	2.53
53	<i>Trachycarpus fortunei</i> (Hook.) H. Wendl.		√	√	√	√	1	1.27
54	<i>Rhapis excelsa</i> (Thunb.) Henry ex Rehd.	√		√	√	√	15	18.99

The overall characteristics of woody plants can be summarized into the following points: woody plants are rich in ornamental qualities. Flowers, leaves, branches and trunks of various plants have unique ornamental qualities. Compared with herbs, the proportion of ground cover plants with coleus plants has increased significantly. The use of coleus plants can effectively break the depressing environment in a low-light environment.

4. Discussion

Based on the classification of ground cover plants and the related theory of ground cover plant landscape construction. Seven representative comprehensive parks were selected, and 79 quadrats were set up. The plant species in the quadrats were recorded, and the plant configuration was photographed and analyzed. Through research, the ground cover species are classified as herbs, woody, vines and ferns. Through the analysis of the survey data, the following conclusions are drawn.

The ground cover plants in Guangzhou Park are mainly herbs and woody plants, and ferns and vines are only a few. The proportion of leafy plants is small, most of them are shade-tolerant or shade plants, and the proportion of woody plants is relatively large.

A variety of plants of the same color can be used for planting in plant pieces, which will not affect the landscape effect but also increase the species diversity of the plant community. When mixing and planting plants, it is not advisable to choose too many plants, which can create a sense of hierarchy, and the primary and secondary can be clearly defined.

Most parks have unreasonable planting arrangements at the initial stage of planting, and some plants grow poorly due to later growth competition. Different planting densities lead to poor landscape viewing effects of ground cover plants. The planting density of planted ground cover plants should be adjusted reasonably. Avoid this happening again.

5. Conclusion

Taking the ground cover plants of seven comprehensive parks in Guangzhou as the research object, a total of 79 quadrats were set up. The frequency of plants in

the quadrats was counted. The results showed that there were 99 kinds of ground cover plants in the common plant landscape of Guangzhou Park, including 41 kinds of herbaceous plants and 54 kinds of woody plants. The frequency of plant occurrence shows that the ground cover plants in Guangzhou park are mainly herbs, more woody plants and fewer ferns and vines. Herbaceous plants are mainly foliage plants, and there are few color-leaf plants; there are many colored leaf plants in woody plants. The ornamental types of plants are diverse, the collocation of plants is flexible, and the landscaping level is rich. To provide a reference for the application of ground cover plants in urban park green space landscape construction.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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