

Variety Identification and Landscape Application of *Osmanthus fragrans* in Jingzhou City

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ABSTRACT

Osmanthus fragrans had been considered one of the most popular trees in China for its economic value and cultural significance. *O. fragrans*, the most ubiquitous garden plants, which varieties had been unclear in Jingzhou city. It is an urgent task to figure out the precise varieties. Therefore, the investigation was carried out. Finally, 24 varieties were identified and landscape application had been illustrated in this paper.

Keywords: *Osmanthus fragrans*; Variety identification; Landscape application

INTRODUCTION

Osmanthus fragrans, commonly known as sweet osmanthus, is a woody, evergreen species of shrubs and small trees in the Oleaceae family. Sweet osmanthus has considerable economic value and cultural significance and is one of the top ten traditional flowers in China. Twenty-four of the thirty-five species in the *Osmanthus* genus are distributed in China, with the mostly highly representative species being *O. fragrans*. To date 189 variety of *O. fragrans* have been identified and divided into five groups: *O. fragrans* Asiaticus Group, *O. fragrans* Albus Group, *O. fragrans* Luteus Group, *O. fragrans* Aurantiacus Group and *O. fragrans* Color Group [1-6]. The Albus, Luteus and Aurantiacus Group can be characterized as an autumn group, because they bloom in September and October. In contrast, the Asiaticus Group flowers throughout the year with the exception of the hot summer months. The flower color in the Aurantiacus Group ranges from orange to orange-red, while the flower color of other three groups range from ivory to yellow. The attractive character of Color Group is color leaves.

Sweet osmanthus is widely cultivated throughout China and other countries due to its prominent fragrance, colorful flowers, and medicinal properties. In China, it also has cultural significance and is cultivated extensively both as an ornamental and commercially for its flowers which have high economic value. In Asia, sweet osmanthus are ubiquitous landscape architecture trees [7]. Traditionally, sweet osmanthus has been used as a tea, juice, wine and as a garnish on food. The medicinal value of sweet osmanthus was recognized in Chinese medicinal classics, such as the Compendium of Materia Medica.

Jingzhou city, the capital of Chu Dynasty (existed 740-223 B.C.), located at the east longitude 111°C and 14°C the North latitude 29°C and 37°C, an important highway transportation hub and a port city along the Yangtze River, the total area is 141,000 square kilometers, in which 78.7% are plain lakes, is affiliated to Hubei Province. Jingzhou is a subtropical monsoon climate area. Both sunlight energy and heat are abundant, frost-free period up to 242-263 days. Thanks to the above geographical and climatic conditions, Jingzhou has flourishing vegetation. Sweet osmanthus had been planted widespread in all kinds of landscape spaces. The aim was to find out the varieties utilized in Jingzhou city, analysis its application, and propose a few of practicable suggestion for local greening.

MATERIAL AND METHOD

Materials

This study was carried out in Three Kingdoms Park, Mingyue Park, Binjiang Park, Zhongshan Park, four typical public parks considering the park size, popularity, Vegetation coverage and the numbers of sweet osmanthus tree. Its distribution was illustrated in Figure 1a-d.

Method of variety survey

Prepare variety investigation record card according to the illustrated monograph of the sweet osmanthus varieties [1]. The major items was listed and described in Table 1 and the detailed record card was presented in supplemental material (S1).

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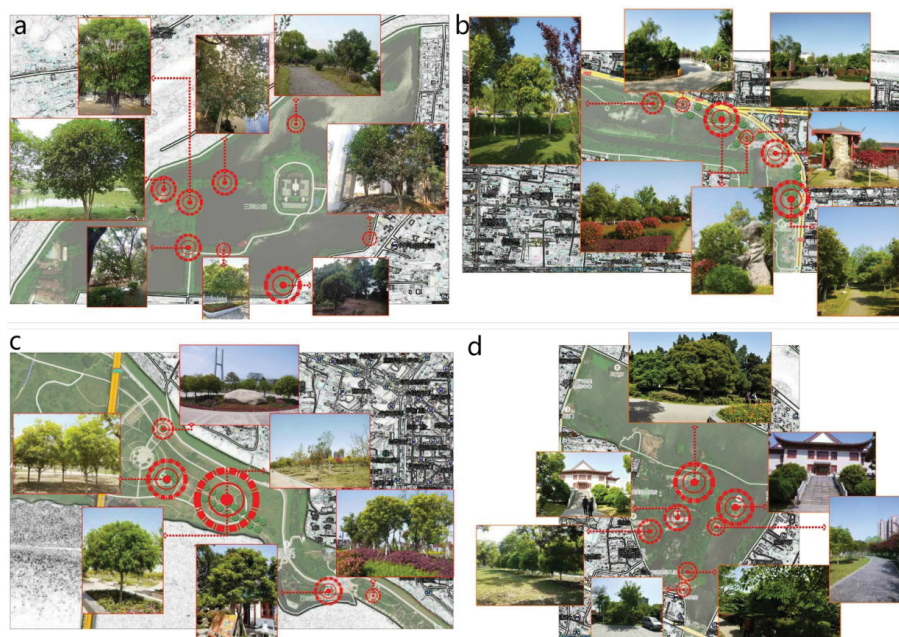


Figure 1: Main location of the investigation in Jingzhou city a indicates Three Kingdoms Park; b indicates Mingyue Park; c indicates Binjiang Park; d indicates Zhongshan Park.

Table 1: *Osmanthus fragrans* varieties in four parks of Jingzhou city.

Asiaticus Group	Albus Group	Luteus Group	Aurantiacus Group
'Sijigui'	'Dahua Zaoyingui'	'Boye Jingui'	'Chenghong Dangui'
'Daye Sijigui'	'Daye Huang'	'Liuye Jingui'	'Taoye Dangui'
'Xiaoye Sijigui'	'Daye Yingui'	'Chuizhi Huang'	'Dahua Dangui'
'Juye Sijigui'	'Duanbing Ziyingui'	'Jinqiu Gui'	'Zhusha Dangui'
'Yuegui'	'Jiangnan Liren'	'Qiugui'	'Chi Dangui'
Dongxiang Hong'	'Yinsu'	'Taoye Huang'	
	'Zigeng'		

The investigation was carried out in autumn of 2017 (from September to October) and spring of 2018 (from March to April) respectively. Both plant structure, height, diameter, crown, bark, planting mode, landscape application, planting site and surroundings, and floral bud, peduncle, diameter, shape, blossoming time and fertility of pistil and stamen during the whole blossoming stage were observed in the autumn. The next spring, detailed surveying of new shoots, fruits were carried out (S1).

RESULTS

The varieties of Jingzhou urban park were investigated and verified, which covered Four groups viz Asiaticus Group (6 var.), Albus Group (7 var.), Luteus Group (6 var.) and Aurantiacus Group (5 var.), 24 identified varieties in all except for some sample trees without necessary morphological classification information. The identified variety names were sorted in the corresponding column (Table 1). The variety diversity distribution of *O. fragrans* did present much disproportion actuality in those four parks.

Landscape application

The application form of sweet osmanthus include isolated planting, scattered planting, opposite planting, linear planting, group planting, forest planting, circular planting and architectural planting (only partial landscape utilization were illustrated, Figure 2a-f) in Jingzhou city parks.

DISCUSSION

Sweet Osmanthus are outstanding landscape trees in China

Rich fragrance and secondary metabolites, tree shape, amazing spring outlook and fall scenery, little pest and pathogen, which are the outstanding features of *O. fragrans*. Firstly, its aroma was natural and pleasant, was suitable for both city park and private courtyard even good house plant. Secondly, their seasonal characteristic are unique scenery, such as spring colored leaves, which from yellowish green to dark red regarding different varieties (Figure 3a-i). When it turns to autumn, there is various-colored-blossom all over the middle and southern provinces gardens (Figure 3b-d). From winter to late spring, fruits color is developed into purple black (Figure 3e and 3f). Thirdly, a series new variation emerging [8], which were named as *Osmanthus fragrans* Colour Group such as *O. fragrans* 'Yinbi Huanghui'(Figure 3g) and 'Qiannan Guifei' (Figure 3h), the first one, yellow and white stripes are mosaic on leaf margins. For the later, there are many discolorations from young leaves to adult leaves. The two new varieties which ornamental period lasts for half a year. In summary, sweet osmanthus have diverse ornamental traits, which are suitable for applications in landscape greening.

Sweet osmanthus varieties in Jingzhou parks

24 varieties had been identified in this project. The number of



Figure 2: Application forms of *Osmanthus fragrans* in Jingzhou city gardens. a, present isolated planting form, b, illustrates scattered planting, c and d, indicate opposite planting, e, indicates linear planting, f, illustrates group planting.

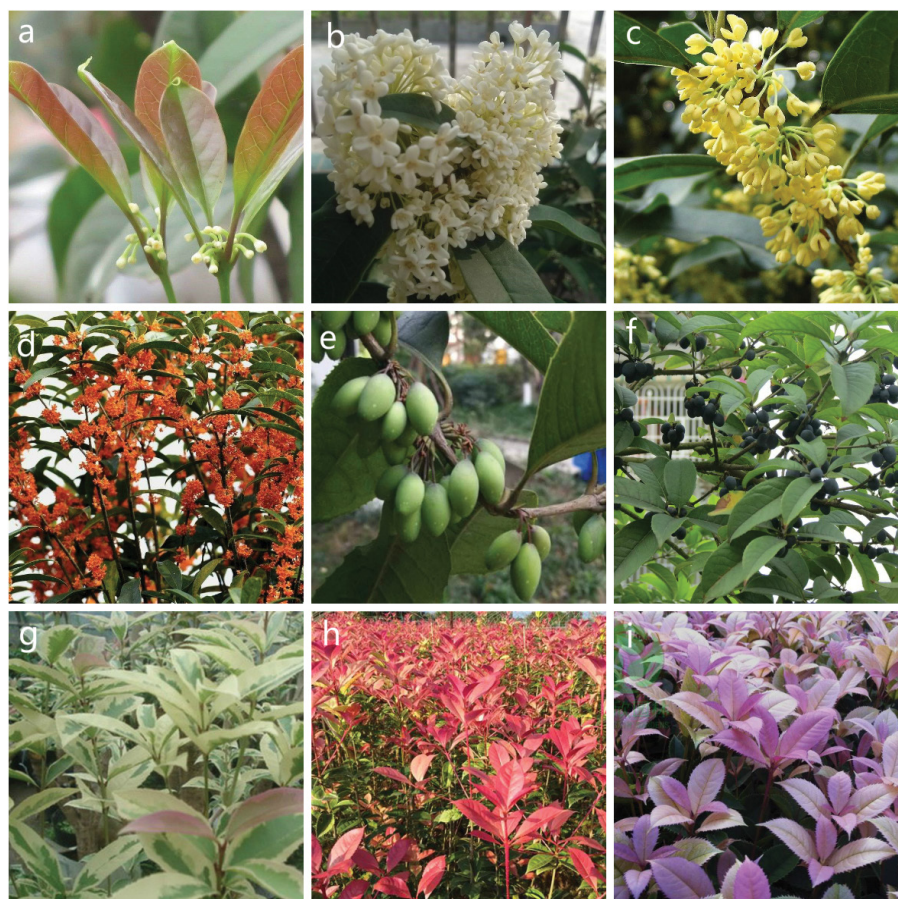


Figure 3: The outstanding ornamental characters in different seasons. a, indicates red leaves in Spring, from b to d, indicate flowers of different colors in Autumn; e and f, illustrate fruits of semi-mature and mature stages in early and later Spring; From g to i, the color group varieties were illustrated.

samples actually surveyed was much larger than the identified numbers. The possible causes are summer drought in 2017 and the consequences of transplantation. The morphological identification of sweet osmanthus mainly depend on flower characteristics, such as inflorescence type, petal color and other petal feathers, pedicel obliquely spreading or drooping, flowering time and so on. Owing to newly transplantation, the construction

of new roots was not as good as those untransplanted trees; the nutrients of the aboveground part mainly come from the soil balls carried during transplanting. Furthermore, flower bud differentiation of autumn *Osmanthus fragrans* is mainly in summer, severe drought happened and lasted for more than a month, the necessary water of flower bud differentiation was in active demand. Overall, the inherent characteristics of those

investigated *Osmanthus fragrans* samples did not have been exhibited completely, varieties identification was affected to some extent, especially for those new transplanted *O. fragrans* trees. So, 24 *O. fragrans* varieties had been identified.

CONCLUSION

Sweet osmanthus trees had been used in Chinese southern provinces for its pleasant aroma and seasonal ornamentation. 24 varieties were suitable for both isolated planting and group planting, the sweet osmanthus had been regarded as popularized trees in the south provinces of China. Considering the landscape diversity of city parks, some elite varieties, viz some with amazing ornamental leaves, and others with long flowering period, should be applied in modern parks gradually.

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