



Distribution And Taxonomy of *Paeonia*

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Abstract: Peonies are rich and bright in color, and they also have important medicinal value. This article introduces the distribution of peony around the world, the classification of the genus *Paeonia* and the classification of *Paeonia officinalis* L., further elaborates on peony from a taxonomic perspective, and provide a theoretical basis for the popularity of peony, a promising plant, around the world.

Keywords: peony, *Paeonia*, *Paeonia officinalis* L., classification, distribution

1. Introduction

Peonies have long been famous all over the world. Peonies are only distributed in the temperate regions of the northern hemisphere, they are mainly distributed in Central Asia, Eastern Asia, the Mediterranean, the western Himalayas, and the Pacific region of North America [1, p. 10-16; 2, p. 1-23]. The *Paeonia* includes about 35 species worldwide [3, p. 1].

As early as the 2nd century AD, peony was recorded as a medicinal plant in the medical classics of the Han Dynasty. There are also depictions of cultivated peonies in ancient paintings of the Song Dynasty. It can be seen that peony has been used as a medicinal plant in China for more than 2000 years and as an ornamental plant for more than 1600 years [4, p. 16-18].

There are 15 species of *Paeonia* in China, 10 of which are endemic, mainly distributed in Henan, Gansu, Shaanxi, Shanxi, Hubei, Sichuan, Yunnan, and Tibet [5, p. 291-303; 6, p. 11-22].

There are 2 wild species of peonies in Uzbekistan, respectively *P. hybrida* and *P. albiflora*. These two peonies are distributed in the high mountains surrounding Tashkent, Uzbekistan.

2. The genus of *Paeonia* classification

In 1753, Linnaeus first named the genus of *Paeonia* and officially defined *Paeonia officinalis* L. [7, p. 107].

The *Paeonia* was once belonged to Ranunculaceae. According to Worsdell's research in 1908, he moved *Paeonia* to the Paeoniaceae according to the characteristics of stamens [8, p. 651-



682]. *Paeonia* is the only genus of the family Paeoniaceae [9, p. 805-838].

According to Anderson's research in 1818, *Paeonia* can be divided into tree and herbaceous peonies [10, p. 248-283]. The genus of *Paeonia* has more than 30 species of herbaceous and tree peonies. The flowering period of tree peonies and herbaceous peonies is different. The flowering period of tree peonies is generally in early spring, while herbaceous peonies are generally in late spring and early summer. Tree peonies have woody stems and can grow nearly 2 m, while herbaceous peonies have herbaceous stems and stems are shorter [11, p. 62-77].

According to Stern's research, The genus of *Paeonia* can be divided into 3 sections, respectively, the section *Moutan* DC., section *Paeonia* and section *Onaepia* Lindley [12, p. 1-146; 13, p. 729].

Tree peony, belonging to section *Moutan* DC. of *Paeonia* (Paeoniaceae), is a perennial deciduous shrub. The section *Moutan* is native to China, including 9 wild species and 1 cultivated species [14, p. 351-368; 15, p. 1]. The section *Moutan* was divided into two subsections, respectively, subsection *Vaginatae* and subsection *Delavayanae*. The subsect. *Vaginatae* include 1 cultivated species and 5 wild species. The subsect. *Delavayanae* include 4 wild species [16, p. 1-12].

The herbaceous peony belongs to two sections, respectively, section *Onaepia* Lindley and section *Paeonia* [17, p. 1-9]. The section *Onaepia* Lindley include 2 species. The section *Paeonia* was divided into two subsections, respectively, subsection *Foliolatae* and subsection *Paeonia*. The subsect. *Foliolatae* include 17 species. The subsect. *Paeonia* include 8 wild species [18, p. 1120-1136] (Table 1).

Peony can be classified according to the flower color and flower type. The peony is rich in color, and the color is mainly white, pink, and red. Peony can be classified according to the flower type, which can be divided into single type, semi-double type and double type.

Table 1
The genus of *Paeonia* classification

Section	Subsection	Species name
<i>Moutan</i>	<i>Vaginatae</i>	1. <i>P. suffruticosa</i> 2. <i>P. jishanensis</i> 3. <i>P. qiui</i> 4. <i>P. ostii</i> 5. <i>P. rockii</i> 6. <i>P. decomposita</i>
	<i>Delavayanae</i>	1. <i>P. delavayi</i> 2. <i>P. potaninii</i> 3. <i>P. lutea</i> 4. <i>P. ludlowii</i>
<i>Onaepia</i>		1. <i>P. brownii</i> 2. <i>P. californica</i>
<i>Paeonia</i>	<i>Foliolatae</i>	1. <i>P. arietina</i> 2. <i>P. banatica</i> 3. <i>P. broteri</i>



		4. <i>P. cambessedesii</i> 5. <i>P. coriacea</i> 6. <i>P. emodi</i> 7. <i>P. japonica</i> 8. <i>P. lactiflora</i> 9. <i>P. mairei</i> 10. <i>P. mascula</i> 11. <i>P. mlokosewitschi</i> 12. <i>P. obovata</i> 13. <i>P. parnassica</i> 14. <i>P. rhodia</i> 15. <i>P. russi</i> 16. <i>P. sterniana</i> 17. <i>P. wittmanniana</i>
	<i>Paeonia</i>	1. <i>P. anomala</i> 2. <i>P. clusii</i> 3. <i>P. humilis</i> 4. <i>P. officinalis</i> 5. <i>P. peregrina</i> 6. <i>P. tenuifolia</i> 7. <i>P. veitchii</i> 8. <i>P. xinjiangensis</i>

According to references [12, p. 1-146; 13, p. 729; 14, p. 351-368; 15, p. 1; 16, p. 1-12; 17, p. 1-9; 18, p. 1120-1136; 19, p. 297-323].

3. *Paeonia officinalis* classification and morphological description

Paeonia officinalis belongs to the section *Paeonia*. *Paeonia officinalis* is native to Europe and is a protected species in France. It is mainly distributed in the low mountains and hills of southern and central Europe [20, p. 51-60; 21, p. 544-549]. *Paeonia officinalis* is an endangered plant and protected by IUCN [22, p. 195-201].

Paeonia officinalis has a thick rhizome. The height of the flower stem is about 30-70 cm, and the leaves are pinnate. The flower color is dark pink or rose. Each flower has about 5-10 petals, 80-300 stamens, 1-4 carpels, and about 20 black oval seeds in each carpel [23, p. 643-658].

Paeonia officinalis, as a beautiful garden ornamental plant, has received widespread attention in the world. Based on the APG III classification system, this article systematically explains the classification of *Paeonia officinalis* and provides a classification theoretical basis for the popularization of *Paeonia officinalis* (Table 2).

Table 2

***Paeonia officinalis* L. classification method
(According to the APG III system)**

Classification	Name
Domain	Eukaryotes
Kingdom	Plants



Subkingdom	Vascular plants
Department	Flowering plants
Class	Dicotyledonous
Subclass	Dilleniidae
Order	Saxifrageales
Family	Paeoniaceae
Genus	<i>Paeonia</i>
Species	<i>Paeonia officinalis</i> L.
Subspecies	<i>Paeonia officinalis</i> subsp. <i>microcarpa</i> , <i>Paeonia officinalis</i> subsp. <i>villosa</i> <i>Paeonia officinalis</i> subsp. <i>officinalis</i> <i>Paeonia officinalis</i> subsp. <i>banatica</i>

According to references [24, p. 85-874; 25, p. 922-932].

Paeonia officinalis is widely distributed in Central Asia and has been grown in the Botanical Garden of the National University of Uzbekistan. Because of its important ornamental and medicinal value, in the future, we will continue to conduct in-depth research based on the morphological characteristics, classification and physiological and ecological characteristics of *Paeonia officinalis*.

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