Peony Species

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Peony Species are the wild ancestors of our garden peonies.

How many peony species are there?

In 2010 Hong De-Yuan published Peonies of the World Taxonomy and Phytogeography, a scholarly, well-researched peony monograph focused on peony taxonomy and peony habitats. He followed this with the publication of Peonies of the World, Polymorphism and Diversity in 2011.

Hong lists 33 species with 15 subspecies, for a total of 48. Gardeners and horticulturists are often more interested in selected forms of species than taxonomists so that they may be surprised at the classification.

Where are peonies native to?

Wild peonies are only found in the temperate northern hemisphere, USDA Plant Hardiness Zones three to eight. The majority are found in Asia westward across to far western Europe. Two peony species are native to the North American Continent and are not known to be successful in cultivation.

There are three sections or main divisions of the species in genus Paeonia.

Section Onaepia is represented by two species native to North- ern Mexico and the Western United States. They are found on dry mountain chaparral with an extended dry period and relatively short growing season. Surprisingly their closest relatives by DNA testing are the woody peonies!

Paeonia brownii and Paeonia californica are both diploids and both are extremely difficult to grow. Paeonia brownii has a wider distribution and has one to four flowers per stem. **It** grows at 2,000-6,000 feet on rocky granite or volcanic soils from Northern California, Idaho, Nevada, Oregon, Utah, Washington and Wyoming. Its habitat is characterized by severe drought; early summer dormancy is normal in its chaparral habitat. The small dark purple/red-brown flowers may have a yellow edge to the petals and the blooms are pendant. The foliage is a glaucus blue-green in color.

Paeonia californica has a more restricted growing range and is limited to the northernmost part of Baja California, Mexico and Southern California from coastal areas into the mountains. It grows on dry granitic soils and is not known to be in cultivation.

Contributions of Section Onaepia to horticulture are none to date. Although some hybrids have been germinated, few have been raised to flowering and none are in commerce. It has a narrow adaptability and consistently fails in cultivation. Seeds germinate well, but trans- planting often results in loss of the seedlings. Conservation of its habitat is crucial to its survival.

Section Moutan is represented by woody shrubs up to 1112 feet tall and is primarily native to China, with all of them being diploids.

There are two subsections within Section Moutan: Delavayanae and Vaginatae.

Subsection Delavayanae is characterized by multiple flowers per stem and includes *Paeonia ludlowii* and *Paeonia delavayi* which includes various colored flower forms with petals from white, green, yellow, orange and dark red.

Paeonia ludlowii has all yellow flowers with three to four flowers per stem. It is a tall growing shrub up to 11 ½ feet. It reproduces by seed, not runners. **In** China it is used as a medicinal plant and is endangered due to over harvesting. It is found growing in forests and thickets from 9,565-11,488 feet elevation on granitic soils.

Paeonia delavayi is found in warmer growing regions than *P. rockii* or *P ostii* and is the southern- most growing of all peony species. In its native range there are 180-341 frost free days. Soil pH 4.9- 5.7 is considered acidic. It dies completely to the ground in Minnesota but survives and regrows from the roots and is persistent, having blooms most years. Based on its native distribution, it is no doubt better suited to a warmer climate.

Paeonia delavayi

Contributions to horticulture include the Lutea Hybrid tree peonies and also its yellow coloration to the Itoh group of cultivated peonies. *Paeony ludlowii* has not been a contributor to our hybrid peonies.

Subsection Vaginatae is characterized by a single flower per stem and there are seven species and two subspecies in this subsection.

Paeonia decomposita is found only in the Dadu River Valley. The closely related species *Paeonia rotundilobia* is found only in Minjiang River Valley in Northwest Sichuan, China. Over collection of both of these species for use as medicine and habitat destruction threaten them both. Reproduction is by seed only. They occur in open forests and thickets from 5,650-10,300 feet elevation. The flower color is rose-pink.

***Paeonia rockii* grown from seed collected in the wild in China**

Paeonia rockii has two subspecies with both being quite cold tolerant. They are found growing in partial shade. It grows in sparse shrub lands. This species crosses easily with other cultivated forms, especially *Paeonia ostii. Paeonia rockii* has a long growing season in its native habitat of 245-300 frost

free days. Plant height is about three to six feet tall and the flower color varies from pure white with a dark purple basal blotch to a rosy red colored petal.

Paeonia ostii is vigorous growing to about four feet tall and is noted for being cold and drought tolerant. It is often cultivated as a medicinal plant for its root bark. Easy to grow from seed, it typically blooms in three years from germination. It is easily fertile when crossed with other woody peony spe- cies. It has sparse foliage at the base of the plant but is very floriferous and of- ten has brilliant pink fall foliage color. The flower color is white through a very pale blush lavender, with no basal spots on the petals.

Paeonia ostiii

Paeonia jishanensis grows up to six feet tall with underground stems that may produce a spreading plant capable of vegetative reproduction, with very little seed production. It grows in well-developed thickets and secondary deciduous woods at elevations of 3,000 to 5,650 feet. The flowers are white to pinkish blush.

Paeonia qiui grows to four feet tall in deciduous forests and rarely on grassy slopes or limestone rocks or cliffs at an altitude of 3,330- 7,326 feet. It has pink to pale pink flowers with a faint red blotch at the base of the petals. It has been recorded as reproducing by under- ground stems and seeds. This peony is on the verge of extinction!

Paeonia cathayana grows to only 32-inches tall with a rose colored bloom. This species is believed to be one of the major contributors as parent of most of our modern day tree peonies. It is native to West- ern Henan and Western Hubei.

Contributions of the Section Moutan to horticulture include a very large number of "tree" peonies in cultivation and their history covers centuries in their native country of China and then Japan. It is the national flower of China and is used as a medicinal and ornamental plant yet today. Propagation is primarily through grafting the woody stems onto herbaceous garden peonies as nurse roots to increase specific cultivars. The woody peonies are noted for being the most shade tolerant of this genus.

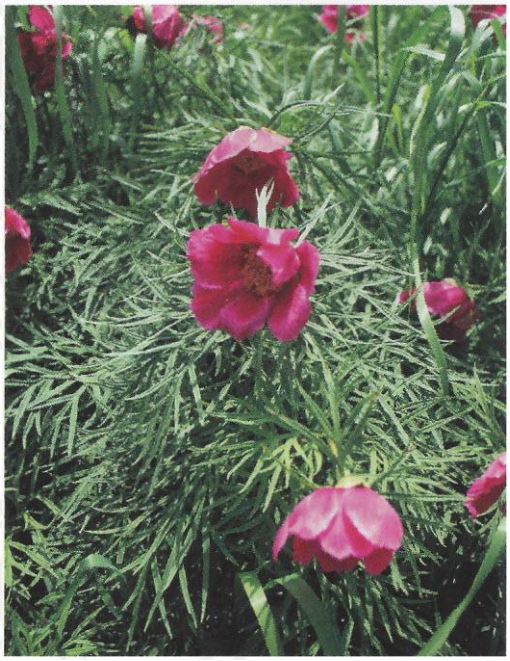
Section Paeonia Subsection Albiflorae is characterized by roots that are carrot-like in shape and tapered from the crown. There are usually several flowers per stem and all are diploids, except one population of tetraploid *P. emodi* in Tibet. Their distribution is Asia through northeastern Europe. *Paeonia lactiflora* is the most well-known and ancestor of thousands of cultivated forms of peony. It grows in grass steppes to open wood- land glades. It has multiple buds per stem and fragrant flowers and is very cold tolerant (-40^0 F). *P. lactiflora* has been cultivated for centuries in China. It is the

progenitor of over 7,000 peony cultivars. Its growing range in the wild covers China, Korea, Eastern Mongolia, Far East Russia and Southeastern Siberia. In nature *P. lactiflora* flower color varies from white to a deep rose red.

With such a wide distribution *P.lactiflora* habitats include, grasslands, open woods of oak, poplar, black birch and elm. Also found growing in *Prunus siberica* (Siberian apricots) thickets, bushy meadows with winter hazel, spirea and lezpedeza, dry meadows and sunny, stony slopes with exposed granites, dry pastures, high banks and cliffs.

Paeonia emodi grows in the Himalayan Mountains among bushes on dry and rocky slopes from 5,350-10,650 feet. Both diploid and tetraploid forms are found in nature in Tibet, China, Northwest India, Western Nepal, Northern Pakistan and Eastern Afghanistan. It has carrot-shaped roots and more than one white flower per stem. Paeonia emodi has a few hybrids, such as 'Early Windflower' and 'Late Windflower'.

Paeonia sterniana is close- ly related to P emodi and P lactiflora via genetic fingerprinting and is a diploid species. Found growing in subalpine oak forests, or thickets from 9,450-11,667 feet to the east of where P emodi grows separated by high mountain ranges of the Himalayas.



Paeonia anomala subsp. anomala

Paeonia anomala subsp. anomala grows northwest of the Gobi Desert from Northeastern and Northwestern Kazakhstan and Central Mongolia, Northeastern China Altai, Lake Baikal and Siberian Altai to the Kola Peninsula. It grows in deciduous or coniferous forests in valleys and is rare in cultivation, often confused with P. intermedia and 'Smouthi'. The flowers vary in color from lavender pink to rose red. The carrot-like roots are difficult to divide for propagation. It is a diploid species. This species prefers relatively wet sites, but is also found in well-drained situations by streams on limestone or granite, often very rocky. Most commonly associated trees are birch, larch, poplar and fir. It may be situated on stony slopes with moss and lingonberries in forest openings of larch. *Paeonia anomala* subsp. *veitchii* is separated from subspecies *anomala* by the Gobi Desert. Typically it has more than one, lavender pink to white flower per stem. It is a dwarf growing woodland peony from China.

Paeonia anomala subsp. veitchii

Carrot-shaped roots are difficult to divide so they are seed grown, requiring five years to bloom. You should have at least two different clones, not divisions of the same plant for cross pollination and more seed.

Partial shade, relatively moist soil suits it well. *P. anomala* grows in moist well-drained subalpine areas in shrubs at 6,000-12,900 feet above sea level on both limestone and sandstone soils. Found growing in grassy forest edges and slopes of stony pastures, adjacent to rivers.

Section Paeonia Subsection Foliolate is characterized by roots that are carrot-like and one flower per stem. There are 11 species and four subspecies in this subsection.

Paeonia obovata has a wide distribution from Northeastern, East- ern and Central China, Japan, Korea and the Far East of Russia. It is found growing in deciduous broad-leaved or mixed coniferous forests. It does poorly in hot sunny locations in the garden and of- ten fails to live in such conditions. *P. obovata* habitat includes larch forests, also birch, oak, poplar, pine and ash sparse, dry woodlands. Soils include shale, granite, sandstone and basalt in rocky clearings of dense forests. In the garden, growing buds should be at ground level with a layer of leaf mulch for protection. Flower color varies from white through red. *P. obovata* subsp. *willmottiae* is a tetraploid form of the species. Although the white form is more commonly found in cultivation, it too has flowers that vary from white to red.

Paeonia cambessedesii is one of the most endangered peony species. It is found only on three of the Balearic Islands, off the coast of Spain. It grows on calcareous soils with shrubs and grasses. The total population is estimated at a few hundred individual plants. Feral goats are destroying its habitat which is eroded limestone-type soils. Fortunately it produces a good crop of seed where it does grow well-it is worth seeking out seed to try in your area. No known hybrids exist in commerce. The foliage is a dark glossy green with ruby red undersides. The flowers are pink.

Paeonia corsica is found in oak and pine forests, shrub lands and rocky limestone meadows in granite and metamorphic soils, often with bracken fern. Its habitat is an open maquis, defined as scrubland with leathery evergreen broadleaf small trees like *Quercus cocciftra* and *Crataegus* species. The flower color is pink.

Paeonia broteri has a growing habitat in scrub oak and pine forests on limestone as well as Scotch pine woods and hawthorn thickets. It can also be found in clearings of fir. The pink flowers appear above glossy green leaves.

Paeonia clusii and subspecies *clusii rhodia* are found in dry scrubland in limestone soils, open pine woods on limestone soils. Found only on the islands of Crete and Karpathos for *P. clusii* and the island of Rhodes for the subspecies *rhodia.* The flower color is white. It is not in cultivation and no known hybrids are in commerce.

Paeonia daurica

Paeonia daurica has seven subspecies; some are diploids and some are tetraploid in their chromosome counts.

P. daurica daurica is a diploid species from the Crimean Peninsula and is found in open woodlands and edges of beech, hornbeam, Austrian pine, juniper and oak scrubs. It inhabits forest glades and is successfully grown in the garden. No known hybrids are in commerce. The flower color is lavender-pink.

Paeonia daurica subspecies mlokosewitchii

P. daurica subsp. *corifolia* was called *P. caucasica* and is a diploid species found growing on gentle northwestern slopes on deeper sandstone soils, also limestone and volcanic rocks in forest clearings, meadows and scrub. It is vigorous in the garden, hardy and sets much seed. It also hybridizes readily with the yellow species *P. d. mlokosewitschii. Paeonia daurica* subsp. *coriifolia* grows 2,100 feet above sea level. The flower color is rosy red.

P. daurica subsp. *mlokosewitschii* is found growing at higher elevations than *P. daurica corifolia (caucasica)* at 3,467 feet and at lower elevations than *P. daurica macrophylla.* It grows on the southern slopes of deciduous forests, where snow melt feeds moisture below ground in rocky well-drained soils. In its native valley it can be found in several colors, including yellow, pink and pink-edged cream.

P. daurica subsp. *macrophylla* isfound growing in high mountains in Southwestern Georgia at an elevation of 4,000-7,667 feet in subalpine areas of deciduous and mixed coniferous woodland glades. It grows on volcanic and granitic soils in Armenia, Northeastern Turkey and Southeastern Georgia. It has large leaves and a creamy white flower.

Paeonia daurica wittmanniana

P. daurica tomentosa grows in deciduous forests and occasionally open pastures in sandy soils in the Talish Mountains of Azerbaijan and the Elburz Mountains in North- ern Iran at the southern end of the Caspian Sea. The flower color is pale yellow.

P. daurica wittmanniana grows in deciduous beech forests and alpine and subalpine pastures and meadows at 5,000-7,660 feet elevation. It is only found growing on limestone soils! Rarely found in cultiva- tion. Flowers are a pale creamy yellow.

Paeonia daurica subsp. *velebitensis* is just recently described from the Velebit Mountains in Croatia at elevations of2,950-3,770 feet. Photos of this species show a light-colored flower with pink basal markings, though details are not precise at this time.

Paeonia mascula has a wide distribution and has been used medicinally for centuries, so native

populations were exhausted by the 16th century but survived in monastic and herbal gardens with a widely scattered population that extends through Italy, Sicily, Greece and Asia Minor. It has carrot-like roots and there are four subspecies recognized: *P. mascula mascula, P. mascula hellenica, P. mascula russoi* and *P. mascula bodurii.* Only *P. mascula mascula* is typically found in cultivation and has pink-lavender blooms. *P. mascula bodurii* from Turkey has white flowers and subspecies hellenica has flowers that are mostly white to pink.

Paeonia mairei grows in the woodlands of China at high elevations and does best with part shade and a woodland type soil. The crown of the plant should be covered with leaf mulch. It has one pink flower per stem and blooms very early. Hong De-Yuan *(Peonies of the World Taxonomy and Phytogeography* and *Peonies of the World, Polymorphism and Diversity)* reports only tetraploids in nature, not diploids as originally reported. This species appears to be quite hardy, growing in Wisconsin and Minnesota as well as the Pacific Northwest.

Paeonia kesrouanensis has blooms that vary from pale pink through red and grows in Lebanon, Southwestern Syria and Southwestern and Southern Turkey. It grows to about three feet tall and is a tetraploid species. *Paeonia coriacea* is native to Southern Spain and Morocco and its blooms are red. *Paeonia algeriensis* is found in a very small area of coastal mountains bordering Kabylie (Algeria) and Northern Africa. *Paeonia algeriensis* grows in broadleaf or mixed broadleaf and coniferous woods in calcareous soils from 3,600-6,660 feet elevation and the flowers vary from pink to red. The above three species are little known or not in cultivation.

Paeonia subsection Paeonia are all characterized by fusiform tuberous roots.

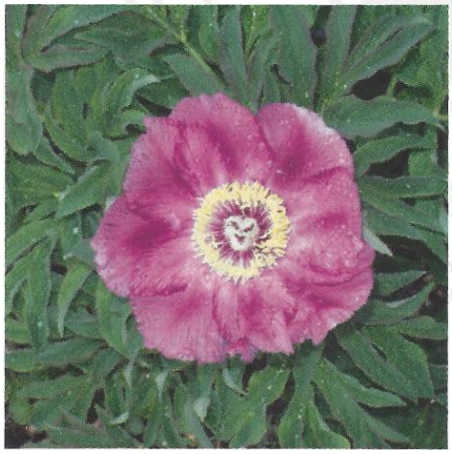
Paeonia intermedia grows on grassy slopes with few shrubs, meadows, steppes or sparse woodlands. It grows in Northern Xinjiang of China, south to the Tian Shan Mountains, to Kazakhstan, Kirghizia, Tajikistan, Uzbekistan and the Russian Altai. **It** grows at elevations from 3,000-10,834 feet and is a diploid species. *Paeonia intermedia* is listed as endangered. The flower color is purple-red. *Paeonia tenufolia* the fern-leaf peony has been in cultivation for many years in the double and single-flowered forms. Listed as endangered in Transylvania and offered strict protection in Romania, it is found growing on some fragile dry steppe environments, where

Paeonia tenufolia cartalinica

they have survived because of local protection. This species varies in height across its geographic range from seven- to 22-inches, so the size of the plant varies genetically from different locations. It grows at elevations of less than 3,000 feet on south sloping meadows, sandstone with sparse bushes and grasses and sand dunes. On steppe-type habitat it goes dormant in the early summer, when the rains stop. There are several color forms including red, white and pink and a double red flower form. The white form is not known to be in cultivation at this time.
P. tenuifolia has been used to create several hybrids in commerce and passes along its early bloom habit. Its narrow foliage is modified by the other parent and is fine although wider than the species, as in 'Early Bird '.

P. peregrina is a brilliant red- flowered species from Albania, Southern Italy, Moldova, Greece, Turkey, Romania, Serbia, Macedonia and Bulgaria. It grows in deciduous and coniferous mixed woods on calcareous (limestone) well- drained soils. It is quite hardy for a species from a Mediterranean climate and grows at elevations of 166-5,000 feet. It is a tetraploid species, with a rare occurrence of a diploid population in Macedonia. P. peregrina is most likely the parent of a huge host of hybrids registered as having lobata as its parent. It may also have been erroneously listed as P. officinalis in new cultivar registrations for some of the dark red hybrids that are so popular. Some speculate that P. off. 'Rubra Plena' and its sports are actually peregrina hybrids, because of the similarities in plant and foliage habit.

***Paeonia peregrina* from Romania; wild collected seed.**



Paeonia officinalis subspecies mtcrocarpa

Paeonia saueri is a newly described peony from Northeastern Greece and Southern Albania. It is a tetraploid with tuberous roots and bril- liant red flowers. Found growing in deciduous forests near the edges or in forest clearings near mountain summits at 1,535-4,067 feet elevation. Not known to be in cultivation in the United States or verified as a parent used in hybridizing.

Paeonia parnassica is found growing only in Greece on Mt. Parnassos and Mt. Elikonas at 3,367- 5,000 feet. It is listed as endangered with fewer than 2,500 individual plants in the wild. It grows on edges of Abies forests, on the limestone rocks of south facing slopes in damp grassy meadows. Purple-red flowers, rarely found in cultivation, it has been used as a parent although its hybrids are not currently in commerce. It is a tetraploid.

Paeonia arietina is widely distributed in nature from Turkey, Romania, Bosnia-Herzegovina, Albania, Croatia and Northeastern Italy. It is a tetraploid species with tuberous roots and grows in sparse oak or coniferous woods, forest clearings and pastures on limestone or granitic soils at elevations from 1,000-7,000 feet. The flower color varies from rose to red and rarely white.

Many *P. officinalis* subspecies are native to mountain habitats there being five subspecies with minor differences in growth habit.
P. officinalis subsp. *officinalis* grows at 1,667-6,667 feet. *P. officinalis* subsp. *italica* at 2,167-6,000 feet. *Paeonia officinalis* ssp. *huthii (villosa)* grows at 3,000-6,567 feet. *P. officinalis* subsp. *microcarpa* can be found growing on steep mountain sides in El Ports, Spain. *P. officinalis* subs. *banatica* is found in open woodlands in Hungary and adjacent countries in the Banat Region.

Paeonia officinalis 'rubra plena'

There are several horticultural forms of *P. officinalis* that are found in cultivation *P. officinalis anemoneflora, P. officinalis rosea plena* and *P. officinalis* 'Rubra Plena'.

There are seven species and four subspecies with tuberous roots and a single flower per stem. Some of these peonies will propagate by adventitious, vegetative buds on broken root pieces. This characteristic is expressed on well-drained sandy soils more often than on heavy clay soils.

Paeonia officinalis 'rosea plena'

FINAL NOTES ON SECTION PAEONIA SUBSECTION PAEONIA

The tetraploid species of this subsection show a wider variation in plant characters than the two diploid species, making it difficult to distinguish them from one another. And, their ability to easily interbreed in the garden, allows for hybrids with intermediate plant forms between these species.