MiA - Museums in Akershus **European peonies in** Norwegian clone archives – a morphological study

Mari Marstein, curator NMF

Museums in Akershus mia.no



Text and photos: Mari Marstein, curator NMF, MiA - Museums in Akershus

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Background

The Finnish Gene Resources Centre Luke initiated in 2018 an investigation of European and West-Asian peonies in Nordic clone archives. The investigation covered morphological studies and DNA-studies of *Paeonia anomala*, *Paeonia* x hybrida, *Paeonia humilis flore pleno*, *Paeonia* tenuifolia and *Paeonia* x festiva.

I received support from the Norwegian Directorate of Agriculture to make a morphological study of these peonies in Norwegian clone archives. Samples were sent to Finland for DNA-studies. These results are not present as this article is published. All plants are collected in gardens. *Paeonia humilis flore pleno* has now got the formal name *Paeonia* 'Nordic Paradox', and this name will be used in this study.

The original aim with my part of the investigation was:

- To find out which of these peonies grew in Norwegian clone archives.
- To make a checklist of characters for each taxon.

It proved to be harder than originally supposed to identify the peonies, especially in the *P*. x *hybrida-* and *P. tenuifolia-*group. After working through the collected material I added a third point:

 To find useful names for the collected plants.

After the initial chapters I will describe a selection of collected plants. These will be compared to descriptions of the species, and similarities and differences will be discussed, before conclusion of what name I will recommend for each one of them.

Illustration

Peonies at Gamle Hvam museum. At rear the pink Paeonia anaomala. In front from left: Paeonia x festiva 'Rubra Plena', Paeonia 'Nordic Paradox' and Paeonia x festiva 'Rosea Plena'.



Problems in identifying peonies

Terms

The taxonomy of the genus *Paeonia* is confusing. Several species hybridize and new forms arise, without any knowledge of what parents are involved. Further there are many intermediate forms, even within the species. (Passalacqua & Bernardo 2004:216, Cullen et al. 2011:445). Peonies seem to be influenced by the conditions under which they grow, the so called *phenology*. Temperature, amount of daylight, humidity and latitude influence the plants to a degree that one might think they are different species. Further, it is a problem that two different plants can have the same description, without being identical.

To identify peonies, many characters have to be compared. This survey is about plants growing in culture, and for them there are not as comprehensive descriptions as for plants growing in the wild.

The identification is based on literature that in my opinion is reliable and thorough. Hong De-Yuan's two books: *Peonies of the world: Taxonomy and phytogeography* (2010) and *Peonies of the world: Polymorphism and diversity* (2011) is based on extensive field observations around the world, in all regions where peonies grow naturally. Hong gives detailed descriptions that can be compared to my own morphological observations.

I use two older monographs concerning peonies grown in culture: *A monograph of the genus Paeonia* (Anderson 1819) and *A study of the genus Paeonia* (Stern 1946). *The European Garden flora* (Cullen et al. 2011) gives good descriptions as well. These give a survey of the peony systematics for the last 200 years, but since this is a difficult genus, the different authors do not always agree. By *Europaean peonies* I mean species and crossings where these are included, with natural habitats in Europe and in the western parts of Asia.

A *clone* is a plant that is separated from the original plant by root parts. The old and the new plants are identical, sharing the same characteristics.

A *clone archive* is a collection of clones growing in soil and tended, such as in a garden.

Some crossings have a unique *cultivar name*, written in simple quotes, like *Paeonia* x *festiva* 'Rubra Plena' or *Paeonia* 'Nordic Paradox'.

Morphology is the science of form, size and structure. By comparing the plants forms to each other and to published descriptions, we might trace the botanical relationships.

Phenology is about how the climate influence a plant's growth, size, colour and periodical cycle. This survey includes plants from south to north in Norway, and from coast to inland, and it is interesting to observe the differences between the regions.

Taxonomy is classification of plants into the correct group, either family, genus or species.

Sources

Method

The most important sources are the plants themselves, with information of where they are collected and their history. The study of living plants is essential for species determination. Photos and written descriptions are not enough. The senses perceive details that cannot be conveyed in text.

Still written sources are necessary. Nursery catalogues from 1900–1950 tells us which nurseries sold the different species or cultivars. However, the name in the plant list may not always be the correct name of the plant. I will return to this under the discussion of *Paeonia* x *hybrida*.

Facebook should not be neglected as a useful source. In many groups there is considerable experience and knowledge, and discussions in groups like "The Swedish Peony Society" have been useful. However, one must utilize considerable source criticism. The investigated plants grow in four Norwegian clone archives:

- Agder nature museum and botanical garden in Kristiansand, Agder
- Gamle Hvam museum's plant collection in Nes, Akershus
- Gamlehagen at Ringve botanical garden in Trondheim, Trøndelag
- Tradisjonshagen at Tromsø arctic-alpine botanical garden, Troms.

The method included the following actions:

- to photograph the plant growing in the collection
- to give a morphological description of a selection of the plants
- to press plants for further investigations
- to send samples to Finland for DNA-studies
- to compare the collected plants to descriptions of the true species
- to compare the collected plants to each other

Mostly one or two stems were collected from each plant. In case of several specimens of the same species or cultivar, the best established and strongest was chosen. Weak plants were omitted.

	Agder	Gamle Hvam	Ringve	Tromsø
Officinalis group		GH 2006 23 GH 2014 06		2004 207 2010 153 1 2010 153 2
Rubra/Rosea Plena group	2001 1028 2003 0248 2006 0135	GH 2007 17 GH 2008 05 GH 2008 09	2004 501 2008 224	2010 70
Anomala/intermedia/ tenuifolia group		GH 2009 09 GH 2009 10	1978 448 2004 488	2004 120
'Nordic Paradox'		GH 1980 01	2005 254	

The following plants are described, photographed and pressed for herbarium specimens:

Characters and descriptors

The following describes how terms for characters are used in this article. The explanations are based on Hong (2010), Halda (2004), Judd et al. (1995) and Wikipedia.

Roots are always thickened. Either tapering towards one end like a carrot or tapering towards both ends like a spindle (Hong 2010:29). Within our group of peonies, the only species with carrot-shaped roots is *Paeonia anomala* illlustration in Hong 2010:128). All the other species relevant to this study have spindleshaped roots, which are more or less thickened. The roots I have dug up show great variation, and sometimes it is difficult to separate carrotshaped from spindle-shaped roots. I will only mention the roots in a few cases.

Leaflets: All leaves are compound. Instead of using the terms *biternate* and *triternate*, I count leaf segments. It is a simpler and equally reliable method for identification. If a segment is only a few mm long, it is left out and not counted.

According to Hong (2010:33f) the number of leaf segments in the lower leaves are valuable characters in determining species, as well as the leaflet width. Mostly I have pressed the lowermost, the middle and the top leaves of the stem.

Leaf upper surface is mostly glabrous, without hairs. Some species have short, stiff hairs; bristles, along the veins on the upper surface.

Illustrations (from top):

Roots of *Paeonia* 'Nordic Paradox' from Gamle Hvam, Akershus. It is difficult to tell spindle-shaped from carrot-shaped roots.

The lower leaf of GH 2009 09 *Paeonia* x *hybrida* Sørumsand, Akershus. Ca. 135 segments.

Bristles along veins at Ringve 2004-501 *Paeonia* x *festiva* 'Rosea Plena'.







In some species the leaf upper surface looks as if it is covered in a thin wax coat. The term for this is *glaucous*. Raindrops will form pearls on this surface.

Hair covering: Sepals, carpels and the lower leaf surface sometimes have more or less hair covering; *indumentum*. The different forms have different terms, but since I have not found unambiguously definitions and illustrations of these terms, I will describe them in my own words where necessary.

The flower is single or double. Single flowers in this study have 12 petals or less, and they always have stamens and carpels. Double flowers in this study have up to 300 petals, and they never have stamens, since in the double flower the stamens are transformed into petal-like structures.

Disk: The flower rests on a structure called *disk* or *disc*. It is like a plate, with a raised structure surrounding the carpels. The disk vary in height with ca. 3 mm as a maximum. The structure surrounding the carpels is more or less prominent, and the colour is white or reddish. This might be a determining character, but further comparison is needed.

Illustrations (from top): Glaucous surface with raindrop on GH 1980 01 *Paeonia* 'Nordic Paradox'.

Sepals with hispidulous hair covering, Agder 2006-0135 *Paeonia* x *festiva* 'Rubra Plena'. *Hispidulous* describes short, stiff hairs, like a two days old beard.

The disk in GH 2009 10 *Paeonia anomala* from Ringerike is rather flat, and the raised edge is white and not very prominent. The disk in GH 2014 06 *Paeonia officinalis* Nes Hedmark is thick and wavy, and the raised edge is red and prominent.









Bracts and sepals: According to Hong, the shape of bracts and sepals is a good defining character (2010:39ff). He defines a sepal as an element whose lower part is wider than the upper part, otherwise he defines it as a bract. He includes drawings of bracts-sepals series in his descriptions of all the species. I have made drawings for most of the plants I discuss.

Illustration

Bracts and sepals in Gamle Hvam 2008 05 *Paeonia officinalis* fra Gjerdrum, Akershus.

Analysis and discussion of the collected specimens

Paeonia anomala

This might be the only true species in the whole study. It is collected from a farm in Ask, Ringerike, where it was well established in the 1950s. The stems are upright and the plant needs no support during flowering time in the end of May. It fits Hong's description of *Paeonia anomala* with one exception: According to Hong, the leaves should have 70-100 segments.

In the pressed leaves of this plant there are 40 and 60 segments. The leaflets size, however, matches Hong's description, with a width of 0,8-3,2 cm. Study with lens suggests there are tiny bristles along veins, a character emphasized by Hong (2010:125). The foliage is lush, with 8-10 leaves on each stem, which is a rather high number compared to the other plants in this study. The flower is like an open bowl, with petals bending slightly outwards when the flower is mature. The colour is dark pink when it opens, but as the petals are thin, the colour looks paler when the light comes through. Flower diameter is 10-12 cm, and flower height is 5 cm. It is nodding outwards. Hong does not mention the flower diameter, but he states the number of petals to 6-9. Our plant has 7-8 petals. The filaments are white, and the stigmas are the same colour as the petals.

Illustration

Herbarium sheet for GH 2009 10 *Paeonia anomala* from Ask, Ringerike.



Flower, GH 2009 10 Paeonia anomala from Ask, Ringerike.

Flower, GH 2009 10 Paeonia anomala from Ask, Ringerike, from side.





The carpels are shiny and glabrous, usually five, sometimes four in each flower. They are upright during flowering, but fold flat outwards when ripe. According to Hong they are mostly hairy, rarely glabrous (2010:125), but both Anderson (1818:261) and Stern (1946:112) describes the carpels as glabrous in this species. Stern separates a variety with hairy (tomentose) carpels as *Paeonia anomala* var. *intermedia*. Hong (2010:205) does not accept this name as a valid taxon.

The sepals are caudate, which means they have a pointed tale on top. They are hispidulous only on the adaxial surface, near the top. This is an unusual character in our collection of peonies. The involucrate bracts are long and elegant, as in the drawing in Hong's book (2010:128). All characters, except the number of leaf segments, correspond with Hong's description of Paeonia anomala subspecies anomala. I have not found the subspecies vetchii among the Norwegian peonies collected from gardens.

Photo of the plant in Hong (2011:40) gives the same general impression as Gamle Hvam's plant, with the lush, but airy foliage and the nodding flowers. Gamle Hvam's plant corresponds as a whole with Hong's description of *Paeonia anomala*. The deviation in segments and indumentum lies within the accepted variation.

I call Gamle Hvam's plant, GH 2009 10 from Ask, Ringerike by the species name *Paeonia anomala*. I have not yet found it in many gardens in Norway, but a very similar plant was observed in a garden in Bismo, Skjåk, Oppland (Marstein and Vange 2009:10). The garden owner received it from a neighbour when they lived in Valdres, Oppland, in the 1980s. They brought the plant with them to Bismo when they moved here. *Paeonia anomala*'s natural habitat stretches through Siberia to the eastern end of the Kola peninsula, so this plant should easily grow well in most of Norway, Sweden and Finland. I suggest the Norwegian name *sibirpion* for this plant, as it corresponds with the Swedish name.

Illustrations (from top):

Carpels, GH 2009 10 *Paeonia anomala* from Ask, Ringerike.

GH 2009 10 in a private garden.





Paeonia x smouthii

This plant is supposed to be a crossing between *Paeonia tenuifolia* and *Paeonia lactiflora*. It is difficult to find a good description of it, but in the European Garden Flora (Cullen et al. 2011:450) it is described as follows:

Stem hairless, 50-55 cm. Leaves 5-7. Lower leaves twice divided into 3, the divisions deeply cut into 15-18 very narrowly elliptic acute segments, 3-10 mm wide, hairless except for minute bristles along veins above. Flowers 1 or 2, bowl-shaped, 6-8 cm across, petals red, ca. 5 cm. Filaments yellow. Carpels 2-4, mostly 3, dark purple, hairless or slightly hairy.

Ringve botanical garden keeps a plant that fits this description. Ringve 2004-488 is collected from Hylla, Inderøy, with a history that goes back to before 1960, when a young woman married into to the farm. The plant grew in the garden was from her mother-in-law. This plant was originally recorded at Ringve as *P. anomala* or *P. x hybrida*, but gardener Stefan Patrick Nilsen suggested it might be *P. x smouthii*. I agree with him. The sweet scent reveals the relationship to *Paeonia lactiflora*. The website Dave's Garden, which I consider as a serious source, shows pictures that fits the plant at Ringve¹¹. Louis van Houtte (1810–1876) is referred to as the breeder, with 1845 as the year of introduction. He plant originated probably from van Houtte's nursery in Gentbrugge, which he owned together with Adolf Papeleu.

The sweet scent, the deep purple carpels and the bowl-shaped flowers makes this plant easy to identify. So far I have no suggestion for a Norwegian name for this cultivar. *Paeonia x hybrida* or *Paeonia tenuifolia*?

1https://davesgarden.com/guides/pf/go/90366/

Illustration

Herbarium specimen of *Paeonia* x *smouthii*, Ringve 2004-488, from Hylla, Inderøy i Trøndelag.



Ringve 2004-488 *Paeonia* x *smouthii* flowering in Ringve botanical garden, Trondheim.

Dark purple carpels and yellow filaments. Ringve 2004-488 Paeonia x smouthii, from Hylla, Inderøy, Trøndelag.





Illustration

Bowl-shaped flower, 6-8 cm diameter. Ringve 2004-488 Paeonia x smouthii, from Hylla, Inderøy, Trøndelag.



Paeonia x hybrida or Paeonia tenuifolia?

In Finnish, Swedish, and Norwegian gardens grows a plant called *Paeonia x hybrida*, with the Swedish name herrgårdspion (manor house peony). This is supposed to be a distinctive horticultural form and an old hybrid in the Nordic countries².

According to Hong, *Paeonia x hybrida* is not a valid taxon. He includes all similar plants with leaflets up to 8 mm wide into the taxon *Paeonia tenuifola*, since he has observed such variation in natural populations.

The European Garden Flora (Cullen et al. 2011:450) describes *Paeonia* x *hybrida* (Pallas) like this:

Stem to 60 cm. Flowers 9-10 cm across; petals deep red. Filaments reddish. Carpels 2-4, densely felted hairy. H3. Late spring to early summer.

This hybrid first arose before 1788 in the St Petersburg Botanic Garden and before 1935 in the Hortus Bergianus, Stockholm, in both gardens when *P. tenuifolia* and *P. anomala* were growing together, and it has also been made by deliberate crossing in USA. It is almost indistinguishable from wild *P. anomala var. intermedia* except for defective pollen and the innermost sepal rounded and not mucronate.

Stern (1946:111) says this about Paeonia x hybrida:

P. hybrida of Pallas is said by A. P. de Candolle (1818) to be a garden hybrid between *P. anomala* and *P. tenuifolia*, but he adds that it "appears spontaneously in Tauria" and again that "*P. laciniata* is like *P. tenuifolia* but taller and the segments are broader – a mere variety."

Knowing that *P. x smouthii* has been called *P. laciniata* by some authors, this illustrates the confusion concerning these similar looking plants. The written descriptions coincide, but the plants look different. Hopefully the DNA-study can bring some answers concerning the complex including *Paeonia x hybrida*, *Paeonia x smouthii*, *Paeonia anomala* and *Paeonia tenuifolia*.

Oskarsson (2008:103) describes *P. x hybrida* as 90-100 cm tall, early-flowering, with one flower to each stem. The plants rarely get ripe seeds, as only a small part of the pollen is fertile.

Illustration *P. x hybrida* GH 2009-09 Sørumsand.



² E-mail from Martin Hajman 07.02.2019.

Three of the peonies in this survey are close to the description of *P. x hybrida.* GH 2009 09 from Sørumsand, Akershus has a history back to before 1960, when it grew in the garden of a small cabin just outside Oslo. In the first half of the 20th century, people from Oslo who could afford it, built these cabins, surrounded by a small garden, just outside the city border. As they were close to a train station or bus stop, they could easily be reached by public transport. In this way people living in the city centre could get into the countryside during weekends and holidays.

Ringve 1978-448 comes from Svinvik's arboretum in Møre, where Halvor and Anne Svinvik in the 1940s established their exotic garden, with rhododendrons, bamboos and other tender plants from around the world.

Tromsø 2004-120 comes from a garden in Hamarøy, Nordland, where it was collected by botanist Brynhild Mørkved in 2004. Her notes on collecting tells us it probably dates back to 1930. Unfortunately, it no longer grows in this garden and the specimen in Tromsø is weak.

These three plants are all very close to Hong's descriptions of the wild *P. tenuifolia*, except the flower is larger, the number of leaf segments are smaller and the leaf segments are longer.

Hong includes leaflets with width up to 8 mm in the species *P. tenuifolia* (Hong 2010:210). Stern only includes leaflet widths up to 2 mm (Stern 1946:110). Both describe carpels with dense hair-covering. In *Paeonia tenuifolia* according to Anderson (1818:262) the flower is "supported on a very short peduncle and nestled as it were among the finely-divided leaves that crowd around the top of the stalk". In our collected plants there are several centimetres between the top leaf and the flower. The Norwegian and Swedish collections of what we call *Paeonia* x *hybrida* correspond in this matter. The roots of GH 2009 09 are spindle-shaped, hanging from caudex, which corresponds with *Paeonia tenuifolia*. The roots of *Paeonia anomala* are more like carrots (Hong 2010:128). If our plants are a crossing of these two species, should this be more present in the roots? We need a further investigation of this.

Knut Langeland has set up an overview of peonies sold by 49 nurseries in southern Norway between 1903 and 1961. None of these mentions Paeonia x hybrida, but Paeonia tenuifolia is mentioned by several. Plants like the ones described here are called "dillpion" in daily speech in Norway. There is reason to believe that the plant listed in the catalogues in fact are what we here call Paeonia x hybrida. This is supported by information in an e-mail from botanist Martin Hajman in Tromsø, who says Paeonia x hybrida was sold from the Bjørkås nursery in 1909 by the name Paeonia tenuifolia. He further states that the real *P. tenuifolia* will have problems growing in Tromsø, as the plant is a warmth-loving plant, growing naturally on the steppes of the Black Sea.

The name *Paeonia* x *hybrida* is accepted among gardeners in the Nordic Countries, and the name is accepted in both Swedish and Finnish nomenclature. At the clone archive in Alnarp, there are several accessions with small differences between them identified as *Paeonia* x *hybrida*. The name works among Nordic gardeners, and this is where it is supposed to work. They have a common understanding of the plant in question. I suggest the Norwegian name *herregårdspion* for this cultivar, as it corresponds with the Swedish and Finnish names.

Ringve 1978-448 Svinvik, disk and carpels.

GH 2009-09 Sørumsand, disk and carpels.





Ringve 1978-448 Svinvik, flower and foliage.

GH2009-09 Sørumsand, roots.







Tromsø 2004-120 Presteid, flower.

Tromsø 2004-120 Presteid, disk and carpels.





Paeonia 'Nordic Paradox' syn. Paeonia humilis flore pleno

Paeonia 'Nordic Paradox' was earlier known as Paeonia paradoxa var. fimbriata or Paeonia humilis flore pleno. This plant is only found growing in gardens. In 2015 I applied for approval of the cultivar name 'Nordic Paradox'. This was accepted by the American Peony Society, with the plant at Gamle Hvam museum as standard specimen. This plant grows today in parts of Finland, Sweden and Norway, in areas where timber trade is a traditional industry.

This plant probably belongs to the *Paeonia* officinalis-complex. It is similar in description to *Paeonia officinalis* ssp. *huthii*, but the flower is double and the leaves have a slightly different shape. The leaflets in 'Nordic Paradox' are broader, almost rhombic in shape.

The buds and flowers are raised above the foliage on long stems. The buds have straight sides, they are not rounded. The double flower is a mixture of broad petals and narrow staminodes. The latter are sometimes edged with pollen or traces of pollen. The staminodes have a small cleft in the upper end. True stamens are never present. The flower is smaller than those of 'Rubra Plena' and 'Rosea Plena'. The outer petals are flat, not bowl-shaped when the flower opens. The plant at Gamle Hvam got ripe seeds in the warm summer of 2018. *Paeonia* 'Nordic Paradox' is easily identified if you know it.

The roots of the plants at Gamle Hvam museum are a mix of different forms, sometimes spindleshaped, sometimes carrot-shaped tubers. The plant multiplies by horizontally running tubers, from which new shoots arise. The carpels, stems and lower sides of the leaves are hairy. The indumentum on carpels are not as long and silky as in *Paeonia* x *festiva*.

Illustration

GH 1980 01 *Paeonia* 'Nordic Paradox' Hvam, with *P.* x *festiva* 'Rubra Plena' to the left and 'Rosea Plena' to the right.



The 'Nordic Paradox' in the Gamle Hvam collection has probably been growing there since shortly after 1819. Its history is published in *By og bygd 47* (Marstein 2018). The 'Nordic Paradox' in the Ringve collection comes from a farm in Åsen, Trøndelag, where it grows in large numbers along the wall of an old farmhouse.

This cultivar is traced back to Leiden. A herbarium specimen from the end of the 17th century is found in the Hans Sloane herbarium in the Natural History Museum in London, by the name *Paeonia minore flore pleno*. This herbarium was collected by the Dutch botanist and physicist Herman Boerhaave (1668–1738) in Leiden. An image of this peony is found in Robert Sweet's *The British Flower Garden* 1823. Anderson mentions this cultivar in his monograph (1818:282):

Messrs. Lee and Kennedy have long possessed this plant; and Messrs. Loddiges and Son imported it from Holland under the name of the double-purple peony. It is the only plant among the pubescent species with double flowers.

It is not represented among the peonies in Olof Rudbeck's botanical work, with drawings of plants known in Sweden in the last half of the 17th century, published more than 300 years later as *Blomboken* (Martinsson and Ryman 2008).

My own investigations show that the plant probably came to Norway by the Norwegian timber trader John Collett, who lived in London for several years before he settled in Christiania (Oslo) in 1792. In Norway it is found in regions where Collett and his family owned properties and traded timber in the 18th and 19th century. In Sweden several specimens are collected by POM in the Östersund area, and in Finland Rea Peltola and Vesa Koivu have found it in south-western Finland (Peltola and Koivu 2007:122). Stern (1946:107) refers to Anderson's description (1818:282), and says the name *Paeonia paradoxa* var. *fimbriata* "must be rejected under Article 65 of the International Rules of Botanical Nomenclature since this epithet was based on a monstrosity." This monstrosity is our *Paeonia* 'Nordic Paradox'.

I suggest *Paeonia* 'Nordic Paradox' as botanical name.

I suggest the Norwegian name *sommerpion* for this cultivar. It corresponds with the Swedish and Finnish names *midtsommarpion* and *juhannuspioni*, and it is one of the names used for this plant in Solør, Hedmark.

Illustration

GH 1980 01 *Paeonia* 'Nordic Paradox' Hvam, flower with clefted staminodes.



GH 1980 01 Paeonia 'Nordic Paradox' Hvam, leaflets with almost rhombic shape.

GH 1980 01 Paeonia 'Nordic Paradox' Hvam, buds and flowers raised above the foliage.





Illustration

Paeonia 'Nordic Paradox' in British Flower Garden 1823, listed by the name *Paeonia paradoxa* var. *fimbriata*. The buds with straight sides and the staminodes with a cleft in the upper end are both specific *P*. 'Nordic Paradox' characters.



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Paeonia 'Nordic Paradox' Hvam, spindle-shaped roots.

Paeonia 'Nordic Paradox' Hvam, horizontally running tubers with new shoots.



Carpels of 'Nordic Paradox' Ringve 2005-254 to the left and 'Rubra Plena' Ringve 2008-224 to the right.

'Nordic Paradox' Ringve, disk and carpels.





'Nordic Paradox' Ringve, hairy stems.

'Nordic Paradox' Ringve, lower leaf surface.





Paeonia x festiva 'Rubra Plena' and 'Rosea Plena'

Paeonia x festiva 'Rubra Plena' has been growing in European gardens from the 17th century (Stern 1946:123ff). Basilius Besler's *Book of plants*, with drawings made in the first half of the 17th century and published in 2007, depicts both "Pæonia flore pleno incarnato" and "Pæonia polyanthos flore rubro" (2007:100f). The first one might be 'Rosea Plena'. The second one is supposed to be 'Rubra Plena'. These taxa are never found growing in the wild.

This plant is found in gardens from south to north in Norway. The flowers are large, double and of a deep red colour, with a diameter of 10-15 cm. The flowers of both cultivars are deep red when they open, but in 'Rosea Plena' they fade to almost white during the week they are in bloom. 'Rubra Plena' hardly fades at all. Both cultivars have flowers with up to 300 petals.

There are few problems associated with identification of these two cultivars. The leaves are dark green and shiny, and the plant is tall and lush. In Agder and at Gamle Hvam they are 70-75 cm tall. In Tromsø botanical garden they are shorter, but this might be due to the growing conditions. According to botanist Brynhild Mørkved, there are several vigorous, old specimens in private gardens in Tromsø³.

These plants are supposed to be old garden crossings between *Paeonia officinalis* and *Paeonia peregrina* (Oskarsson 2008:104, Hylander 1938:74). Hylander justifies this assumption by three characters recognizing *P. peregrina*, which are never to be found in wild growing *P. officinalis*:

- the middle leaflet often has three lobes
- the deep red colour
- the leaf upper surface has bristles along veins

Hopefully the DNA-samples can bring some clarity to this.

The bracts and sepals are larger than in any of the other peonies in this study. From the inner to the outer are first two or three large, rounded sepals, 2-4 cm long and with a thin red edge. Then comes two or three smaller sepals, usually with a short, sharp point at the end (mucronate), a long tail (caudate) or with a leaflike extension. The latter can be difficult to separate from the bracts, but if the lower part is wider than the upper part, they are sepals.

Illustration Agder 2006 0135 Rubra Plena



These peonies are called *bondepioner* (peasant's peonies) in the Nordic countries. The double red form is represented in *Blomboken* (Martinsson and Ryman 2008:358) from the latter half of the 17th century. Among the investigated plants there is a tendency that the Gamle Hvam specimens are larger and more vigorous than the rest. Gamle Hvam has an inland climate, and the soil is heavy clay. Maybe this suits the plants very well. In 2018 the *Paeonia* x *festiva* bloomed in Kristiansand the last week of May, at Gamle Hvam in the middle of June, and in Tromsø the second week of July. That is a difference of nearly six weeks from south to north.

I suggest we call these peonies *Paeonia* x *festiva* 'Rubra Plena' and 'Rosea Plena', with the Norwegian name *bondepion*.

Illustration

GH 2008 05 Rubra Plena bracts-sepals serie. The second from left is wider in the upper part than in the lower part and is therefore a bract. The third from left has a similar form, but is wider in the lower part and is therefore a sepal with a leaflike extension. Number four from left is caudate, and number three from right is mucronate.



Illustration

'Rosea Plena' on the top, 'Rubra Plena' below. The bud and leaves in the middle belong to 'Nordic Paradox'.



Leaflet with 3 lobes in GH 2007 17 'Rosea Plena'.

Bristles along veins in Ringve 2008 224 'Rubra Plena'.





Paeonia officinalis

Two of the plants from Gamle Hvam museum are identified as *Paeonia officinalis*. GH 2006 23 is collected from a farm in Høland, Akershus, where it was planted before 1940. Members of the same family have lived there ever since, and no one can tell where it came from.

According to Hong's description of *Paeonia* officinalis, the maximum leaflet width is 3 cm This plant has 3,5 cm as a maximum. Our flower has ten petals, while Hong states that the flower should have five to eight. Except from these two differences, our plant corresponds with Hong's description of *Paeonia officinalis* ssp. officinalis, with a natural population in the mountains of northern Italy, Croatia and Slovenia. The number of petals and he width of leaflets might be due to better growing conditions in gardens than in the wild.

The flower of GH 2006 23 is single, deep pink and large, 14 cm diameter when fully open. The foliage is glaucous and greyish, and the leaflet edge is wavy. The stems are curved and spreading, and the plant needs some support.





Illustrations (from top) GH 2006 23 *Paeonia officinalis* Høland, Akershus, flower.

GH 2006 23 Carpels and disk, yellow from pollen.

GH 2014 06 is collected from a garden in Ringsaker, Hedmark, where it grew when the present owner bought the place in 1986. The house was built in 1904. A widowed man with his son bought it in 1939. The father was a keen gardener, so this plant is probably after him.

The flower has nine to ten petals. It is single and small, less than 10 cm in diameter. The colour is deep purplish red at opening, but it soon fades to a pale pink.

The foliage is matt, but not glaucous. The leaf colour is greener than in the plant from Høland, and the stature of the whole plant is upright and tidy. The stems might be slightly bent, but not curved. The plant needs no support. The number of leaf segments never exceeds 18, which suggests it might be *Paeonia officinalis* ssp. *banatica*. The leaf edge is not wavy and it is red early in the season. The leaflets are 2-2,5 cm wide, which corresponds with Hong's description of this species.

Paeonia officinalis is very variable in nature, depending on the growing conditions. Both these plants correspond with the description of Paeonia officinalis, despite the differences we easily observe by looking at them. This confirms the importance of observing living plants. Clone archives are crucial in this work.

I suggest we call both these plants *Paeonia officinalis*, with the Norwegian name klosterpion for these single-flowered peonies.

Illustrations (from top) GH 2014 06 Paeonia officinalis Ringsaker, Hedmark.

GH 2014 06 *Paeonia officinalis* Ringsaker, Hedmark, flower colour at opening.





GH 2014 06 Paeonia officinalis Ringsaker, Hedmark, flower colour 6 days after opening.

GH 2014 06 Paeonia officinalis Ringsaker, Hedmark, carpels and disk.





Paeonia officinalis ssp. mollis or Paeonia officinalis 'Mollis'?

In the botanical garden in Tromsø grows a variety that is an enigma. The garden staff call it Paeonia mollis, but this is not a valid name. Huth (1892:273) calls Paeonia mollis a species dubia, which means it is a doubtful species. Stern (1946:108) puts it in the Officinalis group, and Hong does the same. This plant has never been found growing in the wild. Stern describes it as sterile, but Dick Westland, a Dutch member of the Facebook group "The Swedish Peony Society" says that this peony is a fertile hybrid, very easy to grow in Holland, where it grows to 50-60 cm⁴. Leena Liljestrand in the same group says they never grow taller than 50 cm in Mariestad, Sweden. Botanist Pavel Sekerka in Pruhonice botanical garden in Czech republic

has received plants from Tromsø. He says they grow taller in Tromsø than in Pruhonice.

This is not the only enigma connected to this plant. The divergence between Anderson's original description of Paeonia mollis (1818:282f) and the plants growing in Tromsø are striking. I will return to that, but first some of the Tromsø plants' history. Botanist Brynhild Mørkved has found some information on the import to the town: In 1896 the Bjørkås nursery was established by Severin Ytreberg (1864-1947). He ran the nursery until 1935, when his successors continued under the same name. Paeonia mollis appears in the nursery's price list in 1938. The diaries tell us it was imported from the Ruys' nursery in Holland (Mørkved 2015:298). This peony grows in several old gardens in Tromsø, and they probably all originate from the Bjørkås nursery.

Illustration Tromsø 2004-207 Paeonia officinalis 'Mollis'.



4 Facebook: The Swedish Peony Society, 04.01.2019.
In Tromsø arctic-alpine botanical garden there are several well-established specimens of this plant. The single flowers are large, between 12 and 17 cm in diameter, and the plants are 75-85 cm tall. The flowers fade slightly during flowering. The carpels, the sepals, the lower side of the the leaves and parts of the stem are densely hairy. This is probably why the plant is called *mollis*, which means soft.

Paeonia mollis was first described by George Anderson (1818:283). His plant grew in Loddiges' nursery in Hackney, London, from seeds received from Crimea. Anderson's original description reads as follows:

This plant is at first sight distinguishable from its congeners by its short, upright stalks, the dark blueish-green colour of its leaves, which are flat, compact, very much divided, the laciniæ crowded, overlapping each other, very woolly on the under-side, nowise bordered with red as in most of the others, and the lateral leaflets being almost sessile, the exterior side of each disposed to be decurrent. It is the most dwarf of all our species, seldom reaching eighteen inches in height, even in our gardens. The stalks as well as the primary petioles are nearly smooth. The flower is small, of a dark dull purplish-red, by no means handsome.

The Tromsø plant differs from this description in several ways. According to Anderson the plants never grow taller than 45 cm (18 inches). In Tromsø they grow to almost twice this height. Anderson describes the flower as "of a dark dull purplish-red, by no means handsome". The colour of the plants in Tromsø are purplish-red, but from our view they are handsome and absolutely not dull. Anderson's plant had flat leaves and short, upright stems. In Tromsø the leaves are wavy and the stems are curved. In Anderson's description the leaves are never bordered with red, but they are in Tromsø. Anderson describes the leaflets as almost sessile, which means without petiole, i.e. leaf stalk, and with a tendency to be decurrent, which means they are extended downwards along the petiole. This corresponds partly with the plants in Tromsø. The bluish-green colour often refers to a glaucous surface, like in the Tromsø plants. The leaflets are crowded and overlapping.

There are two early illustrations of *Paeonia mollis*. One was published in The Botanical Cabinet in 1827. This publication was in the hands of Loddiges' nursery from 1817 until 1833 (Jenny 2008:43). Loddiges grew the type specimen, from which the description was made by Anderson in 1818. This is the text following the illustration:

Illustration

Paeonia mollis The Botanical Cabinet 1263, 1827, drawing.



No.1263. PÆONIA MOLLIS. Class. Polyandria. Order Pentagynia. This is a native of parts of the Russian Empire; we have long had it in cultivation. It is perennial, of low growth, usually a little more than a foot, with thick stem, flowering in May. It will grow in any good garden soil, and is quite hardy, and not difficult to increase by dividing the roots. It was first described by Messrs. Sabine and Anderson, in their excellent monograph on Pæonias, in the Linnæan Transactions⁵.

This illustration is published by the nursery that grew the type specimen, and this illustration corresponds well with Anderson's description, but it does not correspond with the plants in Tromsø.

The second drawing is plate 474 from Volume 6 of *The Botanical Register*, published in 1820⁶.

5 https://www.biodiversitylibrary.org/item/91632#page/129/mode/1up 6 https://www.biodiversitylibrary.org/item/9042#page/128/mode/1up The leaves seems to be soft and overlapping, as we see in the Tromsø plants. The flower looks the same, too, but the illustration does not fit Anderson's description so well. The reference to Anderson in the text is not corresponding with his original description.

There is a lot to discuss here. Are these two different plants? How do latitude, temperature, light and humidity influence the plants growth? Tromsø is situated at 69 degrees north, with midnight sun from 20. May till 22. July. Hopefully the DNA results can give some more information. Until then I suggest we call these plants *Paeonia officinalis* 'Mollis' with the Norwegian name tromsøpion. In Sweden *luddpion* is an established common name.

Illustration

Paeonia mollis The Botanical Register 474, 1820, drawing.



474

PÆONIA mollis.

Downy-leaved Paony.

POLYANDRIA DIGYNIA (v. potide PENTAGYNIA).

Nat. ord. RANUNCULACER. Decand. syst. nat. 1. 127. Div. II. Ranunculaceæ spuriæ, Nempè antheris introrsis donatæ. PÆONIA. Suprà vol. 5. fol. 379.

P. mollis, foliolis ovali-lanceolatis planis lobatis imbricatis subtus cæsiopilosis, lateralibus subsessilibus, germinibus tomentosis rectis. Anderson in trans. linn. soc. 12, 282.

Preonia mollis. Sweet hort. sub. lond. 124.

Pæonia villosa. Desfont. cat. h. par. ed. 1. 126?; (si ita sit malè à Decandollæo ad PÆONIAM humilem relata.)

Radicis fibræ longæ, tuberibus longis terminatæ. Caulis pedalis et ultra, rigidus, strictus, pilosiusculus, densè foliosus. Petioli breves, suprà glabri, subtùs pilosiusculi; partiales undique pilosi. Folia dodrantalia, inæqualitèr subtriternata, complanata, horizontalia, saturatè cæruleo-viridia. Foliola lateralia, subsessilia, extùs decurrentia, profundè lobata, lato-lanceolata, plana, obtusa, imbricato-congregata venis fuscis parallelis, subtùs densè pilosa, glauca; suprà glabra, nitidiuscula. Bracteæ foliaceæ, integræ v. incisæ. Calycis foliola obtusa, exteriora pubescentia, integra. Germina 2-3 rectiuscula, adpressa, apice distantia, mollitèr pubescentia pilis ferrugineis. Semina æqualitèr ovata rugosiuscula, nitida. Anderson in loco citato.

"Although the Pæony here given is perhaps the least beautiful of that splendid genus, yet as it has not been any where described except in the place referred to, nor been figured in any publication, we feel ourselves authorized to lay it before our readers."

"Mr. Sabine, from whose collection the plant was described by the late Mr. George Anderson, procured it from Messrs. Loddiges and Sons, under the erroneous name of *anomala* (denoting a very distinct species); it had been cultivated some years in the nursery at Hackney, having been raised from seeds sent to the proprietors by Professor Pallas. It flowers in the month of May, and is probably a native of the southern districts of the Russian Empire, in or bordering upon the Crimea."

"The Downy-leaved Pæony is easily distinguished from its congeners by dwarf growth and rigid habit, by the peculiar crowding and overlapping of the lobes of the foliage, the upper surface of which is of a dark opaque green, and the

ī,

under very glaucous and woolly. The flowers are a dark purplish red, and appear imbedded in the leaves."

"PÆONIA villosa of the French Gardens seems to be a variety of this species, and consequently is improperly referred by Desfontaines in the Catalogue of the plants of the Royal Garden at Paris to PÆONIA humilis." Sabine MSS.

We have to thank Mr. Sabine, the Secretary of the Horticultural Society, for the liberal permission to engrave the annexed drawing by Mr. Hooker, and also for the communication of the above account of this nearly unnoticed species.

"Linnæus remarks, that though the most natural number of the germens in this genus is, in his opinion at least, two, they are often more numerous; but he thinks they scarcely ever amount to five. Some newly discovered species however contradict this, and indeed most of the old ones afford reasons, at one time or other, for the union of the Linnean Orders from Digynia to Pentagynia, in the Class Polyandria, into one; which is sanctioned also by DELPHI-NIUM, ACONITUM and others." Smith in Rees's cyclop. in loco.

The type of the genus seems confined to the northern hemisphere. No species has been observed in America.

Illustrations (from top)

Tromsø 2004 207 *Paeonia officinalis* 'Mollis', herbarium sheet. The petals are broad, almost round.

Tromsø 2004 207, *Paeonia officinalis* 'Mollis', leaf with decurrent leaflets to the left and sessile leaves in the middle of the photo.







Illustration

Tromsø 2010-153 Paeonia officinalis 'Mollis', carpels and disk.



The culturalhistorical aspect

Garden plants can tell stories about human contact. These plants have moved between people and their gardens. Soil and climate play a role for their well-being. In areas with a lot of rainfall and mild winters peonies will be susceptible to fungal attacks, which reduces the ornamental value.

Nevertheless, peonies are planted in gardens along the coast as well as in areas with inland climate. This illustrates the special value peonies have for gardeners. They are often inherited from close family members or friends, and people bring them to their new homes when they move.

This tradition of pass-along plants is strong in Norway, and peonies are the most appreciated species. People always remember who gave them their peony roots, and the plants become part of the family history. Åsen (2003:59) quotes a story from Gjerstad in Agder: "My mother got these dark red peonies on June 10th sixty years ago, when I was born, from the wife on the farm." Another story goes like this: "When I know the scent of these, I think of my both my grandmothers. They both grew this plant, and my maternal grandmother always brought me these for my birthday." A lady once showed me two pictures, one from the 1930s and one from today, of herself and the red peony in her childhood garden, still growing in the same spot.

To some people, garden plants are very important. They give them a sense of belonging and connection to their own past. This is why the title of the Finnish project: "Dear old peonies – garden treasures for the gene bank and to the market" is so appropriate. It reflects people's emotions connected to these plants.

In Norwegian nurseries

The garden writer Knut Langeland has created an overview of peonies sold in Norwegian nurseries. The material consists of 48 nursery price lists from southern Norway between 1903 and 1961. These nurseries are represented:

- J. Olsens enke AS, Oslo: 26 price lists
- Statens hagebruksskole, Dømmesmoen, Agder: 9 price lists
- Sandveds planteskole, Sandnes, Rogaland: 4 price lists
- Fritzøe planteskole, Larvik, Vestfold: 3 price lists
- Grudes planteskole, Sandnes, Rogaland: 2 price lists
- Grefsheim gård, Nes, Hedmark: 1 price list
- Kristiania planteskole, Oslo: 1 price list
- Two notebooks from the nursery at Norges Landbrukshøgskole (NLH) at Ås, Akershus, is included, too.

The results are:

- *Paeonia anomala* is mentioned only from NLH Ås in 1932.
- Paeonia tenuifolia is mentioned from Ås 1932, J. Olsens enke between 1927 and 1935 and from Dømmesmoen in 1932. We might suspect this is in fact Paeonia x hybrida.
- Paeonia humilis flore pleno/ Paeonia 'Nordic Paradox' is never found in the price lists. We find it in the Enumeratio plantarum 1825, which is one of the first plant lists from the botanical garden at Tøyen in Oslo, and in Norsk Havebog (Lundh and Hansen 1849:153).
- Paeonia festiva is found 17 times between 1903 and 1941 from Kristiania planteskole, J. Olsens enke, Dømmesmoen, Sandved and NLH Ås.
- Paeonia officinalis is only mentioned in 1925 and 1926 from J. Olsens enke, Oslo.

Compared to how often we find peonies in Norwegian gardens, the listings are few. This confirms the assumption that peonies are mostly pass-along plants, with an old history in families and between friends.

Summary

Paeonia anomala is maybe the only true species among the peonies in Norwegian clone archives. It has the best possibilities to be grown in the north, as it grows in natural populations from Siberia to Ponoy in the eastern part of the Kola peninsula.

Concerning *Paeonia officinalis*, the two plants in this study might be two different specimens of the wild species, which shows a great variation in nature. It is impossible to tell what the genuine and original species is like.

All the other plants in this study are probably crossings originating in culture. *Paeonia* x *festiva* grows in all the clone archives in Norway, and it seems to grow well both in northern and southern Norway. *Paeonia* x *hybrida* grows at Hvam, in Trondheim and in Tromsø. The true *Paeonia tenuifolia* is probably not to be found in old gardens in Norway. *Paeonia* 'Nordic Paradox' grows at Hvam and in Trondheim. *Paeonia officinalis* 'Mollis' grows only in Tromsø.

We are awaiting the DNA-results in excitement. Hopefully they can tell us more about differences and similarities, and about contacts between people in different parts of Finland, Sweden and Norway.

The project group will meet in June 2020 to discuss living plants compared to morphology and DNA-results.

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Contact us

Phone: +47 47 47 19 80 Email: post@mia.no

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