UNIVERSITAT POLITÈCNICA DE VALÈNCIA

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Deciphering the relationship between wild and cultivated compartment of Rosa gallica L.

Master's Thesis

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"Deciphering the relationship between wild and cultivated compartments of *Rosa gallica* L."

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Abstract

Rosa gallica is a wild species that distributes from Europe to western Asia. It was one of the first species of the genus *Rosa* to be cultivated in Europe and it is considered as one of the main ancestors of most garden rose cultivars. The classification of horticultural groups is based on phenotypic characteristics and parental origins, which are usually hypothetical. Therefore, the relationship between *R. gallica* and the horticultural groups is not clear. The main objectives of this study were to verify the genetic relationship between the wild populations of *R. gallica* and the horticultural groups of interest: Albas, Bourbons, Centifolias, Damasks, Hybrid Gallicas, Mosses, and Portlands; and evaluate the genetic relationship between these cultured groups. The first SSR-seq molecular markers for the genus *Rosa* were designed for this project, and bioinformatic techniques were used to determine the allelic dosage of polyploid genotypes. A total of 1613 individuals were genotyped, including wild species and cultivated groups of the genus *Rosa*, using 44 SSR-seq markers. The presence of clones, genetic diversity, population structure and differentiation were evaluated. The presence of clones was proven both in wild populations and in cultivated groups. There is an evident genetic relationship between the cultivated groups of interest and wild genotypes of *R. gallica*, especially with wild genotypes from France. The Bourbons were the only group whose relationships with *R. gallica* and the other cultivated groups of interest were less evident; and showed a greater relationship with wild and cultivated Asian genotypes. The classification of the cultivated groups was not supported by genetic evidence, suggesting that this classification has no genetic basis. Additionally, the hypotheses of the origins of the horticultural groups of interest are discussed.

Keywords: genetic diversity; genetic resources; structure analysis; wild-cultivated relationships; polyploids.

Resumen

Rosa gallica es una especie silvestre que se distribuye desde Europa hasta el oeste de Asia. Fue una de las primeras especies del género *Rosa* en ser cultivada en Europa y se considera como uno de los principales ancestros de la mayoría de los cultivares de rosas de jardín. La clasificación de los cultivares se basa en características fenotípicas y orígenes parentales, que usualmente son hipotéticos, por lo que la relación entre *R. gallica* y los grupos cultivados no es clara. Los objetivos principales de este estudio era comprobar la relación genética entre las poblaciones silvestres de *R. gallica* y los grupos cultivados de interés: Albas, Borbonianas, Centifolias, Damascenas, Híbridos de Gállica, Musgosas, y Portland; y evaluar la relación genética entre estos grupos cultivados. Los primeros marcadores moleculares SSR-seq para el género *Rosa* fueron diseñados para este proyecto, y se utilizaron técnicas bioinformáticas para la determinación de la dosis alélica de genotipos poliploides. Un total de 1613 individuos fueron genotipados, incluyendo especies silvestres y grupos cultivados del género *Rosa*, utilizando 44 marcadores SSR-seq. Se evaluó la presencia de clones, diversidad genética, estructuración y la diferenciación poblacional. La presencia de clones fue comprobada tanto en poblaciones salvajes como en grupos cultivados. Existe una evidente relación genética entre los grupos cultivados de interés y genotipos silvestres de *R. gallica*, especialmente con genotipos salvajes de Francia. Las Borbonianas son el único grupo cuyas relaciones con *R. gallica* y los demás grupos cultivados de interés fueron menos evidentes, y muestran mayor relación con genotipos salvajes y cultivados asiático. La clasificación de los grupos cultivados no fue respaldada por las evidencias genéticas, lo que sugiere que esta clasificación no tiene bases genéticas. Adicionalmente, se discuten las hipótesis de los orígenes de los grupos cultivados de interés.

Palabras clave: diversidad genética; recursos genéticos; análisis estructural; relación plantas silvestres-cultivadas; poliploides.

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1. Introduction

1.1 Controversy in Rose Classifications

The *Rosaceae* family is considered as the 19th biggest family of plants (Hummer & Janick, 2009). Its systematic classification has been a subject of controversy and challenges, with morphological determination proven to be insufficient (Tomljenovic & Pejić, 2018). The *Rosa* genus belongs to the *Rosaceae* family (Tropicos.org, 2022), its classification is complex, and two types of classifications are considered: botanical (wild species) and horticultural (cultivated roses).

In the last 200 years, *Rosa* taxonomy has been widely studied (Tomljenovic & Pejić, 2018). An estimate of 100 to 250 species is recognized (Smulders et al., 2011). The confusion in the classification of *Rosa* species arises from the use of morphological traits, as they are influenced by selection pressure and environmental factors; and the complicated evolutionary history of wild species together with a vast history of cultivation and interbreeding (Koopman et al., 2008). Factors explaining this complexity include extensive hybridization; absence of clear differences between many of the species, partly due to their recent radiation; incomplete lineage sorting (also refered as hemiplasy (Avise & Robinson, 2008)); and polyploidy; which can act in conjunction (Koopman et al., 2008).

In an attempt to overcome these difficulties, recent phylogenetic studies include both morphological and molecular tools (Tomljenovic & Pejić, 2018). Molecular phylogenetics have improved our understanding of relationships between species, as they aid in identifying clades that are not solely identified by morphological properties (Debray, 2020). However, molecular phylogenetics trees of roses usually lack support, therefore, relationships between groups are not well supported and difficulties in inferring the general evolution of the genus arise (Debray, 2020).

To date, the mostly used classification of the *Rosa* genus is the one proposed by Rehder (1940), which was updated by Wissemann (2017), and mainly constitutes the standard taxonomic treatment of the genus (Smulders et al., 2011). However, this classification could be obsolete as it derives from subdivisions made in the 20th century and arrangements of the 19th century (Fougère-Danezan et al., 2015). Wissemann (2017) divides the *Rosa* genus in four subgenus [*Hulthemia*, *Rosa*, *Platyrhodon*, *Hesperhodos*]; the subgenus *Rosa* in ten sections [*Pimpinellifoliae*, *Gallicanae*, *Caninae*, *Carolinae*, *Rosa*, *Synstylae*, *Indicae*, *Banksianae*, *Laevigatae* and *Bracteatae*]; and the section *Caninae* in six subsections [*Trachyphyllae*, *Rubrifoliae*, *Vestitae*, *Rubigineae*, *Tomentellae*, *Caninae*]. *Rosa gallica* is the only species classified in the *Gallicanae* section (Wissemann, 2017).

The taxonomic classification of *R. gallica* is summarized in **Table 1**. Synonyms of *R. gallica* include *R. provincialis* Herrm., *R. austriaca* Crantz, and *R. pumila* Scopoli non Jacq, nom. illegit (Wissemann, 2017).

***Table 1**. Taxonomic classification of R. gallica according to Tropicos.org (2022).*

Taxon	Name
Class	*Equisetopsida* C. Agardh
Subclass	*Magnoliidae* Novák ex Takht.
Superorder	*Rosanae* Takht.
Order	*Rosales* Bercht. & J. Presl
Family	*Rosaceae* Juss.
Genus	*Rosa* L.

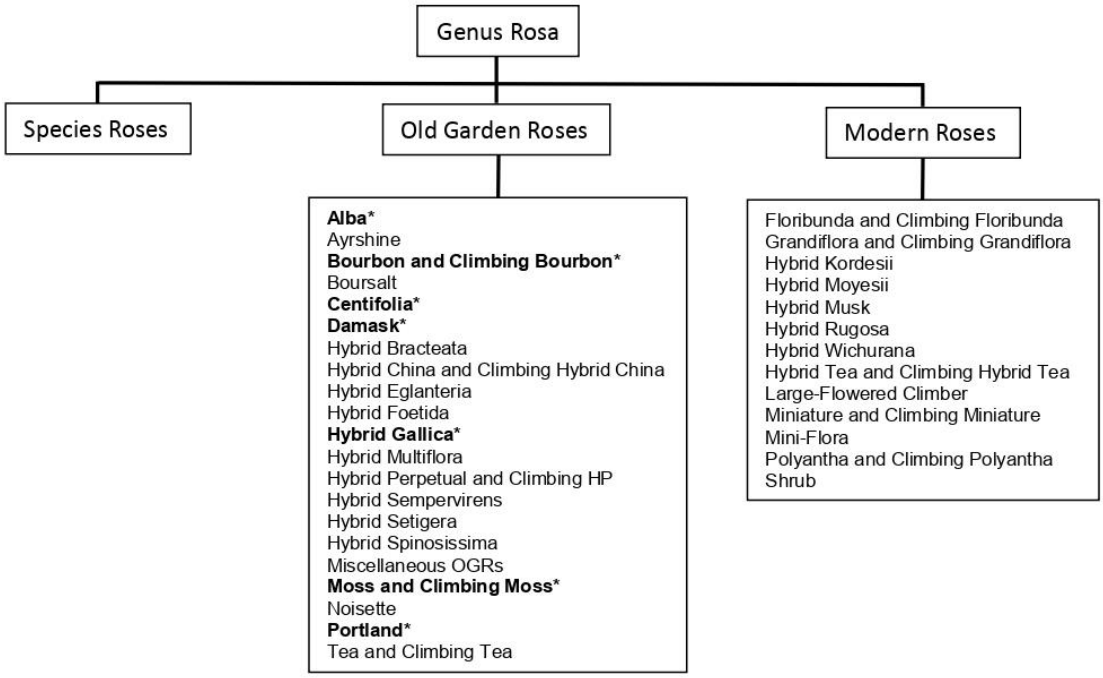

***Figure 1.** The American Rose Society Classification Scheme 2000, modified from (Cairns, (2003). * indicates the old garden groups of interest in this study.*

The horticultural classification is based on phenotype (Liorzou et al., 2016) or on the original parentage, which is often hypothetical (Scariot et al., 2006). Its was published by the American Rose Society (ARS) in 2000, grouping roses in 3 categories: species (wild roses), old garden roses (existing classes before 1867) and modern roses (non existing classes before 1867) (Cairns, 2003). The year 1867 is marked with the introduction of the very first Hybrid Tea, 'La France' (Cairns, 2003; Debray, 2020). According

to this classification, old garden roses are subdivided into 21 classes and modern roses into 13 classes (Cairns, 2003). *Rosa gallica* L. is classified in the Species Roses (or Wild Roses) section, and all the cultivated compartments of interest involved in this study belong to the old garden roses (**Figure 1**).

1.2 Economic Importance of Roses

Roses are the most economically important ornamental plants in the world, such success relies on their symbolism and aesthetics (Soufflet-Freslon et al., 2021). Uses of *Rosa* include cut flowers, landscape ornamentals, perfume oil, fruit production, and medicinal use (Hummer & Janick, 2009). As reviewed before, the section *Gallicanae* roses have a great relevance as landscape ornamentals, however other uses are also reported. Damasks are the main roses used for the production of essential oil, valued for the cosmetic and aromatherapy industry (El-Sharnouby et al., 2021). *Albas* and *Centifolias* are also used for oil production to a lesser extent (Shinwari & Shinwari, 2003). Rose oil has medicinal qualities which makes it relevant for medical purposes (Shinwari & Shinwari, 2003). Gallic roses were believed to be farmed 3000 years ago with aromatic and cosmetic purposes, as their dry petals retain their fragrance for a long period of time (Shinwari & Shinwari, 2003), also for pharmaceutical purposes in Provins, France during the Middle Ages (Pernet pers. com.). The multiple uses of roses were key factors for their domestication (Raymond et al., 2018), therefore it will be reviewed in the next subsection.

1.3 Domestication Process of Perennial Plants

In plants, perennials are species living more than 2 years, including herbaceous plants, woody shrubs and trees (Miller & Gross, 2011). Base on their life span, they are classified into short-lived perennials (3-5 years) and long-lived perennials (more than 5 years) (Miller & Gross, 2011). Domestication is defined as the evolutionary process driven by natural and human selection that leads to adaptation for the cultivation, consumption and utilization of plants (Gepts, 2014). The morphological, biochemical, and physiological traits distinguishing domesticated and wild individuals are called domestication syndrome, term defined by Gepts (2014). In perennials, these differences between wild and domesticated individuals are usually limited due to several factors including their extended juvenile phase, lengthy life cycle, high gene flow levels, and vegetative reproduction (Miller & Gross, 2011). Also, the domestication process of perennials is characterized by a relatively broad genetic bottleneck (Miller & Gross, 2011).

Roses are semiwoody, long-lived perennials, which can be reproduced and maintained through vegetative reproduction (Martin et al., 2001). The domestication process of the genus *Rosa* is poorly understood (Soufflet-Freslon et al., 2021). It was driven mainly due to their ornamental features, and medical and cosmetic values (Raymond et al., 2018). During the 18th and 19th century, the hybridization process of roses led to the development of Hybrid Teas (Liorzou et al., 2016). During this period,

crossing and hybridizations were performed between European and Asian genotypes (Liorzou et al., 2016; Martin et al., 2001). The European background had characteristics such as winter hardiness, resistance to pests, floral complexity, and flower doubling, while the Asian genotypes introduced characteristics such as recurrent flowering, color brightness, and tea perfume (Liorzou et al., 2016; Martin et al., 2001). To further understand the domestication process, the breeding history of *R. gallica* and the studied old garden roses is introduced in the next sections.

1.4 History of Rosa gallica L

Rosa gallica or "French rose" is considered as the first and oldest garden rose in the world (Renneberg et al., 2017) and the foundation species from which most garden roses evolved (Hurst, 1941). The flower of a wild *R. gallica* is shown in **Figure 2**. The origin of *R. gallica* is unknown, however, it is believed to be a hybrid between a European lineage of the section *Synstylae* and a common ancestor of *Synstylae* and *Caninae* sections that might not exist anymore (Debray, 2020). Wild populations distribute from Europe to Western Asia; and have produced many natural hybrids with other species, with uncertain knowledge of natural occurrence (ex: *R. alba*, *R. centifolia* & *R. damascena*) (Hurst, 1941; Wissemann, 2017). The domestication of wild rose species led to the spontaneous occurrence of interspecific hybrids, some only possible as roses from distant locations were placed together in gardens (Gudin, 2017).

Figure 2. Flower of wild *Rosa gallica*. Credits: Clowis Pawula.

The first Gallica cultivars were developed by Dutch breeders during the 18th century (Gardès et al., 2005). However, the first large rose collections of Gallica roses were developed in France during the the begginings of the 19th century under Napoleon 1st by Dupont, Godefroy, Vilmorin, and the Empress Josephine (Gardès et al., 2005). By mid 19th century, more than 2000 new varieties were developed by French rose breeders (Joyaux, 1998 as cited by Gardès et al. (2005)). The trend of the once-flowering

Gallica rose development decreased during the second half of the 19th century, as the fashion of recurrent Perpetual Hybrids emerged (Gardès et al., 2005).

1.5 Breeding of Old Cultivated Groups

Despite the great number of species in the *Rosa* genus, only between 8 to 20 species have been involved in rose breeding (Macphail & Kevan, 2009; Smulders et al., 2011; Vukosavljev et al., 2013). This uncertainty relies on the fact that controlled artifitial hybridization was not implemented by rose breeders until the 1830s and 1840s (Oghina-Pavie, 2015). Previous to artificial hybridization, breeding activities were documented, but the genealogical relationships were highly hypothetical (Proïa et al., 2019).

Evidence suggests *R. gallica* (directly or indirectly through hybrids) was involved in the breeding of old garden roses including Albas, Damasks, Gallicas, Centifolias, Mosses, Portlands and Bourbons (Koopman et al., 2008; Vukosavljev et al., 2013). Some examples of these cultivars can be seen in **Figure 3**. The ancestry of these old, cultivated groups is still in debate and different approaches can be found in the literature. Several hypotheses of the ancestry information are presented in **Table 2**, although more might exist.

Table 2. Ancestry information of Old Cultivated groups hypothetically derived from wild *R. gallica*.

Cultivar group	Ancestry information
Alba	Derived from *R. canina* and *R. gallica* (Atienza et al., 2005; Vukosavljev et al., 2013). Derived from *R. canina* and *R. damascena* (Hurst, 1941). Derived from *R. canina* and *R. gallica*, *R. damascena*, or other close tetraploid species (Liorzou et al., 2016).
Gallica	Exact ancestry unknown and other species may be involved (Vukosavljev et al., 2013).
Damask	Hurst (1941) presents 2 groups: summer damask roses (*R. gallica* x *R. phoenicia*) and autum damask roses (*R. gallica* x *R. moschata*). Complex hybrid of *R. gallica*, *R. moschata*, and *R. fedtschenkoana* (Iwata, Kato, & Ohno, 2000; Vukosavljev, et al., 2013). Contribution of *R. moschata/R. brunonii* (maternal lineage) and *R. gallica* (Debray, 2020). *R. moschata* as potential ovule donor and *R. gallica*, *R. fedtschenkoana*, *R. majalis,* and *R. davurica* as potential pollen donors (W.-H. Cui et al., 2022).

Cultivar group	Ancestry information
Centifolia	Complex hybrid of *R. gallica*, *R. phoenicia*, *R. moschata*, and *R. canina* (Hurst, 1941). Complex hybrid derived from Gallica and Alba or Damask roses (Vukosavljev et al., 2013). *R. gallica* as potencial ovule donor and as pollen donor *R. moschata* and *R. chinensis* "Old Blush"/*R. odorata* "Glandular Sepal" (W.-H. Cui et al., 2022).
Moss	Mutations of the Centifolia roses (Hurst, 1941; Scariot et al., 2006; Vukosavljev et al., 2013). Linked to Damask roses (Scariot et al., 2006).
Portland	Derived from Gallicas, Damasks, Centifolias, and Hybrid Chinas (Scariot et al., 2006). Hybrids of Gallica and Damask roses (Vukosavljev et al., 2013).
Bourbon	Probably a cross between Damask and Old Blush (Vukosavljev et al., 2013).

Figure 3. Cultivated garden roses of Madame Loubert Rose Garden, Pays de la Loire, France. **A)** Aimable Amie (Hybrid Gallica), **B)** Camaieux (Hybrid Gallica), **C)** Cuisse de Nymphe Emue (Alba), **D)** Jacques Cartier Blanc (Portland) **E)** Moise (Hybrid Gallica), **F)** Robusta Bourbon (Bourbon) **G)** *Rosa gallica* officinalis (Hybrid Gallica), **H)** Toussaint l'ouverture (Bourbon), and **I)** Tricolore (Hybrid Gallica).

1.6 Ploidy in Rosa gallica L and Old Cultivars

The chromosome number in the genus *Rosa* is based on a multiple of 7, normally ranging from 2n=2x=14 to 2n=8x=56 (aneuploids are rare) (Tomljenovic & Pejić, 2018), however decaploidy has also been reported (Jian et al., 2010). Although most of wild *Rosa* species are diploids (Smulders et al., 2011), *Rosa gallica* is an allotetraploid species (2n=4x=28) (Wissemann, 1999). As defined by Dufresne et al. (2014), an allopolyploid is a polyploid that originated by genome doubling after hybridization, therefore two homologous sets of the same chromosome exist. Generally, allopolyploids exhibit

disomic inheritance (Dufresne et al., 2014), however, the inheritance patterns in polyploid roses remain largely unknown (Proïa et al., 2019). Previous studies on tetraploid cut roses suggest a mixture between disomic and polysomic inheritance patterns in this particular group of roses (Bourke et al., 2017; Koning-Boucoiran et al., 2012).

It has been noted that interfertility between wild species is generally high, whenever the crosses are done between species of the same ploidy level (Smulders et al., 2011). Most cultivated garden roses are tetraploid and emerged from multiple generations of spontaneous or man-made crosses, containing multiple wild species in their ancestry (Smulders et al., 2011). Tetraploidy is reported for Centifolia, Damask, Moss, Gallica Hybrids, Portland and Bourbon groups (Liorzou et al., 2016); however, other ploidy levels can also be found within these groups (Grossi & Jay, 2002; Liorzou et al., 2016). Tetraploid prevalence in cultivars indicates that the hybridization has been more successful in this ploidy level, however, desirable traits such as plant vigor could have also been involved (Smulders et al., 2011). Polyploidy creates an increased segregation complexity, which hinders the genetic studies in roses (Leus et al., 2018), therefore, the next subsections of the introduction will address the type of molecular marker used, the complications in polyploid data analysis and the strategies that best suit the data used in this study.

1.7 SSR-seq Markers

SSR markers have been widely used to assess genetic diversity in roses (Smulders et al., 2019). Simple Sequence Repeats (SSRs) are co-dominant markers, characterized by their high level of polymorphism, reliability, and occurrence in nuclear and organellar genomes (Ben-Ari & Lavi, 2012; Šarhanová et al., 2018). Their genotyping technology involves the PCR amplification of specific loci using specific primers flanking a simple repeat consisting of 1-5 nucleotides (Ben-Ari & Lavi, 2012). Traditionally, allele information is obtained by recording the length of the amplified fragment assessed by capillary electrophoresis (SSR-ce) (De Barba et al., 2017; Šarhanová et al., 2018), which can create several genotyping drawbacks (i.e. size homoplasy = microsatellites alleles being identical in state [i.e. identical size], but not identical by descent (Estoup et al., 2002)), but can be improved when performing sequence-based genotyping.

The main advantage of sequence based SSR markers is that they provide the sequence information of the amplified microsatellite, therefore, allele determination is performed with greater accuracy (Curto et al., 2019; De Barba et al., 2017). High-throughout sequencing technology in SSR-seq markers enables a fast, efficient, and cost-effective genotyping for a large number of SSR loci with full automation through bioinformatics (De Barba et al., 2017). Allele dosage uncertainty persists when working with polyploids, however, methods with corrected SSR allele dosage are being developed (X. Cui et al.,

2022). Other than allele dosage, markers that require PCR amplification, involve other complications such as uneven amplification of alleles and possibility of null alleles (Dufresne et al., 2014). Despite these complications, SSR markers have been used to assess genetic studies in polyploid roses (Smulders et al., 2019).

1.8 Analysis of Polyploidy Genetic Data

The processes that influence the genetic variation in diploids and polyploids work differently (i.e. mode of inheritance and segregation patterns), therefore when analyzing such genetic variation, the interpretation of the results is different for diploids and for polyploids (Meirmans et al., 2018). Dufresne et al. (2014) highlight that many standard tools for population genetics analysis have been developed for diploids and are usuallly not suitable for polyploids. The theoretical basis of population genetics in polyploids is not always applicable because of the complexity in inheritance; allele dosage/copy number uncertainty and null alleles; and different ploidy within a taxon or closely related taxa included in the same analysis (Dufresne et al., 2014).

Hardy-Weinberg Equilibrium is usually an assumption involved in populations genetics analyses (Waples, 2015), and is affected by ploidy and inheritance patterns (Dufresne et al., 2014; Meirmans et al., 2018). Inheritance patterns cause methodological and conceptual challenges, specifically involving the allelic constitution (Dufresne et al., 2014). The allele dosage is a key factor in genetic analyses of polyploids as it allows to distinguish partial heterozygote genotypes (Meirmans et al., 2018). However, its determination is an important challenge when working with polylploids (X. Cui et al., 2022; Dufresne et al., 2014). Taking into account the implications of polyploids in genetic analysis, I will describe the consideration taken for the analysis of tetraploid *R. gallica*, especially focusing in the reviews of Dufresne et al. (2014) and Meirmans et al. (2018).

1.8.1 Genetic Diversity

Meirmans et al. (2018) mention that ploidy level must be considered when estimating expected heterozygosity and observed heterozygosity. Expected heterozygosity (*H*s), also referred as gene diversity, is a widely used index for assessing genetic diversity (Meirmans et al., 2018). Expected heterozygosity in diploids is calculated based on the complement of the expected frequency of homozygotes ($Hs = 1 - \sum p_i^2$); this same approach must be used for polyploids, as partial and full heterozygotes are classified equally in a single class (Meirmans et al., 2018).

For the observed heterozygosity (Ho), distinctions between partial and full heterozygotes need to be considered as they have different degree of heterozygosity (Meirmans et al., 2018). Moody et al. (1993) proposed estimating Ho using the concept of gametic heterozygosity. For tetraploids, it is defined by the frequency of heterozygotes among randomly sampled diploid gametes formed from

the 4 allele copies present at a locus (Meirmans et al., 2018). Even if it is unrealistic, it can be applied for higher ploidy levels, which permits the comparison between Hs and Ho (Meirmans et al., 2018).

1.8.2 Population Structure

In population genetic studies, the clustering approach is used to assess population structure (Meirmans et al., 2018). Cluster analysis groups similar observations into a number of clusters based on the observed values of multiple variables for each individual (Sinharay, 2010). It can be determined using various approaches including classical multivariate analysis, multivariate analysis adapted to genetic data, and model-based inferences (Meirmans et al., 2018). The ploidy levels, mode of inheritance, and the type of markers used are factors taken into consideration to determine the software availabe for data analysis (Dufresne et al., 2014).

Most clustering algorithms rely on allelic frequency (Stift et al., 2019). In polyploids, the main challenge in the genotyping process is the correct determination of allelic dosage, as dosage uncertainty would bias methods that rely on allele frequency-based inferences or requiring complete genotyping of individuals (Dufresne et al., 2014). For SSR markers, new methodologies are being developed to accurately infer polyploid genotypes with allele dosage correction (X. Cui et al., 2022; van Dijk et al., 2012).

STRUCTURE (Pritchard et al., 2000) is a Bayesian clustering approach, and is recommended for polyploids (Meirmans et al., 2018; Stift et al., 2019). The main assumptions of STUCTURE are Hardy-Weinberg equilibrium and complete linkage equilibrium between loci within populations (Pritchard et al., 2000). The use of Bayesian clustering on polyploids comes with potential problems, specially related to violations of the basic assumptions, although bias caused by these violations have not been studied with simulated data (Dufresne et al., 2014). As previously mentioned, *Rosa gallica* L. is an allotetraploid species (Wissemann, 1999), however its exact inheritance patterns are unknown. Corrected allele dosage can provide a better insight on the heterozygosity (X. Cui et al., 2022); therefore, Hardy-Weinberg Equilibrium in polyploids can be assessed (Meirmans et al., 2018).

Alternatively, the multivariate analyses adapted to genetic data, including Discriminant Analysis of Principal Components (DAPC) (Jombart et al., 2010) and Analysis of Molecular Variance (AMOVA)-based *K*-means (Meirmans, 2012), can be used for polyploid data (Meirmans et al., 2018). The DAPC uses Principal Component Analysis (PCA), Discriminant Analysis (DA), and optionally *K*-means clustering, to identify and describe clusters (Jombart et al., 2010). The AMOVA-based *K*-means uses the AMOVA framework and the K-means clustering to determine genetic structure (Meirmans, 2012).

1.8.3 Population Differentiation

In diploid populations, the degree of population differentiation is usually measured using the Fst statistic, which is determined by various factors including migration rate, mutation rate, and population size (Meirmans et al., 2018). Due to the higher number of chromosome copies in polyploids, the mutation events increase, and the impact of the migration rate is also higher (Meirmans et al., 2018). As explained by Meirmans & Hedrick (2011), the maximum value of Fst depends on the level of diversity within populations ($Fst_{(max)}$ = 1- Hs). The use of highly variable markers, such as microsatellites, usually result in populations with high genetic diversity value (Hs), causing Fst values to be low, especially in polyploids, as higher Hs values are usually obtained (Meirmans et al., 2018). These low Fst values do not directly translate in a underestimation of the degree of population differentiation, as it depends on mutation rate, but also migration rate and effective population size (Meirmans & Hedrick, 2011). The formula for the calculation of Fst for polyploids is as following:

$$\mathrm{Fst} = \frac{1}{1 + 2kNm + 2kN\mu}$$

Where: migration rate (m), mutation rate (μ), population size (N), and ploidy level (k).

Alternatives to estimate population differentiation in polyploids are discussed by Meirmans et al. (2018), indicating that the ρ statistic (Rho) developed by Ronfort et al. (1998), is the statistic of choice for population differentiation in polyploids. The advantages of ρ include independence of the rate of double reduction, ploidy levels, selfing rate, and the rate of tetrasomic inheritance; in addition, it has close relatedness with Fst (Meirmans et al., 2018; Meirmans & Van Tienderen, 2013). A disadvantage is that ρ may be underestimated with highly polymorphic markers, such as microsatellites (Meirmans et al., 2018). The formulas for the calculation of ρ statistic for polyploids is as following (Meirmans et al., 2018):

$$\rho = \frac{1}{1 + 2Nm + 2N\mu}$$

Where: migration rate (m), mutation rate (μ), and population size (N).

In terms of heterozygosities, the formula for ρ is as folliwing:

$$\rho = \frac{Ht - Hs}{Ht - Ho\,(k-1)/\,k}$$

Where: total heterozygosity (Ht), expected heterozygosity (Hs), observed heterozygosity (Ho), and ploidy level (k).

An alternative when using highly polymorphic markers is the D statistic developed by Jost (2008), which is independent of ploidy level, population size, and has a small bias in accordance to the tetrasomic inheritance rate (Meirmans et al., 2018; Meirmans & Van Tienderen, 2013). However, one of the disadvantages of D is that the time required to reach its equilibrium value can be very long (Meirmans & Hedrick, 2011). The formulas for the calculation of D statistic for polyploids is as following:

$$\mathrm{D} = \frac{1}{1 + m/(r\mu)}$$

Where: migration rate (m), number of populations (r), and mutation rate (μ).

In terms of heterozygosities, the formula for D is as folliwing:

$$\mathrm{D} = \left(\frac{r}{r-1}\right)\left(\frac{HT - Hs}{1 - Hs}\right)$$

Where: total heterozygosity (Ht), expected heterozygosity (Hs), and number of populations (r).

1.8.4 Resemblance Metrics

There are two main types of resemblance metrics used in genetics: distance metrics, which estimate the differences between individuals; and relatedness coefficients which estimate the degree of relatedness between individuals (Meirmans et al., 2018). They are used for determining genetic dissimilarities between individuals, clustering, diversity analysis, and studying relationships between individuals (Kosman & Leonard, 2005). The results strongly depend on the metric used; therefore, the selection depends on the data (Kosman & Leonard, 2005; Meirmans et al., 2018). For polyploids, inheritance patterns, type of marker, missing dosage, and ploidy levels are important considerations when selecting a resemblance metric (Dufresne et al., 2014; Meirmans et al., 2018). Meirmans et al. (2018) reviewed 8 metrics which could be used for polyploids with complete genotypes, while Dufresne et al. (2014) reviewed metrics for polyploids in general. Considering the fact that I was working with complete genotypes and the availability of GenoDive v3.06 (Meirmans, 2020), I decided to focus on distance metrics in (Meirmans et al., 2018). As explained by the authors, the four distance metrics reviewed are not efficient to compare between ploidy levels, but should not be problematic when working with a single ploidy level. Two key factors for my choice of distance metrics were: 1) all genotypes were considered as tetraploids; and 2) the presence of null alleles could not be discarded (See section 4.1.3 Null Alleles and Paralogs). Therefore, Chord distance (Cavalli-Sforza & Edwards, 1967) might be the most adapted distance for this data, as it is less sensitive to null alleles (Chapuis & Estoup, 2007; Séré et al., 2017).

1.9 Research Questions

The aim of my thesis is to answer the following questions:

- Is there any genetic relationship between wild *Rosa gallica* and the old, cultivated groups?
- What is the relationship between the old, cultivated groups?
- What are the origins of the old, cultivated groups?

2. Objectives

The aim of this project is to study the genetic relationship between wild *Rosa gallica* and the old, cultivated groups, providing a broader view of their breeding history. Wild populations of *R. gallica* and other *Rosa* species were used to test the hypothesis related to the breeding history of old garden roses groups Alba, Bourbon, Centifolia, Damask, Gallica, Moss and Portland (referred in this document as horticultural groups of interest). For this purpose, the following specific objectives are involved:

1. Unravel the genetic relationships between wild *Rosa gallica* and the horticultural groups of interest.
2. Study the genetic diversity of wild and cultivated roses using SSR-seq markers.
3. Study the relationships between the cultivated groups using genetic approaches, focusing on the horticultural groups of interest.
4. Provide an insight of the breeding history of the horticultural groups of interest based on genetic evidence.

3. Materials and Methods

3.1 Plant Material

A total of 1693 samples were studied, including wild *Rosa species*, *Rosa* hybrids, and cultivated genotypes. Cultivated genotypes included the following horticultural groups: Alba (A), Ayrshire (Ayr), Bourbon (B), Boursault (Boursault), Centifolia (C), China (Ch), Damask (D), Hybrid China (HCh), Hybrid Eglanteria (HEg), Hybrid Foetida (Hft), Hybrid Gallica (HGal), Hybrid Musk (HMsk), Hybrid Multiflora (HMult), Hybrid Perpetual (HP), Hybrid Rugosa (HRg), Hybrid Sempervirens (HSem), Hybrid Setigera (HSet), Hybrid Spinosissima (HSpn), Hybrid Tea (HT), Hybrid Wichurana (HWich), Interspecies (Intersp), Moss (M), Noisette (N), Portland (P), Polyantha (Pol), Species (Sp), Tea (T), and Unknown (U). Wild *R. gallica* individuals were from 15 countries: Austria, Bosnia, Croatia, Czech Republic, France, Germany, Hungary, Italy, Moldova, Poland, Romania, Slovakia, Slovenia, Spain, and Ukraine. Several other wild *Rosa* species and *Rosa* hybrid were also included. The storage of the leaf samples was performed by either silica gel or lyophilization.

3.2 DNA Extraction

DNA extractions were performed based on Keb-Llanes et al. (2002) and Debray (2020) with modifications. Modifications include the use of DeepWell 96 plates, a prewash step using Sorbitol wash buffer based on Inglis et al. (2018), the addition of RNase to the extraction buffer A (EBA), addition of Proteinase K to the extraction buffer B (EBB), incubation with extraction buffers for 1 hour while mixing every 15 minutes, and modifications to the centrifugation speeds for the DeepWell 96 plates. Lyophilised or silica dried, young leaves were the desired material for DNA extraction. However, the samples used also included old leaves and herbarium samples. The protocol is described in the next subsections.

3.2.1 Leaf Tissue Preparation

Approximately 30 mg of leaf tissue from each sample were grinded in DeepWell plates using a SPEX SamplePrep grinder. Samples were grinded for 1:30 minutes at 1500 rpm at least 3 times, until tissue maceration was ensured.

3.2.2 Prewash

The sorbitol wash buffer was made according to Inglis et al. (2018). 900 µl were added to each well in the Deepwell plates. The plates were closed, mixed by hand and vortexed until the leaf material was completely mixed with the buffer. The pellets were required to be resuspended, this process could be aided by pipet tips or other instruments. The plates were centrifuged at 2500 g for 5 minutes and the supernatant was discarded by using a multichannel pipet.

3.2.3 Extraction and Purification

For the extraction process, extraction buffers A (EBA) and B (EBB) were made according to Keb-Llanes et al. (2002), however RNase 20mg/ml (0.5µl/sample) was added to EBA and Proteinase K 800 U/ml (2µl/sample) to EBB. In each well, 200 µl of EBA, 600 µl of EBB and 70 µl of SDS 20 % were added and the plates were mixed by hand and/or vortexed. An incubation period at 65 °C was carried out for 1 hour, resuspending the samples by shaking each 15 minutes. The pellets were required to be resuspended completely by the second shaking process (after 15 minutes), this process could be aided by pipet tips or other instruments.

The plates were placed on ice and 410 µl of cold KAc were added in each well. The plates were sealed and mixed by inversion (10 times). After 5 minutes resting on ice, the plates were centrifuged at 4°C and 6200 rpm for 30 minutes. The KAc and the SDS form a semisolid layer in the surface. The liquid phase between the pellet and the semisolid layer was recovered using a pipet, trying to recover as much as possible without any contamination. Based on the amount recovered, 0.54 of isopropanol and 0.1 of sodium acetate were added to each well. The plates were incubated on ice for 20 minutes, followed by a centrifugation at 4°C and 6200 rpm for 30 minutes.

The supernatant was discated by inversion of the plates and 500 µl of ethanol 70 % was added on each well. The plates were vortexed at low speed to ensure the pellets were penetrated by the alcohol, followed by a centrifugation at 4°C and 6200 rpm for 10 minutes. This purification step with ethanol 70 % was carried out twice. After the supernatant was removed, the plates were left opened for the ethanol to dry completely. Finally, the DNA pellet was resuspended using 50 µl of TE 10:0.1 buffer (Tris-EDTA; 10mM Tris base, 0.1mM EDTA) .

3.2.4 DNA Quality Evaluation

The DNA purity of the samples was assessed with a spectrophotometer Nanodrop One from Thermo Fisher Scientific, using the TE 10:0.1 buffer as blank measure. This process was done on selected samples from every extraction plate to have an idea of the quality of the samples. An absorbance ratio greater than 1.8 (A260/280) was considered as reference for good quality samples. Considering that DNA was extracted from leaf tissues in several states (from lyophilized or silica dried, young leaves to herbarium samples), the results of the absorbance ratio (A260/280) and DNA concentration presented variations between samples. A purification process was implemented in samples that were visually dirty (ex: yellow-brownish color), modified from (Vilanova et al., 2020). The process is described as following:

The samples (approximately 50 µl) were transferred to 2 ml tubes. In each tube, 550 µl of TE buffer were added. Based on the volume of the sample, 1.5 of the volume composed of binding buffer (0.6

or 40 %) and absolute ethanol (0.9 or 60 %) were added on each tube. First the binding buffer was added and mixed gently by inversion until it was completely mixed. Then, the absolute ethanol was added and mixed gently by inversion until it was completely mixed. Then, 20 µl of silica matrix were added to each tube, followed by 5 minutes of mixing by orbital shaker. The tubes were centrifuged for 5-6 seconds, and the supernatant was discarted by decantation. 700 µl of ethanol 70 % were added to each tube. The tubes were shaken gently by hand until the silica was dispersed uniformly. Again, the tubes were centrifuged for 5-6 seconds, and the supernatant was discarded by decantation. The tubes were left open to dry at room temperature (approximatedly 5 minutes) until it was completely dry. 70 µl of TE buffer were added to each tube. The tubes were centrifuged at maximum speed for 15 minutes. Finally, 60 µl of supernatant were recovered from each tube and were transferred to new tubes.

For the rest of the samples, the quantification and normalization processes are explained in the next subsection 3.3 DNA Quantification and Normalization.

3.3 DNA Quantification and Normalization

DNA concentration was measured using the Hoechst 33258 reactive and a FLUOstar OMEGA spectrofluorometer from BMG LABTECH, using 96 well black plates. The preparation of the DNA concentration range was performed using a series of dilutions (3.13, 6.25, 12.5, 25, 50, 100 [all in ng/µL]) from a Lambda DNA at 500 ng/µl and TE 1X (**Table 3**).

Table 3. Dilutions perfomed to obtain the concentration range using Lambda DNA at 500 ng/µl.

Inicial concentration Lambda DNA (ng/µL)	DNA volume (µL)	TE 1X volume (µL)	Final Concentration (ng/µL)
500	5	20	100
100	5	5	50
50	5	5	25
25	5	5	12.5
12.5	5	5	6.25
6.25	5	5	3.13
0	0	5	0

A reactive mix of 2 µl Hoechst 33258 at 1 mg/ml, 2ml of TNE 10X, and 18 ml of MilliQ water was prepared for each 96-well black plate. Each well in the plates was filled with 200 µl of the reactive mix. One column was reserved for the DNA concentration range, 2 µl of each dilution were added and 2

wells were left as blank values with 2 µl of TE 1X (**Table 4**). For the rose DNA samples, 1µl was added to each well.

Table 4. Preparation of the DNA concentration range in the 96 well plate of quantification.

Column 1	A	B	C	D	E	F	G	H
Concentration(ng/µl)	100	50	25	12.5	6.25	3.13	0	0
DNA quantity (ng)	200	100	50	25	12.5	6.25	Blank (TE1X)	Blank (TE1X)

The fluorescence was determined using a FLUOstar OMEGA spectrofluorometer from BMG LABTECH, with a 350 nm bandwith exitation filter and a 460 nm bandwith emission filter (350-10/460-12). A standard curve with linear regression analysis was performed using the values of the Lambda DNA concentration range in Microsoft Excel. The DNA concentration of the rose samples was estimated based on the linear regression.

A PCR performance test was done with the nuclear SSR Rw55E12F on selected samples with low concentration DNA. Samples which failed to amplify, were further tested with a range of dilutions (1/2, 1/10, 1/25, 1/50/, and 1/100), to dilute putative PCR inhibitors in extracted DNA and determine a dilution ratio capable of amplifying the control SSR marker. For these samples, the best dilution ratio was used for the genotyping process.

DNA samples were normalized to 10 ng/µl to ensure PCR amplification conditions were the same for all the samples; 40 µl were prepared for each sample for the genotyping process,using MilliQ ultra pure water for the dilutions. The diluted samples were stored at -20 °C until the genotyping process.

3.4 SSR-seq Genotyping

The genotyping process was carried out at the Genome Transcriptome Facility of Bordeaux (PGTB) [https://pgtb.fr/] following the methodology established by Lepais et al. (2020) with modifications. The SSR-seq markers were previously developed for this study by Clovis Pawula and Olivier Lepais, using *R. chinensis* "Old Blush" genome developed by Hibrand Saint-Oyant et al. (2018) and modifications of other existant SSR markers from Hibrand-Saint Oyant et al. (2008), Süss & Schultze (2003), and Yan et al. (2005) (**Table 5**).

Table 5. SSR-seq markers used in the genotyping process. Gene proximity was determined within 2 kb.

SSR-seq	Chromosome number	Gene proximity
Rosa_Gal01_03 [a]	1	Intergenic
Rosa_Gal02_13 [a]	2	Intergenic
Rosa_Gal02_14 [a]	2	Close
Rosa_Gal03_15 [a]	3	Intergenic
Rosa_Gal03_25 [a]	3	Close
Rosa_Gal04_33 [a]	4	Intergenic
Rosa_Gal06_43 [a]	6	Intergenic
Rosa_Lab01-H9B07_07 [b]	1	Inside
Rosa_Lab05-RMS034_37 [c]	5	Insede
Rosa_Lab07-Rw5G14_54 [b]	7	Inside
Rosa_Trf02_08 [a]	2	Close
Rosa_Trf02_12 [a]	2	Intergenic
Rosa_Trf03_21 [a]	3	Close
Rosa_Trf03_23 [a]	3	Intergenic
Rosa_Trf04_27 [a]	4	Intergenic
Rosa_Trf05_35 [a]	5	Close
Rosa_Trf06_44 [a]	6	Close
Rosa_Trf06_47 [a]	6	Intergenic
Rosa_Trf07_53 [a]	7	Intergenic
Rosa_Gal01_01 [a]	1	Close
Rosa_Gal01_02 [a]	1	Close
Rosa_Gal01_06 [a]	1	Close
Rosa_Gal02_11 [a]	2	Close
Rosa_Gal03_19 [a]	3	Intergenic
Rosa_Gal04_26 [a]	4	Intergenic
Rosa_Gal04_32 [a]	4	Close
Rosa_Gal04_34 [a]	4	Close
Rosa_Gal05_38 [a]	5	Intergenic
Rosa_Gal05_41 [a]	5	Close
Rosa_Gal06_42 [a]	6	Close
Rosa_Gal07_48 [a]	7	Close
Rosa_Gal07_51 [a]	7	Close
Rosa_Gal07_55 [a]	7	Close
Rosa_Gal07_56 [a]	7	Intergenic
Rosa_Lab03-Rh58_24 [d]	3	Inside
Rosa_Lab06-CLROW2980_46 [b]	6	Inside
Rosa_Trf01_04 [a]	1	Close
Rosa_Trf01_05 [a]	1	Intergenic
Rosa_Trf04_30 [a]	4	Intergenic
Rosa_Trf04_31 [a]	4	Intergenic
Rosa_Trf05_39 [a]	5	Close
Rosa_Trf07_50 [a]	7	Close

SSR-seq	Chromosome number	Gene proximity
Rosa_Trf07_52 [a]	7	Intergenic
Rosa_Trf07_60 [a]	7	Close

[a] markers developed for this study using the reference and resequenced genome of Hibrand Saint-Oyant et al. (2018)

[b] modified from Hibrand-Saint Oyant et al. (2008)

[C] modified from Süss & Schultze (2003)

[d] modified from Yan et al. (2005)

I will briefly describe the genotyping process based on the workflow of Lepais et al. (2020), with some modifications. A multiplexing PCR was performed to amplify all loci simultaneously, improving the amplification homogenity and the coverage of sequence between loci (Chen et al., 2016). During the first round, a PCR with all the selected locus primers was performed. The second round was the indexing PCR, which added the Illumina sequencing adaptors and barcodes to assign each sequence to an individual. After quality check and quantification, sequencing using Illumina was performed at PGTB. The bioinformatics data analysis was performed following the workflow of Lepais et al. (2020), with the addition of a step from Cui et al. (2020) for allele dosage for polyploids.

The allele calling was done using FDSTools V1.2 pipeline (Hoogenboom et al., 2017) as described in Lepais et al. (2020) using the whole amplicon sequence. This analytical tool takes into account any polymorphism detected across the analyzed samples (SNPs, indels or variation in the number of repeated motifs), and integrates specific tools to detect true alleles from stutter mutations introduced during the amplification of SSR markers (Lepais et al., 2020). All individuals were considered as tetraploids and were coded as genotypes with estiamted allele dosage.

3.5 Data Exploration

3.5.1 Missing Data

The first filter applied was the removal of markers with > 60% of missing data (six markers). Later, an R Script developed by (Eveilleau, 2019) and improved by Bouillé (pers. com.) was used to filter the remaining data. First, individuals with > 50% of missing data were removed. Then the script optimized the remaining information by removing either markers or individuals to have at least 50% of common data between each pair of individuals. At the end of the process, 19 markers and 1540 individuals remained. The final selection of SSR-seq markers is presented in **Table 6**.

Table 6. SSR-seq markers used in the genotyping process of Roses. The initial percentage of missing data and the final selection of each marker is detailed.

SSR-seq	Percent of missing data (%)	Final Selection
Rosa_Gal01_03 [a]	25.28	No
Rosa_Gal02_13 [a]	53.51	No
Rosa_Gal02_14 [a]	22.50	No
Rosa_Gal03_15 [a]	66.33	No
Rosa_Gal03_25 [a]	6.14	Yes
Rosa_Gal04_33 [a]	37.57	No
Rosa_Gal06_43 [a]	36.74	No
Rosa_Lab01-H9B07_07 [b]	8.74	Yes
Rosa_Lab05-RMS034_37 [c]	36.86	No
Rosa_Lab07-Rw5G14_54 [b]	4.49	Yes
Rosa_Trf02_08 [a]	5.55	Yes
Rosa_Trf02_12 [a]	50.74	No
Rosa_Trf03_21 [a]	2.30	Yes
Rosa_Trf03_23 [a]	4.61	Yes
Rosa_Trf04_27 [a]	53.34	No
Rosa_Trf05_35 [a]	37.80	No
Rosa_Trf06_44 [a]	42.53	No
Rosa_Trf06_47 [a]	3.37	Yes
Rosa_Trf07_53 [a]	8.68	Yes
Rosa_Gal01_01 [a]	62.02	No
Rosa_Gal01_02 [a]	31.07	No
Rosa_Gal01_06 [a]	5.97	Yes
Rosa_Gal02_11 [a]	26.34	Yes
Rosa_Gal03_19 [a]	4.84	Yes
Rosa_Gal04_26 [a]	52.57	No
Rosa_Gal04_32 [a]	70.17	No
Rosa_Gal04_34 [a]	3.31	Yes
Rosa_Gal05_38 [a]	46.60	No
Rosa_Gal05_41 [a]	85.06	No
Rosa_Gal06_42 [a]	36.74	No
Rosa_Gal07_48 [a]	11.87	Yes
Rosa_Gal07_51 [a]	5.38	Yes
Rosa_Gal07_55 [a]	19.97	No
Rosa_Gal07_56 [a]	26.28	No
Rosa_Lab03-Rh58_24 [d]	16.83	Yes
Rosa_Lab06-CLROW2980_46	87.77	No
Rosa_Trf01_04 [a]	1.77	Yes
Rosa_Trf01_05 [a]	1.42	No
Rosa_Trf04_30 [a]	49.56	No
Rosa_Trf04_31 [a]	48.14	No

SSR-seq	Percent of missing data (%)	Final Selection
Rosa_Trf05_39 [a]	6.26	Yes
Rosa_Trf07_50 [a]	40.87	No
Rosa_Trf07_52 [a]	15.30	Yes
Rosa_Trf07_60 [a]	39.10	No

3.5.2 Clone Detection

The assignClones function from polysat V1.76 (Clark & Jasieniuk, 2011) was used to identify the clones. 88 individuals were genotyped twice and were used as control clones to establish the threshold for clone correction. Pairwise Euclidean distances were calculated between individuals. The threshold for clone detection was established based on the highest distances between control pairs.

3.5.3 Null Alleles and Paralogs

For null allele detection, I intended to use the inbreeding coefficient (Gis), as it can be used to detect possible null alleles and paralogs in SSR markers (Lepais et al., 2022). I decided to evaluate the inbreeding coefficient in wild *R. gallica* only. I considered that physical populations of wild *R. gallica* couldn't be used as populations, due to several reasons, especially involving the sampling process used and the reproduction of *R. gallica*. The sampling process of wild individuals was performed considering plots, defined as continuous areas covered by *R. gallica* individuals. Four samples per plot were obtained. Considering the clonal reproduction of *R. gallica* and the fact that the arrangement of the plants in the field didn't allow to clearly distinguish between different individuals, many samples from the same location might have been from the same genotype. Therefore, the physical populations usually don't have enough individuals to be considered as representative populations. My approach was to use population structure analysis to divide the wild *R. gallica* into genetic clusters and use them as populations to calculate the inbreeding coefficient.

As mentioned by my supervisors, some of the wild *R. gallica* individuals included in this study didn't perfectly match the description of the species. They suspected these individuals might have been from other species or hybrids. Therefore, I decided to evaluate the population structure on the dataset after clone correction (840 individuals and 19 SSR-seq markers) and then evaluate if the wild *R. gallica* clustered in different groups. Population structure was assessed using STRUCTURE Bayesian model (Pritchard et al., 2000). For STRUCTURE the following parameters were chosen: admixed model with a burnin period of 100,000, 100,000 iterations after burnin, loci independent between populations, 1 to 10 clusters, and 15 repetitions. The rest of the parameters were set to default. Structure Harvester Web v0.6.94 (Earl & vonHoldt, 2012) was used to determine the optimal k. Clumpp V1.1.2 (Jakobsson & Rosenberg, 2007) was used to using the individual information (indinfo file) and FULL Search

parameters, to determine the optimal alignments of the 15 replicate runs. The individual were assigned to the most probable cluster considering membership probability (MP) > 0.5. The individuals were considered confidently assigned when they had MP >= 0.8, and admixed when MP < 0.8.

The inbreeding coefficient was estimated with GenoDive V3.06 (Meirmans, 2020) using the heterozygosity based estimator (Gis) (Nei, 1987) with 999 permutations.

3.6 Data Analysis

Data analysis will be explained based on the hypothesis to be evaluated.

3.6.1 Relationships Between Wild R. gallica and the Cultivated Compartments

- To evaluate the genetic relationship between wild *R. gallica* and the cultivated compartments of interest, I decided to perform population structure analysis, diversity analysis and AMOVA. To evaluate this hypothesis, all wild and cultivated genotypes were used (840 genotypes).

Population structure analysis was performed in order to study the structure of the wild *Rosa gallica*, cultivated compartments, and other species of *Rosa*. This way, an insight of the relationships between the horticultural groups of interest with the wild *R. gallica* would be provided. Population structure was assessed using STRUCTURE Bayesian model (Pritchard et al., 2000), using the same parameters as explained in section 3.5.3 Null Alleles and Paralogs. Individuals having membership probability (MP) >= 0.8 to a cluster were considered as confidently assigned, and individuals having MP < 0.8 as admixed. The admixed individuals were assigned to the most probable group considering MP > 0.5.

To evaluate the variance between the identified clusters, AMOVA was conducted using GenoDive v3.06 (Meirmans, 2020). It was conducted using the Ploidy Independent Infinite Allele Model (Rho) and 999 permutations. Rho is an analogue of Fst, which is independent of the ploidy level and breeding system (Meirmans et al., 2018; Ronfort et al., 1998).

The diversity analysis as objective to evaluate the genetic diversity of the rose genotypes using SSR-seq markers. Genetic diversity analysis was assessed with GenoDive v3.06 (Meirmans, 2020). For each SSR, the number of observed alleles (Aoα), effective number of alleles (Aeα), Observed Heterozygosity (Ho) (Moody et al., 1993), Expected Heterozygosity (Hs) (Nei, 1987), and Inbreeding Coefficient (Gis) (Nei, 1987) were calculated.

3.6.2 Relationship Between Old, Cultivated Groups

- To test the genetic relationship between cultivated compartments, and possible origins, population structure analysis, AMOVA, distance analysis and pairwise genetic differentiation index were used. To test this hypothesis, only 288 genotypes of the cultivated compartment were selected. There was a problem with the initial database I used, and the subsampling of

the cultivated compartment wasn't done correctly. Some cultivated genotypes starting with "Rosa" (i.e. *Rosa alba*, *Rosa centifolia*, and *R. damascena*) were mistakenly included in the Other sp. section, and were discarded for this purpose.

The population structure analysis was performed using the same parameters previously specified. The aim was studying the population structure of the cultivated compartment and see the distribution of the horticultural groups of interest.

To study the population structure based on an analysis of variance, an AMOVA was performed using the previously identified clusters as populations, providing an insight of the among and within population variance. AMOVA was conducted using the same parameters as section 3.6.1 Relationships between wild *R. gallica* and the cultivated compartments.

To further study the genetic relationships between the cultivated compartment of interest, pairwise genetic differentiation was performed. To test the genetic differentiation between Albas, Bourbons, Centifolias, Damasks, Hybrid gallicas, Mosses and Portlands, the population differentiation index Rho (Ronfort et al., 1998) was selected based on its less sensitivity to ploidy level, selfing rate, and double reduction rate (Meirmans et al., 2018; Meirmans & Van Tienderen, 2013).

4. Results

4.1 Data Exploration

A total of 44 SSR-seq markers were used in the genotyping process of this study. Before filtering the data, the missing information per marker ranged from 1.42% to 87.77%, with an average of 30.15%. The initial number of genotypes was 1693.

4.1.1 Data Optimization

All markers having more than 60 % of missing data were removed (6 markers). Then, the optimization script by Eveilleau (2019) was used with automatic parameters and allowing up to 50% of marker removal. 1540 genotypes and 19 markers were kept. All the synthetic individuals (mix between two diploid genotypes) were removed (8), as they were not real plants (except tetra-ow9001-ow9007 due to an error in the database). At the end, 1532 genotypes were kept.

4.1.2 Clone Detection

To eliminate clones, Euclidean distances between the controls were used. The highest Euclidean distance between the controls was 4.7 (di-rarv_A and di-rarv_B). Genotype pairs having a Euclidean distance less than 4.7 were considered as clones, and only the genotype with the least missing data was kept. After the clone correction, 840 individuals remained. Therefore, 692 genotypes (45.1%) were

considered as clones. The complete list of genotypes eliminated by the clone correction process is presented in **Appendix 1**.

In total, 187 cultivated genotypes were eliminated based on clone detection by Euclidean distances. Horticultural groups included: Alba, Bourbon, Centifolia, China, Damask, Hybrid Eglanteria, Hybrid Gallica, Hybrid Multiflora, Hybrid Perpetual, Hybrid Rugosa, Hybrid Sempervirens, Hybrid Setigera, Hybrid Tea, Interspecies, Moss, Noisette, Shrub, Species, Tea, and Unknown horticultural group. A summary of the clones of horticultural groups of interest is presented in Table 7, indicating the number of individuals eliminated by the clone correction process.

Table 7. Number of genotypes eliminated of the horticultural groups of interest based on clone correction using Euclidean distances.

Horticultural group	Number of clones detected
Alba	5
Bourbon	14
Centifolia	21
Damask	16
Hybrid Gallica	67
Moss	18
Portland	0

For wild *R. gallica* 454 genotypes from 175 populations and 13 countries were considered as clones based on the clone correction process. A summary of the countries of these genotypes is presented in **Table 8**.

Table 8. Number of genotypes eliminated per country of wild *Rosa gallica* based on clone correction using Euclidean distances.

Country	Number of populations	Number of clones detected
Austria	13	32
Bosnia	2	2
Croatia	11	19
Czech Republic	7	15
France	96	278
Germany	7	17

Country	Number of populations	Number of clones detected
Hungary	2	4
Italy	9	23
Moldova	2	4
Poland	12	27
Romania	5	10
Slovenia	3	3
Spain	3	8
Ukraine	3	8
Unknown		4

In the other species category, interesting results were obtained. 51 clones from several *Rosa* species and other possible *R. gallica* related cultivars were identified. The *R. gallica* related cultivars include *R. centifolia*, *R. damascena*, *R. alba* and *R. gallica* var. *officinalis* (for more details see **Appendix 1**).

4.1.3 Null Alleles and Paralogs

4.1.3.1 General Population Structure

The Bayesian method based on STRUCTURE identified 2 clusters ($\Delta K = 5.960158$), as it was the highest peak in Delta K (Figure 4). From this analysis, I only considered the distribution of wild *R. gallica* genotypes. Most of the wild *R. gallica* genotypes (400) were grouped in Cluster 1 and a small group (20) was grouped in Cluster 2, which contained most of the other *Rosa* species (Figure 5).

Cluster 1 had genotypes from Austria, Czech Republic, Hungary, Italy, Moldova, Romania, Slovakia, and Ukraine. General Cluster 2 had wild R. gallica from Germany, Poland, Spain, Slovenia, Croatia, France and Bosnia, being Bosnia the only country present in Cluster 2 and not in General Cluster 1.

Therefore, I considered the population of "real" wild *R. gallica* as all the *R. gallica* genotypes having MP >= 0.8 to Cluster 1. The rest of the individuals were discarded from the analysis in section 4.1.3.2 Wild *R. gallica* Population Structure.

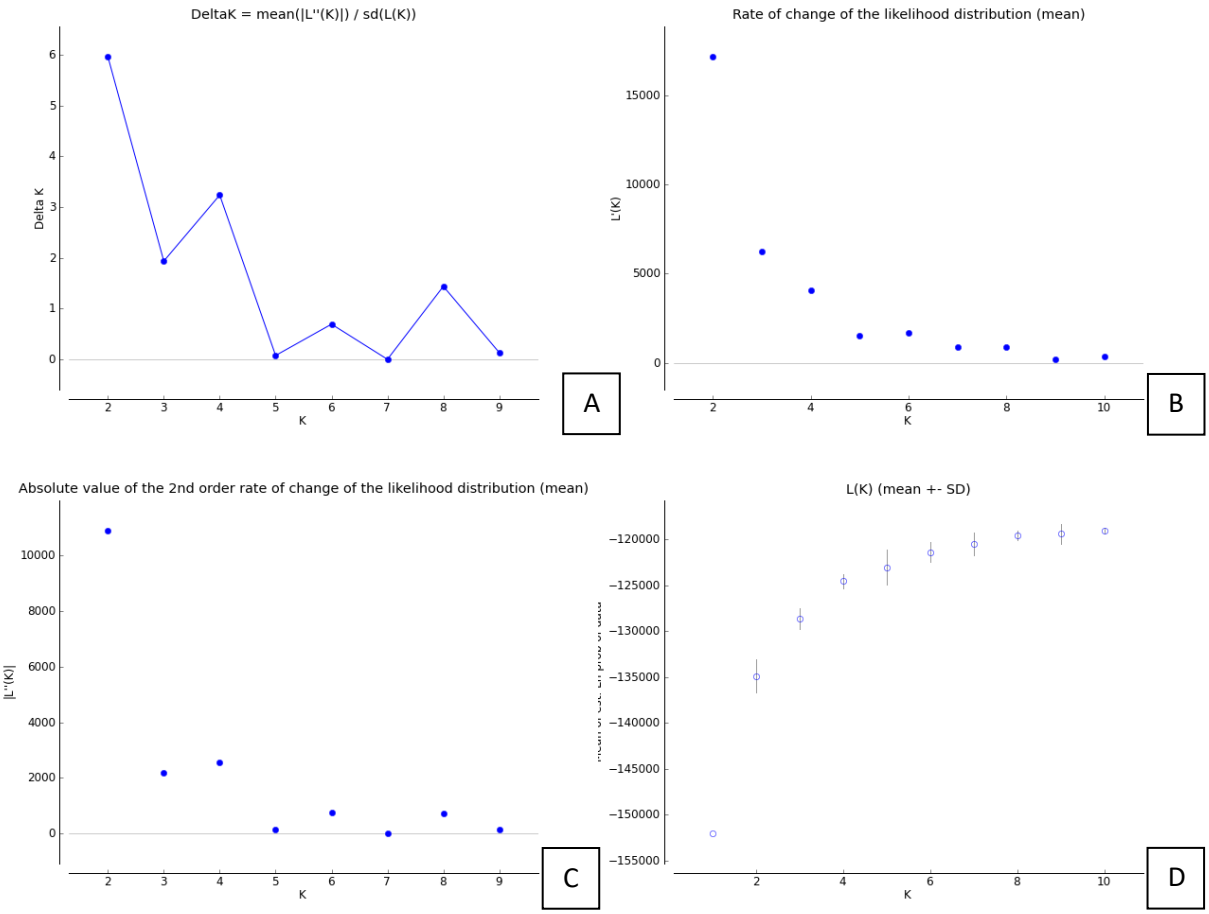

Figure 4. Structure Harvester results for the 840 genotypes analyzed using SSR-seq markers based on (Earl & vonHoldt, 2012). **A)** ΔK = mean (|L”(K)|)/sd(L(K)) indicating K2 as the maximum value; **B)** rate of change of the likelihood distribution (mean); **C)** absolute value of the 2nd order rate of change of the likelihood distribution (mean) **D)** mean of estimated Ln probability.

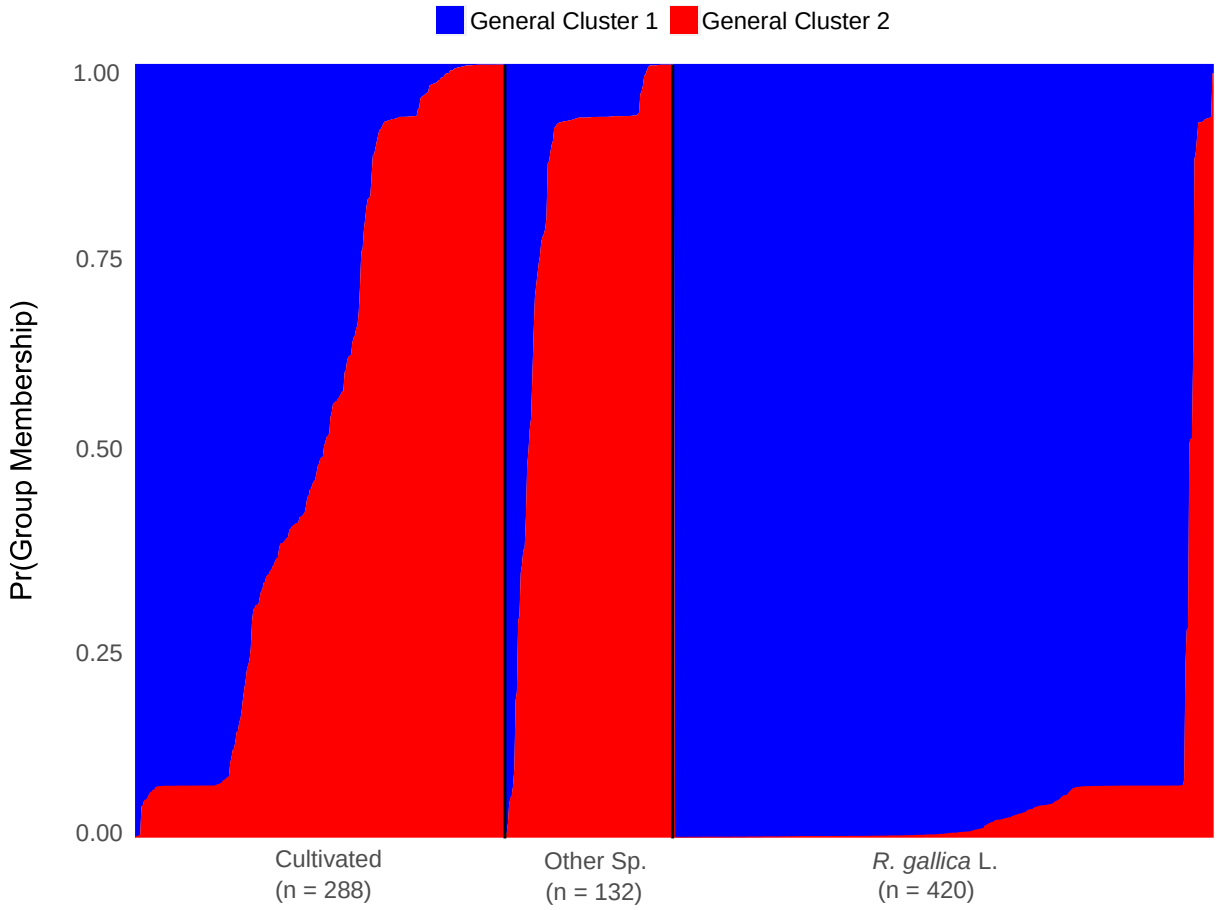

Figure 5. STRUCTURE results on the dataset after clone correction (840 genotypes and 19 SSRs). Two clusters were identified and for visualization purposes the individuals were separated in wild *R. gallica* L (*R. gallica* L.), other species (Other Sp.) and the cultivated compartment (Cultivated).

4.1.3.2 Wild R. gallica Population Structure

As explained before, the wild *R. gallica* genotypes (397) from Cluster 1 were used for the STRUCTURE analysis. Structure harvester determined 2 clusters ($\Delta K = 1409.90$) (Figure 6 & 7). The two clusters were used as populations for the inbreeding analysis dividing the populations by MP > 0.5. Wild *R. gallica* Cluster 1 contained 259 genotypes and Wild *R. gallica* Cluster 2 contained 138 genotypes. These 2 genetic clusters were used as population for the inbreeding analysis.

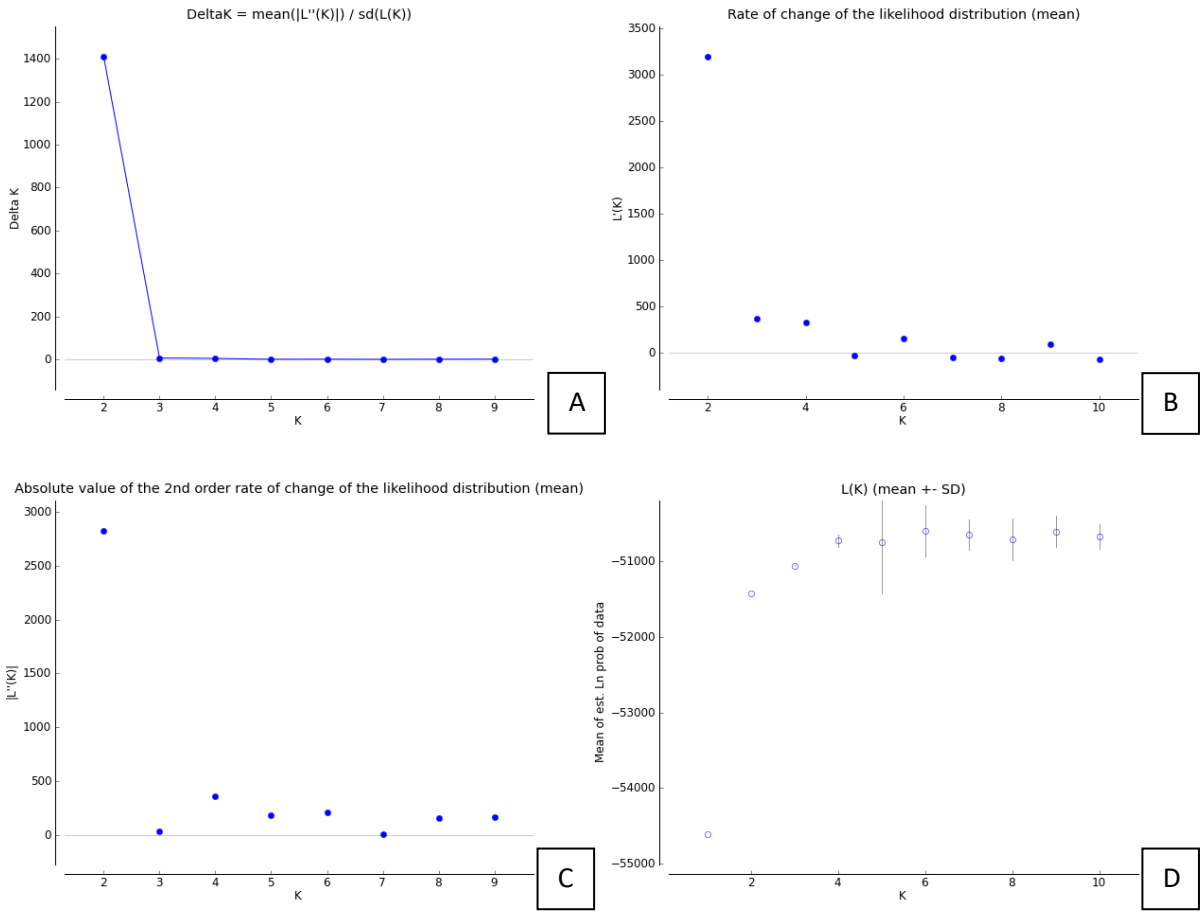

Figure 6. Structure Harvester results for the 397 wild *R. gallica* genotypes analyzed using SSR-seq markers based on (Earl & vonHoldt, 2012). **A)** ΔK = mean (|L”(K)|)/sd(L(K)) indicating K2 as the maximum value; **B)** rate of change of the likelihood distribution (mean); **C)** absolute value of the 2nd order rate of change of the likelihood distribution (mean) **D)** mean of estimated Ln probability.

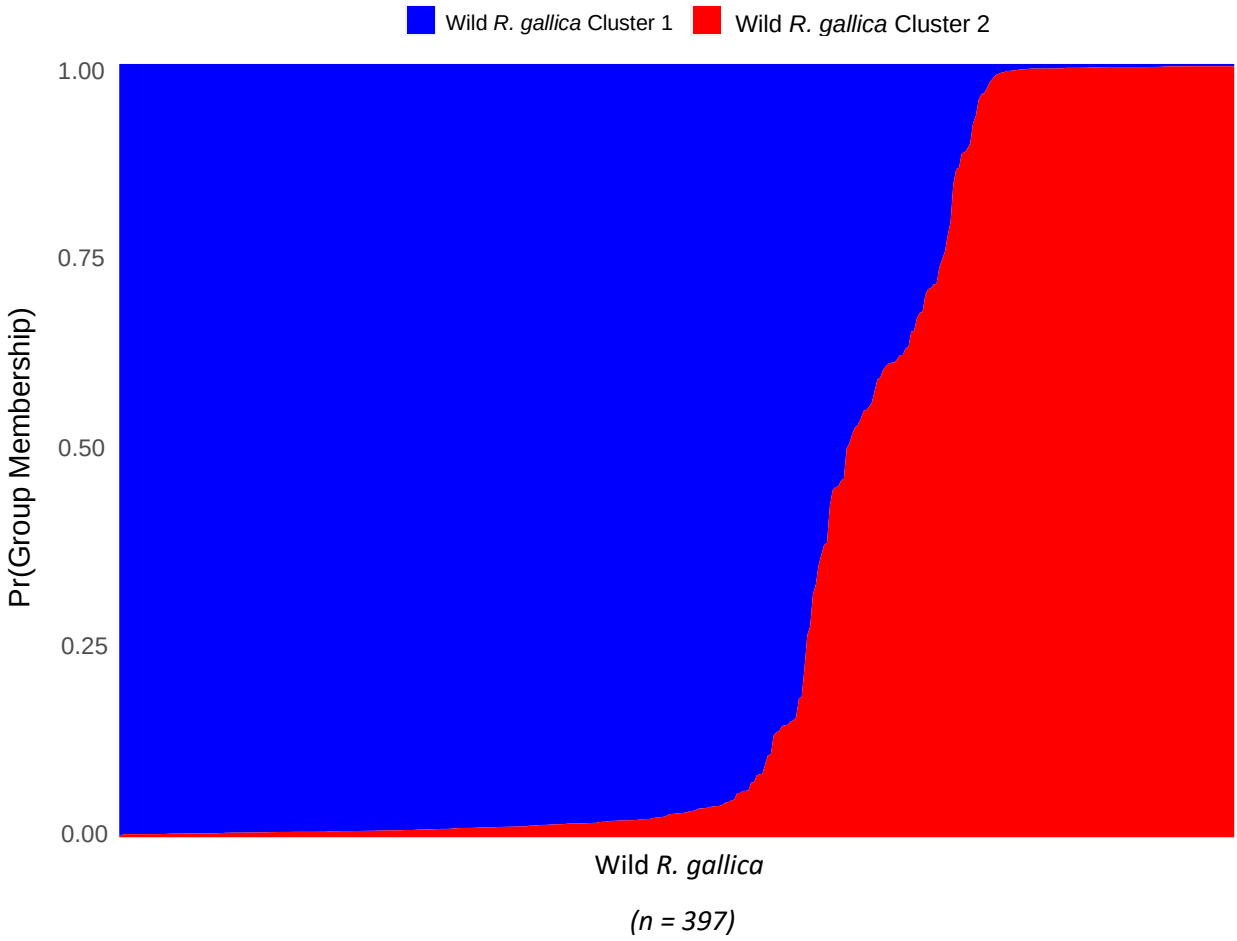

Figure 7. STRUCTURE results for the 397 wild *R. gallica* genotypes analyzed using SSR-seq markers.

4.1.3.3 Inbreeding Coefficient

With only two exceptions (SSRseq_Rosa_Lab01H9B07_07 and SSRseq_Rosa_Trf03_21), the inbreeding coefficient (Gis) was significant for both wild *R. gallica* clusters in most of the markers (**Table 9**). The significant positive values indicate a deficit of heterozygosity, which might also indicate the presence of null alleles. On the other side, significant negative values indicate an excess of heterozygosity, which might indicate paralogs. Since most of the markers had significant Gis, I decided not to eliminate any marker but to acknowledge the bias caused by null alleles in my results.

Table 9. Inbreeding coefficient Gis by group and by marker. Values with * are significant for heterozygosity deficit (Positive Gis value) or heterozygosity excess (negative Gis value) in test for HWE.

Marker	Cluster 1 Wild *R. gallica*	Cluster 2 Wild *R. gallica*	Overall Wild *R. gallica*
SSRseq_Rosa_Gal01_06	0.044*	0.013	0.028*
SSRseq_Rosa_Gal02_11	0.752*	0.599*	0.677*
SSRseq_Rosa_Gal03_19	0.446*	0.368*	0.409*
SSRseq_Rosa_Gal03_25	0.250*	0.264*	0.257*

Marker	Cluster 1 Wild *R. gallica*	Cluster 2 Wild *R. gallica*	Overall Wild *R. gallica*
SSRseq_Rosa_Gal04_34	0.224*	0.252*	0.239*
SSRseq_Rosa_Gal07_48	0.283*	0.329*	0.304*
SSRseq_Rosa_Gal07_51	-0.110*	-0.181*	-0.145*
SSRseq_Rosa_Lab01H9B07_07	-0.014	-0.020	-0.017*
SSRseq_Rosa_Lab03Rh58_24	0.442*	0.376*	0.409*
SSRseq_Rosa_Lab07Rw5G14_54	0.084*	-0.015	0.037*
SSRseq_Rosa_Trf01_04	0.010	-0.098*	-0.042*
SSRseq_Rosa_Trf01_05	-0.285*	-0.294*	-0.289*
SSRseq_Rosa_Trf02_08	0.089*	0.034*	0.061*
SSRseq_Rosa_Trf03_21	-0.015	0.024	0.004
SSRseq_Rosa_Trf03_23	-0.090*	0.256*	0.149*
SSRseq_Rosa_Trf05_39	0.149*	0.316*	0.199*
SSRseq_Rosa_Trf06_47	0.123*	0.032	0.090*
SSRseq_Rosa_Trf07_52	0.244*	0.179*	0.213*
SSRseq_Rosa_Trf07_53	0.160*	0.132*	0.148*
Multi-locus	0.161*	0.128*	0.146*

4.1.4 Final Samples

After all the filtering of the data, 19 SSR-seq markers were selected to study 840 genotypes. The classification of these individuals was: 420 wild *R gallica*, 288 cultivated garden roses, and 132 other *Rosa* species or hybrids potentially used during the breeding of the garden roses. The filtering resulted in reducing the average missing data percentage to 5.1%, ranging from 0.36% to 18.69%. The genotypes were divided into three categories: wild *R. gallica* (420), Cultivated compartment (288), and Other sp. (132). The Other sp. category was supposed to include only *Rosa* species other than *R. gallica* but, due a confusion with the database information, it also includes other cultivated genotypes starting with "*Rosa*" (i.e. *Rosa alba*) and some varieties of wild *R. gallica* (i.e. *Rosa gallica* var. *czackiana*).

4.2 Relationships Between wild R. gallica and the Cultivated Compartments

4.2.1 General Population Structure

The first hypothesis to be evaluated was the genetic relationship between wild *Rosa gallica* and the cultivated compartments, focusing on Alba, Bourbon, Centifolia, Damask, Hybrid Gallica, Moss and Portland genotypes. Since no SSR-seq marker was eliminated using the inbreeding coefficient, the STRUCTURE analysis from section 4.1.3.1 General Population Structure, will be used to describe this section. The Bayesian method based on STRUCTURE identified 2 clusters using the 840 individuals and SSR-seq 19 markers (ΔK = 5.960158) (Figure 4). Since all the dataset was used, I will refer to this clusters as General Cluster 1 and General Cluster 2. General Cluster 1 contained 565 individuals, with 493 genotypes confidently assigned to the genetic group (MP >= 0.8) and General Cluster 2 contained

275 individuals, with 224 genotypes confidently assigned to the genetic group (see **Appendix 2** for detailed information of each genotype). In total 123, genotypes were considered admixed, 72 with membership probability > 0.5 for General Cluster 1, and 51 for General Cluster 2. AMOVA determined the clusters were significantly different ($p < 0.001$). The within population variability was 77.2% and the among population variability was 28.2% based on Rho ($F = 0.228$).

General Cluster 1 included 400 individuals of wild *R. gallica* (397 confidently assigned and 3 admixed), therefore this cluster contains the majority of wild *R. gallica*. These wild *R. gallica* were from Austria, Croatia, Czech Republic, France, Germany, Hungary, Italy, Moldova, Poland, Romania, Slovakia, Slovenia, Spain, and Ukraine. Other species were represented by only 17 genotypes, 9 confidently assigned and 8 admixed. The confidently assigned species include *Rosa arvensis*, *Rosa arvensis* x *sempervirens*, *R. phoenicea*; wild *R. gallica* var. *czackiana* and *R. gallica x syns*; and Gallica Hybrids such a *R. gallica* var. *officinalis*. Admixed genotypes include *R. resemblant gallica* (possible *Synstylae*), *R. sempervirens, R*. *arvensis*; and cultivated genotypes as *R. centifolia, R damascena*, and Rosier de Provins (*R. gallica* var *officinalis*).

The cultivated compartment of General Cluster 1 included 148 individuals from 9 horticultural groups: Alba, Bourbon, Centifolia, Damask (9), Hybrid China (1), Hybrid Eglanteria (1), Hybrid Gallica (78), Hybrid Multiflora (2), Hybrid Perpetual (3), Moss (11), and Portland (12); additionally botanical species (5) and interspecies (4).

In total, out of the 148 cultivated individuals, 87 were confidently assigned. In **Table 10**, I summarize the information related to the horticultural groups of interest. These included 132 individuals, of which 79 were confidently assigned. Interestingly, the Alba group is the only one with no confidently assigned genotypes, their membership probability ranged from 0.51 to 0.70.

General Cluster 2 had only 20 wild *R. gallica*, 16 were confidently assigned and 4 were admixed. These admixed wild *R. gallica* were three individuals from Poland (MP between 0.51 and 0.62) and one from Germany (MP of 0.51). The confidently assigned *R. gallica* genotypes were from Spain, Slovenia, Bosnia, Croatia and France. This cluster contains 114 genotypes of other species, from which 100 were confidently assigned, and 14 were admixed.

The cultivated genotypes are the most numerous in this cluster, having 141 genotypes, from which 109 were confidently assigned and 32 were admixed. Horticultural groups are more numerous than in in cluster 1, having 24: Alba (7), Ayrshire (1), Bourbon (23), Boursault (1), Centifolia (4), China (2), Damask (1), Hybrid Eglanteria (1), Hybrid Foetida (1), Hybrid Gallica (19), Hybrid Multiflora (5), Hybrid Musk (1), Hybrid Perpetual (7), Hybrid Rugosa (1), Hybrid Sempervirens (2), Hybrid Setigera (2), Hybrid Spinosissima (2), Hybrid Tea (5), Hybrid Wichurana (1), Moss (9), Noisette (5), Polyantha (3), Portland

(5), and Tea (4). Additionally, 10 genotypes were of unknown horticultural group, 14 were botanical species, and 5 Interspecies. As important remarks, three Alba genotype were confidently assigned to General Cluster 2 and four were admixed; and 20 Bourbon genotypes were confidently assigned to General Cluster 2 and three were admixed.

Table 10. Assignation of the horticultural groups of interest to the clusters determined by STRUCTURE Harvester. G = number of genotypes, CA = confidently assigned genotypes, A = Admixed genotypes, and % = percentage of genotypes assigned to the cluster.

	General Cluster 1				General Cluster 2			
Horticultural Group	G	CA	A	%	G	CA	A	%
Alba	7	0	7	50.0	7	4	3	50.0
Bourbon	3	1	2	11.5	23	20	3	88.5
Centifolia	12	5	7	75.0	4	2	2	25.0
Damask	9	2	7	90.0	1	0	1	10.0
Hybrid Gallic	78	60	18	80.4	19	10	9	19.6
Moss	11	5	6	55.0	9	5	4	45.0
Portland	12	6	6	70.6	5	3	2	29.4
Overall	132	79	53	66.0	68	44	24	34.0

4.2.2 Diversity Analysis

To further study the groups, diversity analysis was performed using the clusters as populations. The selected SSR-seq markers were highly polymorphic, 1351 alleles were identified in total, with an average of 71.1 per primer pair (**Table 11**). The marker SSRseq_Rosa_Trf01_05 presented the lowest number of alleles (30), while SSRseq_Rosa_Trf07_53 had the highest (142). Gene diversity (Hs) ranged from 0.63 to 0.95, averaging 0.81, while observed heterozygosity ranged from 0.31 to 0.73, averaging 0.55. All gene diversity values were higher than observed heterozygosity values and the inbreeding coefficients were positive, indicating heterozygosity deficits for all markers.

Table 11. Genetic diversity of the markers used for the analysis. The table includes number of observed alleles (Aoα), number of effective alleles (Aeα), observed heterozygosity (Ho), expected heterozygosity (Hs), inbreeding coefficient (Gis), Chromosome (Chr), and percent of missing data (% Miss) per marker.

Marker	Aoα	Aeα	Ho	Hs	Gis	Chr	% Miss
SSRseq_Rosa_Gal01_06	111	3.703	0.638	0.731	0.126	1	5.24
SSRseq_Rosa_Gal02_11	87	9.836	0.313	0.900	0.652	2	18.69
SSRseq_Rosa_Gal03_19	46	7.604	0.475	0.869	0.453	3	4.17
SSRseq_Rosa_Gal03_25	78	2.986	0.392	0.666	0.411	3	6.31
SSRseq_Rosa_Gal04_34	47	3.609	0.438	0.724	0.395	4	2.38
SSRseq_Rosa_Gal07_48	39	7.565	0.440	0.869	0.493	7	11.43
SSRseq_Rosa_Gal07_51	39	4.217	0.613	0.764	0.198	7	3.69
SSRseq_Rosa_Lab01H9B07_07	73	8.017	0.708	0.876	0.192	1	3.10
SSRseq_Rosa_Lab03Rh58_24	72	3.628	0.410	0.725	0.435	3	14.29
SSRseq_Rosa_Lab07Rw5G14_54	59	9.007	0.679	0.890	0.237	7	2.26
SSRseq_Rosa_Trf01_04	43	5.993	0.690	0.834	0.173	1	0.83
SSRseq_Rosa_Trf01_05	30	3.344	0.594	0.702	0.153	1	0.36
SSRseq_Rosa_Trf02_08	60	10.060	0.730	0.901	0.190	2	2.02
SSRseq_Rosa_Trf03_21	88	7.407	0.683	0.866	0.211	3	1.19
SSRseq_Rosa_Trf03_23	59	2.732	0.429	0.635	0.324	3	2.86
SSRseq_Rosa_Trf05_39	35	5.141	0.443	0.806	0.451	5	5.71
SSRseq_Rosa_Trf06_47	102	5.801	0.616	0.828	0.256	6	1.19
SSRseq_Rosa_Trf07_52	141	18.311	0.621	0.946	0.343	7	7.38
SSRseq_Rosa_Trf07_53	142	12.206	0.678	0.919	0.262	7	3.81
Overall	71.1	6.904	0.557	0.813	0.314		5.1

4.2.3 Cluster Subdivision

To further understand the genetic groups, STRUCTURE was used on each previously identified General Cluster (MP > 0.5) to assess the population structure within the cluster. The aim of subdividing General Cluster 1 was to study the relationships within the wild *R. gallica* genotypes and their relationship with the horticultural groups of interest. The subdivision of General Cluster 2, aimed to unravel the relationship of the horticultural groups of interest least clustered with wild *R. gallica*.

4.2.3.1 General Cluster 1 Subdivision

General Cluster 1 was subdivided into 2 cluster (called Cluster 1.1 and Cluster 1.2) (ΔK = 1054.5) (**Figure 8 & 9**). Cluster 1.1 had 293 individuals, 261 confidently assigned and 32 admixed. Cluster 1.2 had 272 individuals, 223 confidently assigned and 39 admixed (see **Appendix 3** for detailed information each genotype). The AMOVA also determined significant differences between the clusters (Rho F=0.149,

p<0.001), with a within population variation of 85.1% and an among population variation of 14.5%. The Rho distance between the clusters was 0.133.

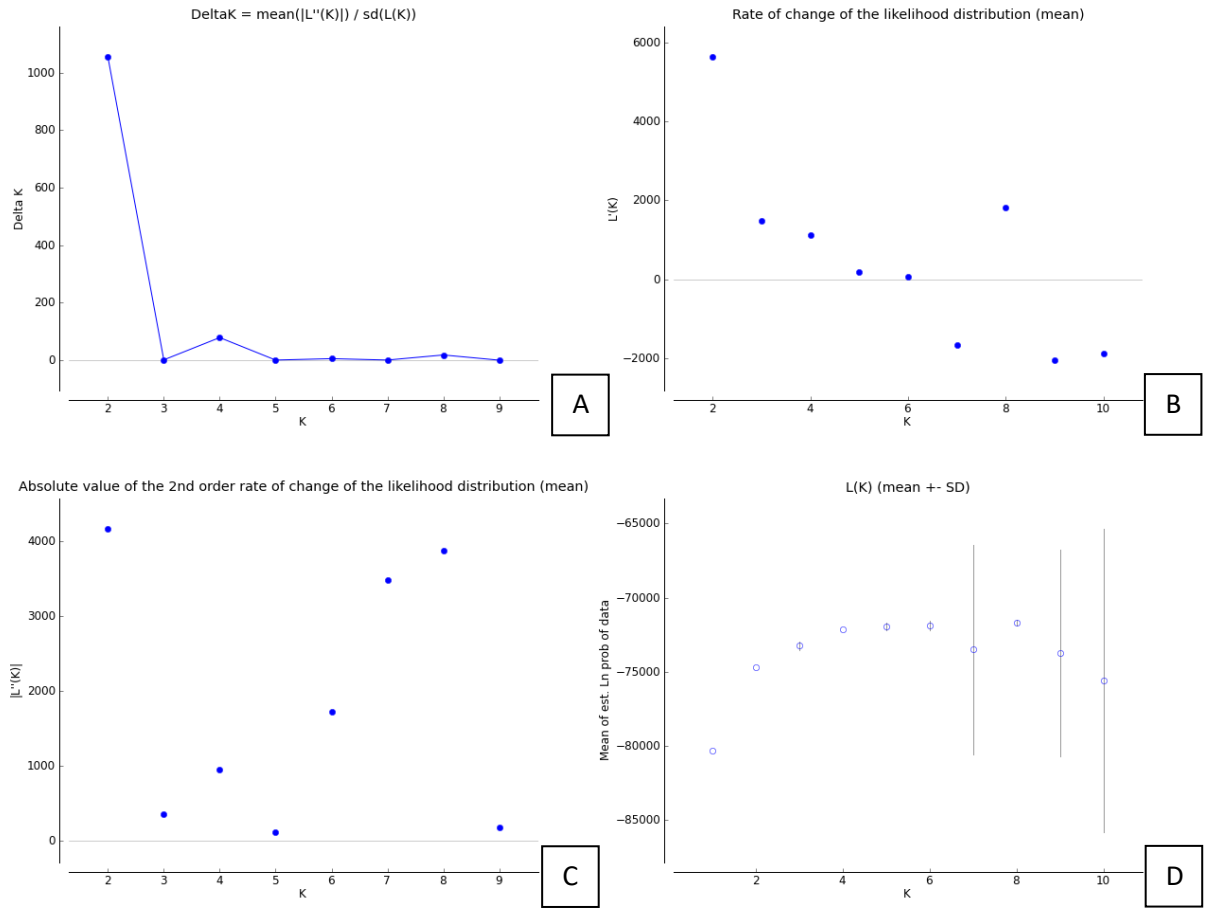

Figure 8. Structure Harvester results for General Cluster 1 subdivision analyzed using SSR-seq markers based on (Earl & vonHoldt, 2012). **A)** ΔK = mean (|L”(K)|)/sd(L(K)) indicating 2 as the maximum value; **B)** rate of change of the likelihood distribution (mean); **C)** absolute value of the 2nd order rate of change of the likelihood distribution (mean) **D)** mean of estimated Ln probability.

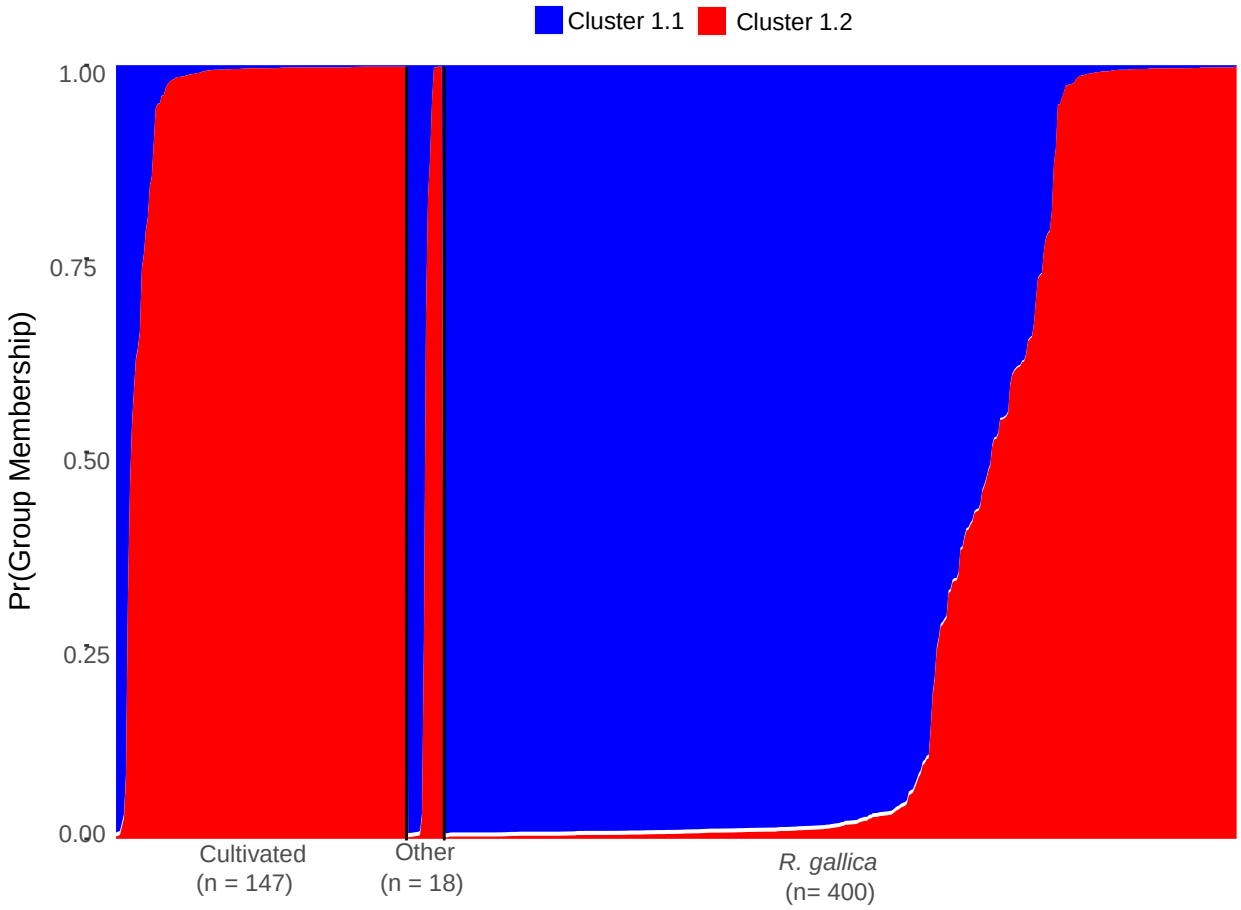

Figure 9. STRUCTURE results on the subdivision of General Cluster 1. Two clusters were identified and for visualization purposes the individuals were separated in wild *R. gallica* L (*R. gallica* L.), other wild species (Other Sp.) and the cultivated compartment (Cultivated).

This further structure analysis reveals two interesting facts. First, that Cluster 1.2 contains 94.6% of the cultivated compartment (131 confidently assigned and 8 admixed); and Cluster 1.1 only 5.4% cultivated genotypes (6 confidently assigned and 2 admixed). The summary of the horticultural groups of interest is presented in **Table 12**.

Table 12. Assignation of the horticultural groups of interest to the clusters determined by STRUCTURE Harvester. G = number of genotypes, CA = confidently assigned genotypes, A = Admixed genotypes, and % = percentage of genotypes assigned to the cluster.

	Cluster 1.1				Cluster 1.2			
Horticultural Group	G	CA	A	%	G	CA	A	%
Alba	0	0	0	0	7	5	2	100
Bourbon	0	0	0	0	3	3	0	100

	Cluster 1.1				Cluster 1.2			
Centifolia	0	0	0	0	12	11	1	100
Damask	1	0	1	11.1	8	8	0	88.9
Hybrid Gallic	5	4	1	6.4	73	72	1	93.6
Moss	0	0	0	0	11	11	0	100
Portland	0	0	0	0	12	12	0	100
Overall	6	4	2	4.5	126	122	4	95.5

The second interesting fact is the clustering of *R. gallica*. Cluster 1.1 contains 276 wild *R. gallica* genotypes from 13 different countries: Austria, Croatia, Czech Republic, France, Germany, Hungary, Italy, Moldova, Poland, Romania, Slovakia, Slovenia, and Ukraine. Cluster 1.2 contains 124 *R. gallica* genotypes from three countries: Spain, Germany and France. Spain and Germany only had one genotype each, which were admixed (MP of 0.728 and 0.776). The rest of the individuals (122) were from France (94 confidently assigned and 28 admixed).

From the Other Sp. category, the relevant information obtained was that *R. gallica* var. *officinalis*, one of the oldest known Hybrid Gallicas, was an admixed genotype, belonging mostly to Cluster 1.2. Other hybrid gallicas such as *R. centifolia*, *R. damascena* and Rosier de Provins were also grouped in Cluster 1.2.

4.2.3.2 General Cluster 2 Subdivision

General Cluster 2 was subdivided to have a better insight in the cultivated compartments which were less clustered with wild *R. gallica*, especially Bourbons. Cluster 2 was subdivided into 2 cluster (called Cluster 2.1 and Cluster 2.2) ($\Delta K = 6.72$) (**Figure 10 & 11**). Cluster 2.1 had 133 individuals, 126 confidently assigned and 7 admixed. Cluster 2.2 had 142 individuals, 131 confidently assigned and 11 admixed (see **Appendix 4** for detailed information of each genotype). For the subclusters of General Cluster 2, the AMOVA determined significant differences between the subdivided clusters (Rho F= 0.205, $p<0.001$) with a within population variability of 79.5% and an among population variability of 20.5%. The Rho distance between the 2 clusters was 0.175.

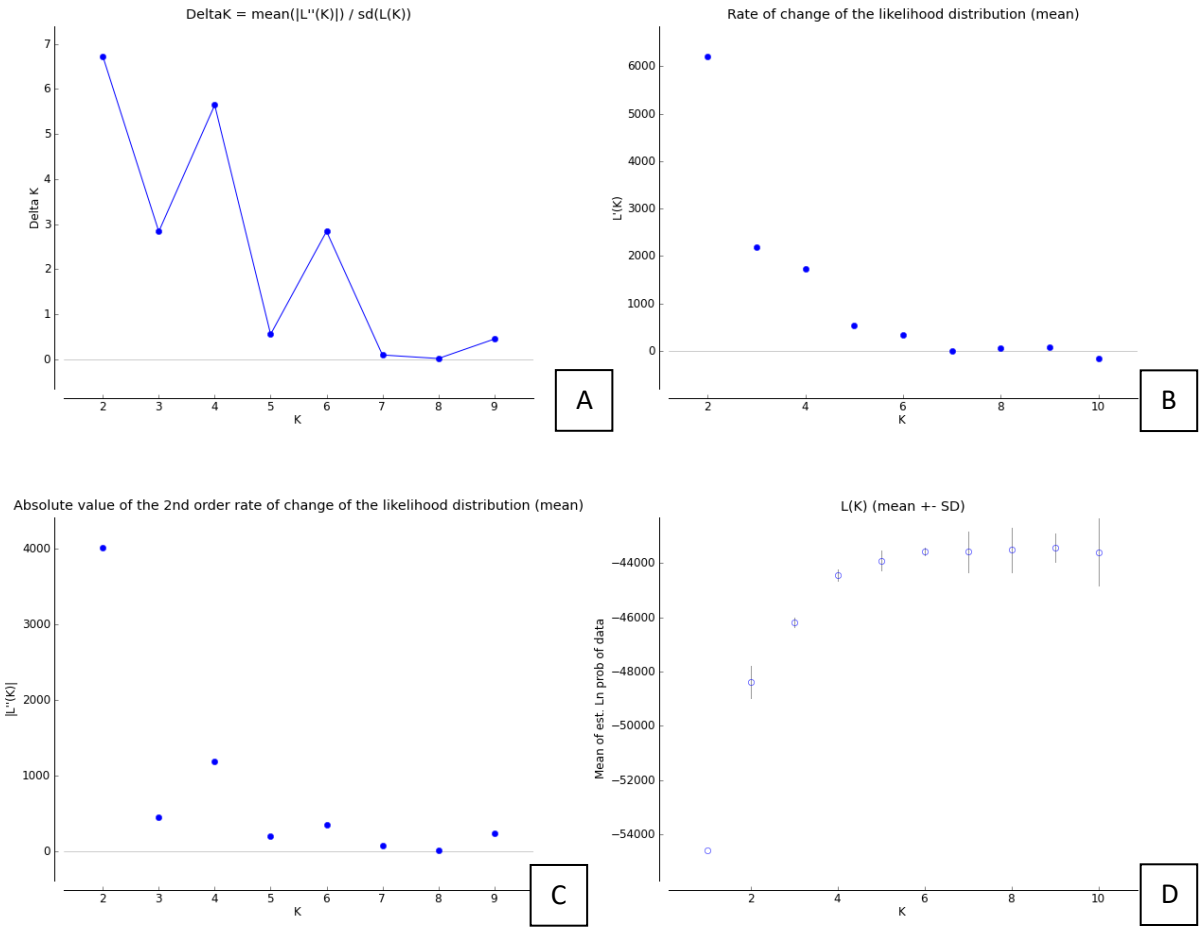

Figure 10. Structure Harvester results for General Cluster 2 subdivision analyzed using SSR-seq markers based on (Earl & vonHoldt, 2012). **A)** ΔK = mean (|L”(K)|)/sd(L(K)) indicating 2 as the maximum value; **B)** rate of change of the likelihood distribution (mean); **C)** absolute value of the 2nd order rate of change of the likelihood distribution (mean) **D)** mean of estimated Ln probability.

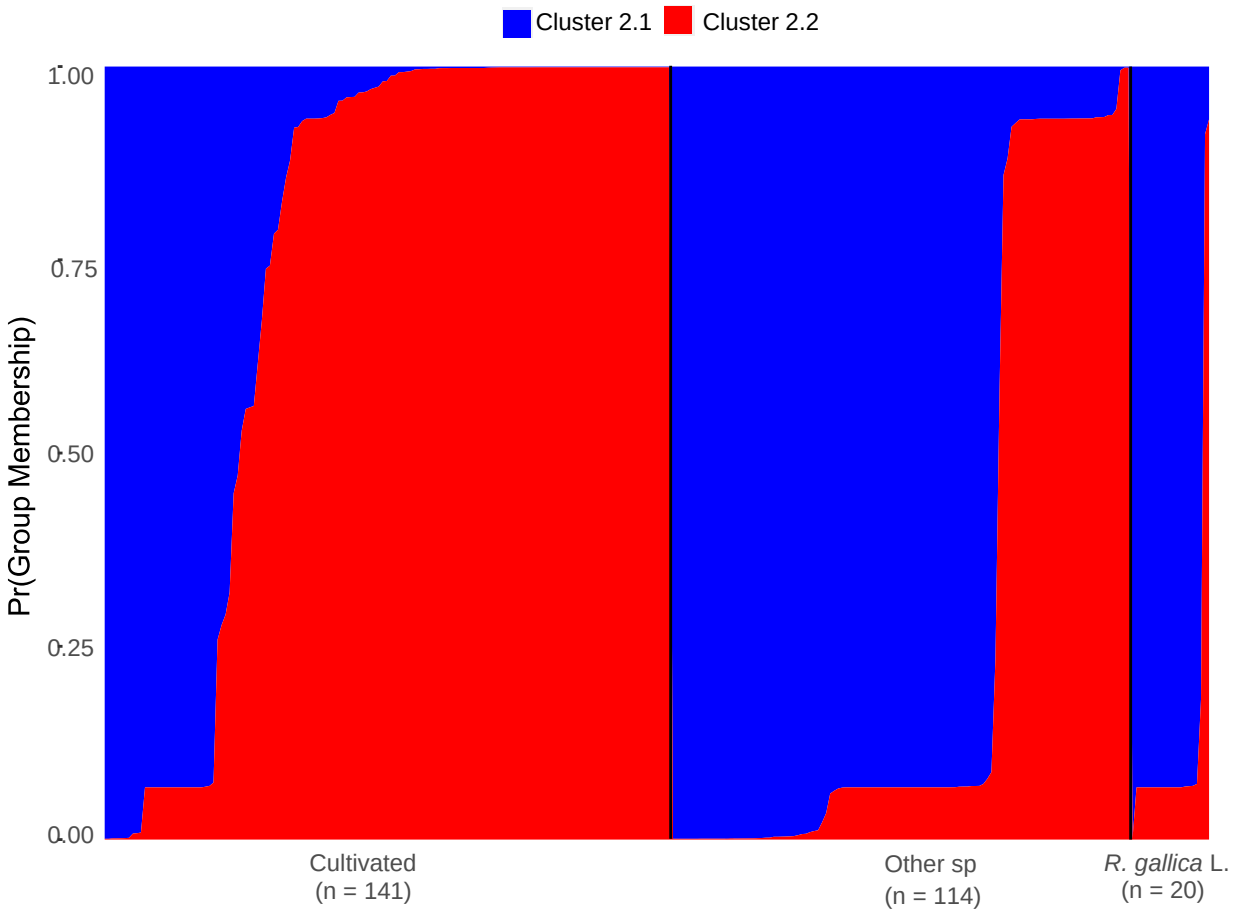

Figure 11. STRUCTURE results on General Cluster 2 subdivision. Two clusters were identified and for visualization purposes the individuals were separated in wild *R. gallica* L (*R. gallica* L.), other wild species (Other Sp.) and the cultivated compartment (Cultivated).

At least two interesting facts General Cluster 2 are revealed with the subdivision of General Cluster 2. First, is the subdivision of the wild *R. gallica* genotypes. Cluster 2.1 contained 18 genotypes, all significantly assigned, from Bosnia (1), Croatia (3), France (5), Germany (1), Poland (3), Slovenia (4), and Spain (1). Cluster 2.2 contained only two genotypes, one from Bosnia and one from Spain. Second, all Bourbon genotypes (23) were significantly assigned to Cluster 2.2, this represents 88.5 % of Bourbon genotypes evaluated in this study. Cluster 2.2 also includes other species such as *R. multiflora*, *R. chinensis,* Old Blush genotypes. The summary of the distribution of the horticultural groups of interest is presented in **Table 13**.

Table 13. Assignation of the horticultural groups of interest to the clusters determined by STRUCTURE Harvester using genotypes in Cluster 2. G = number of genotypes, CA = confidently assigned genotypes, A = Admixed genotypes, and % = percentage of genotypes assigned to the cluster.

	Cluster 2.1				Cluster 2.2			
Horticultural Group	G	CA	A	%	G	CA	A	%
Alba	2	1	1	28.6	5	4	1	71.4
Bourbon	0	0	0	0	23	23	0	23
Centifolia	2	2	0	50	2	1	1	50
Damask	1	0	1	100	0	0	0	0
Hybrid Gallic	8	7	1	42.1	11	9	2	57.9
Moss	1	1	0	11.1	8	8	0	88.9
Portland	1	1	0	20.0	4	4	0	80.0
Overall	15	12	3	22.1	53	49	4	77.9

4.3 Relationship Between Old, Cultivated Groups

The final hypothesis to test was the genetic relationship between the old, cultivated groups. For this purpose, only the cultivated compartment was included for this analysis.

4.3.1 Cultivated population Structure

The STRUCTURE Harvester results identified 3 clusters ($\Delta K = 278.27$) (**Figure 12 & 13**). These clusters will be referred as Cultivated Cluster 1, Cultivated Cluster 2, and Cultivated Cluster 3. Only 288 genotypes were included in the structure analysis (See **Appendix 5** for detailed information of each genotype). Two individuals were not assigned to a cluster (celestial-9-A12 [Alba] and geschwind-s-nordlandrose-9-F11 [Hybrid Setigera]), as they didn't have any membership probability higher than 0.5 to any cluster. The distribution of the horticultural groups within the clusters is shown in **Table 14**.

Table 14. Distribution of the all the horticultural groups in the clusters determined by STRUCTURE Harvester.

Horticultural Group	Cultivated Cluster 1	Cultivated Cluster 2	Cultivated Cluster 3
Alba	3	8	2
Ayrshire	1	0	0
Bourbon	21	5	0
Boursault	1	0	0

Horticultural Group	Cultivated Cluster 1	Cultivated Cluster 2	Cultivated Cluster 3
Centifolia	0	14	2
Damask	0	9	1
China	2	0	0
Hybrid China	0	1	0
Hybrid Eglanteria	0	1	1
Hybrid Foetida	0	0	1
Hybrid Gallica	7	81	8
Hybrid Multiflora	4	2	1
Hybrid Musk	1	0	0
Hybrid Perpetual	3	6	1
Hybrid Rugosa	1	0	0
Hybrid Sempervirens	0	0	2
Hybrid Setigera	1	0	0
Hybrid Spinosissima	0	0	2
Hybrid Tea	5	0	0
Hybrid Wichurana	1	0	0
Moss	5	14	1
Noisette	5	0	0
Polyantha	3	0	0
Portland	2	13	2
Tea	4	0	0
Unknown	7	1	2
Botanical Species	3	5	11
Interspecies	3	4	2
Total	**83**	**164**	**39**

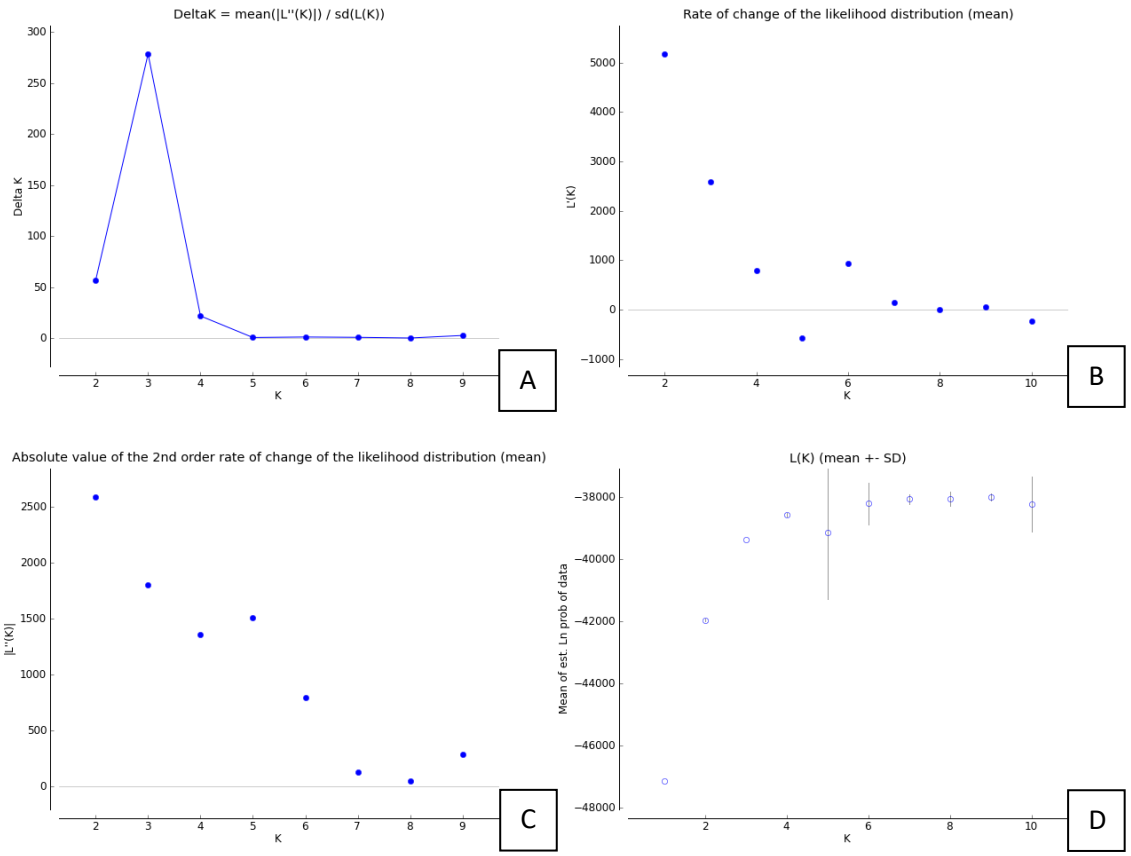

Figure 12. Structure Harvester results for the 288 cultivated genotypes analyzed using SSR-seq markers based on (Earl & vonHoldt, 2012). **A)** ΔK = mean (|L”(K)|)/sd(L(K)) indicating 3 as the maximum value; **B)** rate of change of the likelihood distribution (mean); **C)** absolute value of the 2nd order rate of change of the likelihood distribution (mean) **D)** mean of estimated Ln probability.

The summary specific for the horticultural groups of interest is presented in **Table 15**. Cultivated Cluster 2 grouped most of the genotypes (164), from which 144 (87.8%) were from the horticultural groups of interest. Cultivated Cluster 2 contains more than half of the percentage of every horticultural group of interest (from 61.5 % in Albas to 90.0 % in Damasks), except for Bourbons (19.2%). Cultivated Cluster 1 holds 80.8% of Bourbons, also being the largest group in the cluster with 21 individuals (18 confidently assigned and 3 admixed). Cultivated Cluster 1 also contained 25% of Mosses, 23.1% of Albas, 11.8% of Portlands and 7.3% of Hybrid Gallicas. Interestingly, no Centifolia or Damask genotypes were classified in Cultivated Cluster 1. Cultivated Cluster 3 contained only 39 genotypes, 16 were from the horticultural groups of interest. No Bourbon genotype was classified for cluster 3. Overall, Cultivated Cluster 1 contains mostly genotypes with Asian genetic background, Cluster 2 genotypes with *R. gallica* genetic background and Cluster 3 contains genotypes with no clear genetic background, but with several Botanical Species.

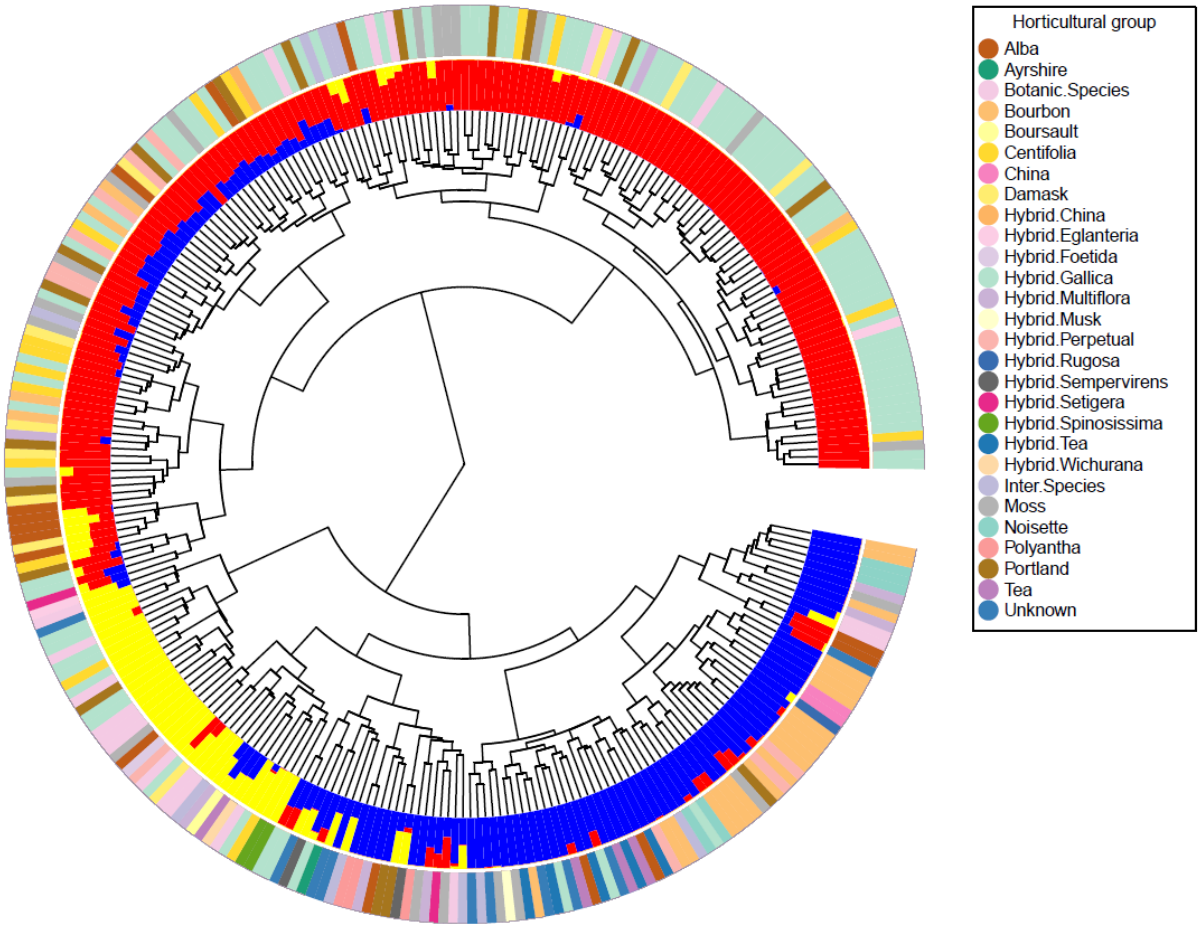

Figure 13. Hierarchical clustering of the cultivated compartments using Chord distances and Ward method, this was only used for representation purposes. The inner ring represents the membership coefficient (Q) of each genotype with the clusters identified by STRUCTURE Harvester: Cultivated Cluster 1 = blue, Cultivated Cluster 2 is red, and Cultivated Cluster 3 is yellow. The outer ring represents the horticultural groups, which are described in the legend.

The AMOVA results determined the Horticultural groups were significantly different ($p<0.001$). The within population variability was 86.8.% and the among population variability was 13.2% based on Rho ($F = 0.132$).

Table 15. Assignation of the horticultural groups of interest based on the STRUCTURE Harvester results considering only the Cultivated compartment. G = number of genotypes in the cluster; CA = Confidently assigned genotypes; A = Admixed genotypes; and % = percentage of genotypes in the cluster.

	Cultivated Cluster 1				Cultivated Cluster 2				Cultivated Cluster 3			
Horticultural Group	**G**	**CA**	**A**	**%**	**G**	**CA**	**A**	**%**	**G**	**CA**	**A**	**%**
Alba	3	3	0	23.1	8	3	5	61.5	2	1	1	15.4

	Cultivated Cluster 1				Cultivated Cluster 2				Cultivated Cluster 3			
Horticultural Group	**G**	**CA**	**A**	**%**	**G**	**CA**	**A**	**%**	**G**	**CA**	**A**	**%**
Bourbon	21	18	3	80.8	5	3	2	19.2	0	0	0	0
Centifolia	0	0	0	0	14	11	3	87.5	2	2	0	12.5
Damask	0	0	0	0	9	6	3	90.0	1	0	1	10.0
Hybrid Gallic	7	3	4	7.3	81	64	17	84.4	8	8	0	8.3
Moss	5	4	1	25.0	14	8	6	70.0	1	1	0	5.0
Portland	2	1	1	11.8	13	7	6	76.5	2	1	1	11.8
Overall	**38**	**29**	**9**	**19.2**	**144**	**102**	**42**	**72.7**	**16**	**13**	**4**	**8.1**

4.3.2 Pairwise Genetic Differentiation

The Rho pairwise differentiation ranged from 0 to 0.280 (**Figure 14**). Hybrid Gallicas showed little differentiation with all groups except Albas (0.107) and Bourbons (0.280). The Bourbon genotypes were the most significantly different group, ranging from 0.110 with Albas to 0.280 with Hybrid Gallicas. No significant differentiation was determined between Portland, Damasks, Centifolias and Moss; and little significant differentiation with Hybrid Gallicas (0.028). Damask and Moss genotypes showed little differentiation with all groups except Bourbons. Mosses show little genetic differentiation with Centifolias (0.012) and Damasks (0.007). Centifolias show little genetic differentiation with all other groups except Bourbon. Albas showed little genetic differentiation with Mosses, Centifolias, Damasks, and Portlands; and moderate genetic differentiation with Hybrid Gallicas and Bourbons.

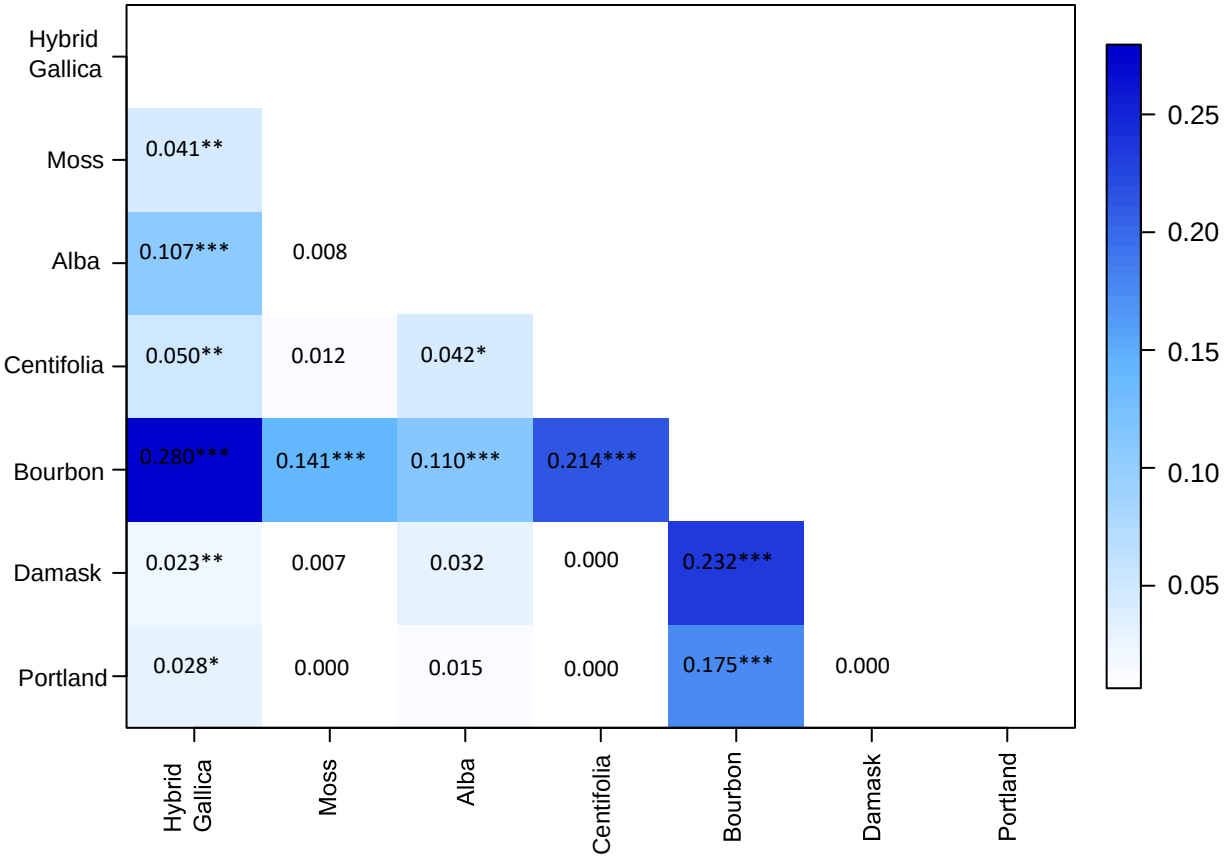

Figure 14. Rho pairwise differentiation among the 199 cultivated genotypes of the horticultural groups of interest based on the 19 SSR-seq. The shading varies from white to dark blue based on the Rho value. The scale was considered as following: 0.0 < Rho < 0.05: little genetic differentiation; 0.05 < Rho < 0.15: moderate genetic differentiation; 0.15< Rho < 0.25: high genetic differentiation; Rho > 0.25: very high genetic differentiation. The p-values are indicated by the * = * < 0.05, ** <0.01, and *** <0.001.

5. Discussion

In this research project, I studied the genetic diversity and population structure and differentiation of roses, focusing on *R. gallica* and seven cultivated groups. The importance of studying *R. gallica* germplasm relies on the fact that it is one of the foundation species of most garden roses (Hurst, 1941) and century-old garden rose germplasm is still available due to vegetative propagation, making it ideal for breeding studies (Liorzou et al., 2016). Diversity studies on roses provide valuable information on the genetic background of cultivated roses, and for germplasm identification and conservation.

5.1 Data Exploration

Two relevant facts of this study are the use of SSR-seq markers, which enhances allele determination, and the use of bioinformatic tools for allele dosage determination. To my knowledge, all previous studies using SSR in roses were done using capillary electrophoresis and/or presence/absence data

(i.e. Liorzou et al., 2016; Tan et al., 2017; Vukosavljev et al., 2013). This research project represents the first development of SSR-seq markers roses. For next generation sequencing approaches, the research questions and the budget needs to be considered (Flanagan & Jones, 2019). For example, one of the objectives of the project is to perform a parentage analysis, and SSR markers are recommended if already available and if they provide the desired resolution (Flanagan & Jones, 2019). In this study, SSR-seq markers were highly polymorphic, with loci ranging from 30 to 142 alleles. As compared to SSR-ce, SSR-seq tend to be cheaper when the number of individuals and markers increase (Darby et al., 2016). This genotyping process allowed to genotype up to 380 individuals using 60 markers at a price of less than 10 euros per individual (Pawula pers. com.).

The approach I used to evaluate null alleles based on the inbreeding coefficient as in Lepais et al. (2022) didn't work as desired. As explained before, due to the sampling process, and the reproduction and arrangement of *R. gallica* in the wild, locations could not be used as populations to assess the inbreeding coefficient. Using the genetic clusters as populations might not be the best solution in this case, and other grouping process is required. As expressed by Jahnke et al. (2022), the removal of loci with null alleles is only recommended when it doesn't lead to massive data loss, therefore, I decided not to remove any loci, as probably the analysis wasn't effective.

5.2 Relationship Between the Wild R. gallica and Cultivated Compartments

In the structure analysis, wild *R. gallica* genotypes were divided into the two clusters. General Cluster 1 contained 400 genotypes from 14 countries, and General Cluster 2 only 20 genotypes from 7 countries. As mentioned before, my supervisor had been suspicious about the correct identification of several *R. gallica* individuals, as they didn't perfectly match the description of *R. gallica*. I hypothesize that these genotypes were either misidentified as *R. gallica* or are hybrids of *R. gallica*, however the status of natural hybrids in the wild is unknown (Wissemann, 2017).

The genetic relationship between wild *R. gallica* and the horticultural group of interest is suggested by the General Cluster 1. Hybrid Gallicas are the horticultural group showing a greater clustering with wild *R. gallica* genotypes, as 61.9 % (60) of Hybrid Gallica genotypes were significantly assigned to the General Cluster 1. Most of Portland, Centifolia, and Moss genotypes were classified as admixed, however they had significantly assigned genotypes in both General Clusters. Damasks genotypes of were either confidently assigned to General Cluster 1 (20 %) or considered as admixed genotypes (80%). Contrarily, Alba genotypes were either confidently assigned to General Cluster 2 (28.6 %) or considered admixed (71.4 %). Most Bourbon genotypes were confidently assigned to General Cluster 2 (76.9 %), the rest were either admixed (19.2 %) or confidently assigned to General Cluster 1 (3.9 %).

The admixture of the horticultural groups of interest suggests that they have a mixed genetic background between the 2 General Clusters.

Based on the STRUCTURE results, I can say that there is an influence of wild *R. gallica* in the horticultural groups of interest. These two General Clusters do not separate these horticultural groups clearly, as all groups have genotypes in both General Clusters. However, the influence of wild *R. gallica* in Bourbons seems to be minimum, compared to the other horticultural groups of interest.

Historically, Hybrid Gallicas were mostly bred during the beginning of the 19th century by French breeders (Gardès et al., 2005). The subdivision of General Cluster 1 provides genetic evidence of this historical event. Cluster 1.2 only includes confidently assigned French *R. gallica* genotypes (94). Most Hybrid Gallica genotypes (92.8 %) were also confidently assigned to Cluster 1.2. Furthermore, the fact that 95.5% of the genotypes from the horticultural groups of interest clustered with mostly French *R. gallica* genotypes reveals the strong genetic relationship between these two groups.

5.3 Relationship Between Old, Cultivated Groups

Based on the analysis performed and the results obtained, I can give an insight on the relationship of the old, cultivated groups, and comment these relationships together with the breeding history of each group.

Both the population structure and pairwise differentiation analysis agree in the fact that Bourbon is the most genetically differentiated group from the horticultural groups of interested. Indeed, Cultivated Cluster 1 didn't include any Centifolia or Damask genotype, and these groups had high genetic differentiation (0.214 and 0.232) with Bourbons. Vukosavljev et al. (2013) mentions that Damasks are possible parents of Bourbons, however, the results presented in this study suggest these groups are not closely related. Cultivated Cluster 1 also included 25% of Mosses and 23.1% of Albas, which show moderate genetic differentiation (0.141 and 0.110) with Bourbons. Finally, Cultivated Cluster 1 included 11.8% of Portlands and and 7.3% of Hybrid Gallicas, which showed high (0.175) to very high (0.280) genetic differentiation with Bourbons. Cultivated Cluster 1 holds most old Asian garden roses and is exclusive to groups with known Asian genetic background including China, Tea, Tea Hybrids, and Noisettes. This suggests that Bourbon genotypes have a strong influence from Asian background.

According to literature, the breeding process of Portlands involve Gallicas, Damasks, Centifolias and/or Hybrid Chinas (Scariot et al., 2006; Vukosavljev et al., 2013). Portland showed no genetic differentiation with Damasks and Centifolia, and little genetic differentiation with Hybrid Gallicas 0.028. Additionally, most of the genotypes from these groups clustered in Cultivated Cluster 2. These results support the idea that these groups are involved in the origins of Portlands. The only Hybrid

China genotype was an admixed genotype of Cultivated Cluster 2, with 0.71 MP. More Hybrid Chinas are required for data analysis and more precise conclusions, as this single individual is not enough.

Breeding process of Mosses hypothesize they derive from Centifolias (Hurst, 1941; Scariot et al., 2006; Vukosavljev et al., 2013) and/or are linked to Damasks (Scariot et al., 2006). Mosses show little genetic differentiation with Centifolias (0.012) and Damasks (0.007). Both the General Clusters and the Cultivated Clusters, evidence that Moss genotypes vary in their clustering, and don't seem to have a clear genetic background. As explained by Liorzou et al. (2016), Moss individuals might be classified only based on the mossy phenotypic trait, and this trait might have been introduced in different genetic backgrounds.

Using internal transcribed spacers (ITS1/ITS2), W.-H. Cui et al. (2022) determined that *R. damascena* derived from *R. moschata* as potential ovule donor, and as potential pollen donors they mention *R. gallica* and *R. fedtschenkoana*, and also *R. majalis* and *R. davurica* as they share a copy of ITS1 (VII) and ITS2 (VII-2) with *R. fedtschenkoana*. My results can't confirm the origins of Damasks, however they can give evidence of the genetic relationships of Damasks with their possible ancestors. The only genotype of *R. phoenicea* was confidently assigned to General Cluster 1 together with most of the wild *R. gallica*, and *R. moschata* (3), R. majalis (4), *R. fedtschenkoana* (1), and *R. davurica* (1) genotypes. Damasks genotypes were mostly admixed (8), and only two were confidently assigned to General Cluster 1. The *R. damascena* genotype included in the Other sp category was also admixed. This suggests Damasks roses have genetic background from genotypes from both General Clusters.

Atienza et al. (2005) found a close relationship between the section *Caninae* and *R. alba* groups, with *R. gallica* group being the closest to both. This finding support the idea of the hybrid origin of *R. alba*, with *R. canina* and *R. gallica* as parents. Atienza et al. (2005) explain that the closer relationship between *R. alba* and *R. canina* might be explained by the hexaploid state of *R. alba*, probably receiving five genomes of *R. canina* and one of *R. gallica*. In the section 4.2.1 "General Population Structure" results, genotypes from the *Caninae* section (i.e. *R. canina*, *R. agrestis*, *R. glauca*, *R. rubiginosa*) section were confidently assigned to General Cluster 2. Cultivated Albas (14) were mostly admixed (10) or confidently assigned (4) to Cluster 2. Additionaly, the *R. alba* (2) genotypes in the Other sp. category were also admixed individuals. No Alba genotype was confidently assigned to Genral Cluster 1, which contains most of the wild *R. gallica* genotypes. This suggests Alba genotypes to have genetic background from both clusters, but a greater influence from General Cluster 2.

Pairwise differentiation suggest Centifolias have a little genetic differentiation with all horticultural groups of interest, except Bourbons; and that they are more closely related to Damasks and Portlands.

The breeding hypotheses of Centifolias are complex (see Table 2), and my results cannot provide a clear evidence to support any of them.

The pairwise genetic distance determined that Hybrid Gallicas show little genetic distance with Damasks (0.023), Portlands (0.028), Mosses (0.041), Centifolia (0.050); moderate genetic differentiation with Albas (0.107); very high genetic relationship with Bourbons (0.280). The cultivated population results gave a similar idea. Hybrid Gallicas were mostly grouped in Cultivated Cluster 2, with most of the horticultural groups of interest, except Bourbons (19.2 %). This reinforce the idea that these horticultural groups have a common genetic background, and that I cannot discard that Hybrid Gallicas could have been used during the breeding process of other groups. Other than the strong genetic relationship between Hybrid Gallicas and wild *R. gallica*, my results cannot suggest any other species as possible parent of this group.

6. Conclusions and Perspectives

6.1 Conclusions

- The genetic relationships between wild *R. gallica* and the horticultural groups of interest were confirmed, although the relationship varies with each horticultural group. Bourbon genotypes were the least related to wild *R. gallica* and are suggested to have a strong Asian background. The rest of the horticultural groups of interest seem to share a common related background linked to wild. *R. gallica*.
- Based on the populations structure results, French wild *R. gallica* genotypes are closely linked to a considerable number of genotypes of the horticultural groups of interest. This suggests French *R. gallica* genotypes were used during their breeding process or are related to genotypes bred using French genetic background.
- The horticultural classification was not supported by genetic evidence, suggesting this classification lacks genetic bases. The only trend that seemed evident was the higher genetic differentiation between Bourbon genotypes and the rest of the horticultural groups of interest, and the closer relationship of Bourbons to other Asian cultivars.
- No specific evidence is provided about the specific parents of the horticultural groups of interest, but some hypotheses were supported by my results.
- In terms of germplasm conservation purpose, the elevated number of clones identified, both in wild and cultivated genotypes, evidence the need of genetic studies for an efficient conservation of genetic diversity in *Rosa* species and cultivars. Also, the suspicions on the

misidentification of some wild *R. gallica* genotypes based on morphological characteristics was confirmed with genetic evidence.

6.2 Perspectives

- For this specific study, all the genotypes were considered as tetraploids to ease the analysis of the data and because the ploidy of multiple genotypes was unknown. Ideally, the ploidy of the genotypes could be determined and then, the bioinformatic analysis be adapted to the specific ploidy of the individual.
- I didn't manage to detail all the information concerning the detection of clones. It would be interesting to further study the genotypes considered as clones and identify if this detection was within the groups (i.e. wild species - wild species) or between groups (i.e. wild species – cultivated).
- I couldn't use the inbreeding coefficient (Gis) to effectively filter the markers based on null alleles. A more detailed analysis using different population classification could provide a better insight into the null alleles based on the inbreeding coefficient. Alternatively, other approaches can be used.
- The initial idea to provide a better insight for the breeding history of the horticultural groups of interest was to perform a parentage analysis. Also, hierarchical clustering and private alleles were other strategies in mind, but I didn't have time to perform all these analyses.

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8. Appendix

Appendix 1. List of genotypes eliminated by clone correction.

Category	Individual Name	ID individual	Species	Population Code	Country	Horticultural Group
Cultivated	anatole-9-A3	anatole	-	-	-	HGal
Cultivated	asepala-16-C1	asepala	-	-	-	M
Cultivated	belle-biblis-12-C11	belle-biblis	-	-	-	HGal
Cultivated	belle-flore-7-F8	belle-flore	-	-	-	HGal
Cultivated	belle-pourpre-violette-10-C3	belle-pourpre-violette	-	-	-	HGal
Cultivated	bellevirginie-T2	belle-virginie	-	-	-	HGal
Cultivated	bellevirginie-T3	belle-virginie	-	-	-	HGal
Cultivated	belvedere-9-E6	belvedere	-	-	-	HSem
Cultivated	bizarre-triomphant-14-C11	bizarre-triomphant	-	-	-	HGal
Cultivated	blanche-a-fleurs-pleines-10-G3	blanche-a-fleurs-pleines	-	-	-	HSem
Cultivated	bouquet-charmant-15-B7	bouquet-charmant	-	-	-	HGal
Cultivated	cabbage-rose-16-F9	cabbage-rose	-	-	-	C
Cultivated	cardinal-de-richelieu-14-D11	cardinal-de-richelieu	-	-	-	HGal
Cultivated	caroline-de-berry-7-B11	caroline-de-berry	-	-	-	M
Cultivated	celina-dubos-10-E2	celina-dubos	-	-	-	D
Cultivated	cent-feuilles-descemet-16-G9	cent-feuilles-descemet	-	-	-	C
Cultivated	chapeau-de-napoleon-7-H9	chapeau-de-napoleon	-	-	-	C
Cultivated	common-moss-16-D5	common-moss	-	-	-	M
Cultivated	cramoisi-eblouissant-8-A8	cramoisi-eblouissant	-	-	-	HGal
Cultivated	cuisse-de-nymphe-14-H10	cuisse-de-nymphe	-	-	-	A
Cultivated	deuil-du-dr-raynaud-8-A2	deuil-du-dr-raynaud	-	-	-	B
Cultivated	di-abelc	mme-abel-chatenay	-	-	-	HT
Cultivated	di-coron	coronet-Florhige-8R	-	-	-	HT
Cultivated	di-mvaum	multiflore-de-vaumarcus	-	-	-	N
Cultivated	di-parky	Park-yellow-tea-scented	-	-	-	Unknown
Cultivated	di-singl	single-pink-china	-	-	-	Ch
Cultivated	di-thefa	The-fairy	-	-	-	Pol
Cultivated	di-trann	tran-nu-guang	-	-	-	Unknown
Cultivated	docteur-leprestre-7-E11	docteur-leprestre	-	-	-	B
Cultivated	duc-de-bordeaux-8-G3	duc-de-bordeaux	-	-	-	HGal
Cultivated	duc-de-brabant-16-D3	duc-de-brabant	-	-	-	C
Cultivated	duchesse-d-istrie-16-E1	duchesse-d-istrie	-	-	-	M
Cultivated	enfant-de-france-9-H11	enfant-de-france	-	-	-	HP
Cultivated	eucharis-16-A8	eucharis	-	-	-	HGal
Cultivated	fanny-pavetot-7-D11	fanny-pavetot	-	-	-	HGal
Cultivated	feu-amoureux-8-D1	feu-amoureux	-	-	-	HGal
Cultivated	fleur-de-pelletier-9-F1	fleur-de-pelletier	-	-	-	HGal
Cultivated	garibaldi-8-B5	garibaldi	-	-	-	B
Cultivated	general-drouot-15-E12	general-drouot	-	-	-	M
Cultivated	georges-cuvier-7-G11	georges-cuvier	-	-	-	B
Cultivated	gloire-de-france-8-B11	gloire-de-france	-	-	-	HGal
Cultivated	gracilis-8-H2	gracilis	-	-	-	A

Category	Individual Name	ID individual	Species	Population Code	Country	Horticultural Group
Cultivated	grand-corneille-8-F2	grand-corneille	-	-	-	HGal
Cultivated	grande-et-belle-7-E10	grande-et-belle	-	-	-	HGal
Cultivated	haddington-15-B3	haddington	-	-	-	HGal
Cultivated	hap-hob	HapOB-03	-	-	-	Unknown
Cultivated	henriette-15-F7	henriette	-	-	-	HGal
Cultivated	henri-foucquier-15-E8	henri-foucquier	-	-	-	HGal
Cultivated	ispahan-15-F10	ispahan	-	-	-	D
Cultivated	juliette-10-B1	juliette	-	-	-	HGal
Cultivated	kazanlik-9-G11	kazanlik	-	-	-	D
Cultivated	kean-16-B11	kean	-	-	-	HGal
Cultivated	la-gloire-des-jardins-7-E9	la-gloire-des-jardins	-	-	-	HGal
Cultivated	la-pucelle-10-G1	la-pucelle	-	-	-	HGal
Cultivated	la-revenante-9-F2	la-revenante	-	-	-	HGal
Cultivated	l-enchanteresse-8-C6	l-enchanteresse	-	-	-	HGal
Cultivated	l-eveque-16-H9	l-eveque	-	-	-	HGal
Cultivated	louise-odier-15-A11	louise-odier	-	-	-	B
Cultivated	louis-philippe-8-F10	louis-philippe	-	-	-	HGal
Cultivated	magna-charta-15-B2	magna-charta	-	-	-	HP
Cultivated	majestueuse-9-H9	majestueuse	-	-	-	HGal
Cultivated	malesherbes-9-H3	malesherbes	-	-	-	HGal
Cultivated	manteau-pourpre-15-G2	manteau-pourpre	-	-	-	HGal
Cultivated	marie-henriette-9-D6	marie-henriette	-	-	-	HMult
Cultivated	menage-16-G12	menage	-	-	-	A
Cultivated	mle-josephine-guyot-16-C8	mle-josephine-guyot	-	-	-	B
Cultivated	mme-plantier-8-E4	mme-plantier	-	-	-	A
Cultivated	mme-zoetmans-15-D5	mme-zoetmans	-	-	-	D
Cultivated	mousseuse-blanche-nouvelle-16-H3	mousseuse-blanche-nouvelle	-	-	-	M
Cultivated	mousseux-ancien-8-F4	mousseux-ancien	-	-	-	M
Cultivated	mr-pelisson-15-D4	mr-pelisson	-	-	-	M
Cultivated	narcisse-de-salvandy-15-B11	narcisse-de-salvandy	-	-	-	HGal
Cultivated	nouvelle-pivoine-7-H8	nouvelle-pivoine	-	-	-	HGal
Cultivated	octavie-8-B3	octavie	-	-	-	HGal
Cultivated	oeillet-16-A4	oeillet	-	-	-	HGal
Cultivated	oeillet-de-damas-14-G12	oeillet-de-damas	-	-	-	D
Cultivated	oeillet-parfait-16-H6	oeillet-parfait	-	-	-	HGal
Cultivated	old-red-moss-8-E6	old-red-moss	-	-	-	M
Cultivated	ombree-parfaite-9-A1	ombree-parfaite	-	-	-	HGal
Cultivated	orpheline-de-juillet-8-E3	orpheline-de-juillet	-	-	-	HGal
Cultivated	panachee-superbe-9-G9	panachee-superbe	-	-	-	HGal
Cultivated	park-yellow-tea-scented-china-15-A3	park-yellow-tea-scented-china	-	-	-	T
Cultivated	pauline-bonaparte-15-C11	pauline-bonaparte	-	-	-	B
Cultivated	paul-ricault-8-H3	paul-ricault	-	-	-	C
Cultivated	persian-yellow-9-H4	persian-yellow	-	-	-	Sp
Cultivated	petite-de-hollande-8-C12	petite-de-hollande	-	-	-	C
Cultivated	pink-leda-8-H10	pink-leda	-	-	-	D

Category	Individual Name	ID individual	Species	Population Code	Country	Horticultural Group
Cultivated	pompon-de-bourgogne-8-D4	pompon-de-bourgogne	-	-	-	HGal
Cultivated	ponctuee-16-A7	ponctuee	-	-	-	M
Cultivated	porte-greffe-de-arthur-young-8-H5	porte-greffe-de-arthur-young	-	-	-	Sp
Cultivated	porte-greffe-de-rosa-complicata-8-H8	porte-greffe-de-rosa-complicata	-	-	-	Sp
Cultivated	pourpre-ardoise-15-D8	pourpre-ardoise	-	-	-	HGal
Cultivated	precoce-7-C11	precoce	-	-	-	M
Cultivated	president-de-seze-8-G4	president-de-seze	-	-	-	HGal
Cultivated	president-gausen-16-E8	president-gausen	-	-	-	B
Cultivated	prince-charles-15-D11	prince-charles	-	-	-	B
Cultivated	princesse-amelie-7-F10	princesse-amelie	-	-	-	M
Cultivated	princesse-de-lamballe-14-A12	princesse-de-lamballe	-	-	-	A
Cultivated	provence-pink-14-H11	provence-pink	-	-	-	C
Cultivated	provins-ancien-16-B7	provins-ancien	-	-	-	HGal
Cultivated	provins-velours-8-D3	provins-velours	-	-	-	HGal
Cultivated	pucelle-de-lille-15-H8	pucelle-de-lille	-	-	-	HGal
Cultivated	quatre-saisons-blanc-mousseux-15-B1	quatre-saisons-blanc-mousseux	-	-	-	M
Cultivated	quatre-saisons-blanc-mousseux-16-A2	quatre-saisons-blanc-mousseux	-	-	-	M
Cultivated	reine-de-saxe-8-A5	reine-de-saxe	-	-	-	C
Cultivated	reine-d-espagne-7-D12	reine-d-espagne	-	-	-	HP
Cultivated	roi-des-pourpres-15-F11	roi-des-pourpres	-	-	-	HGal
Cultivated	rosa-borboniana-16-E11	rosa-x-borboniana	-	-	-	B
Cultivated	rosa-bullata-8-G8	rosa-bullata	-	-	-	C
Cultivated	rosa-centifolia-15-A6	rosa-centifolia	-	-	-	C
Cultivated	rosa-centifolia-15-F12	rosa-centifolia	-	-	-	C
Cultivated	rosa-centifolia-8-E11	rosa-centifolia	-	-	-	C
Cultivated	rosa-centifolia-muscosa-7-D10	rosa-centifolia-muscosa	-	-	-	M
Cultivated	rosa-centifolia-mutabilis-8-A3	rosa-centifolia-mutabilis	-	-	-	C
Cultivated	rosa-centifolia-pomponia-16-F2	rosa-x-centifolia-pomponia	-	-	-	C
Cultivated	rosa-centifolia-simplex-16-B2	rosa-centifolia-simplex	-	-	-	C
Cultivated	rosa-centifolia-white-moss-8-B9	rosa-centifolia-white-moss	-	-	-	M
Cultivated	rosa-chinensis-viridiflora-16-D12	rosa-chinensis-viridiflora	-	-	-	Ch
Cultivated	rosa-damascena-15-D7	rosa-damascena	-	-	-	D
Cultivated	rosa-damascena-15-G6	rosa-x-damascena	-	-	-	D
Cultivated	rosa-damascena-15-H6	rosa-x-damascena	-	-	-	D
Cultivated	rosa-damascena-celsiana-8-C11	rosa-damascena-celsiana	-	-	-	D
Cultivated	rosa-damascena-quatre-saisons-13-D5	rosa-damascena-quatre-saisons	-	-	-	D
Cultivated	rosa-damascena-semperflorens-8-B6	rosa-damascena-semperflorens	-	-	-	D
Cultivated	rosa-damascena-versicolor-16-B10	rosa-damascena-versicolor	-	-	-	D
Cultivated	rosa-foetida-bicolor-8-G9	rosa-foetida-bicolor	-	-	-	Sp
Cultivated	rosa-gallica-agatha-9-A4	rosa-gallica-agatha	-	-	-	HGal
Cultivated	rosa-gallica-lycoris-15-D6	rosa-gallica-lycoris	-	-	-	HGal
Cultivated	rosa-gallica-officinalis-15-G11	rosa-gallica-officinalis	-	-	-	Sp
Cultivated	rosa-gallica-officinalis-8-B4	rosa-gallica-officinalis	-	-	-	Sp
Cultivated	rosa-gallica-officinalis-9-F12	rosa-gallica-officinalis	-	-	-	Sp
Cultivated	rosa-gallica-splendens-8-A12	rosa-gallica-splendens	-	-	-	HGal

Category	Individual Name	ID individual	Species	Population Code	Country	Horticultural Group
Cultivated	rosa-gallica-versicolor-8-D9	rosa-gallica-versicolor	-	-	-	Sp
Cultivated	rosa-gallica-walonic-11-A2	rosa-gallica-walonic	-	-	-	HGal
Cultivated	rosa-macrantha-waitziana-8-B10	rosa-macrantha-waitziana	-	-	-	HGal
Cultivated	rosa-odorata-ochroleuca-16-B9	rosa-X-odorata-ochroleuca	-	-	-	T
Cultivated	rosa-polliniana-7-E8	rosa-polliniana	-	-	-	intersp
Cultivated	rosa-richardii-8-D11	rosa-richardii	-	-	-	S
Cultivated	rosa-sancta-8-H11	rosa-sancta	-	-	-	intersp
Cultivated	rosa-slater-s-crimson-china-9-G8	rosa-slater-s-crimson-china	-	-	-	Ch
Cultivated	rosa-violacea-7-B9	rosa-violacea	-	-	-	HGal
Cultivated	rose-chou-9-C12	rose-chou	-	-	-	C
Cultivated	rose-de-meaux-blanc-14-B11	rose-de-meaux-blanc	-	-	-	C
Cultivated	rose-de-puteaux-16-F11	rose-de-puteaux	-	-	-	D
Cultivated	rose-de-schelfhout-8-G10	rose-de-schelfhout	-	-	-	HGal
Cultivated	rose-foucheaux-16-F7	rose-foucheaux	-	-	-	HGal
Cultivated	rosier-d-amour-9-G12	rosier-d-amour	-	-	-	HGal
Cultivated	rosier-des-parfumeurs-8-F3	rosier-des-parfumeurs	-	-	-	HGal
Cultivated	rosier-eveque-15-G4	rosier-eveque	-	-	-	HGal
Cultivated	Rw-14-G9	Rw	-	-	-	Sp
Cultivated	sans-petales-16-G11	sans-petales	-	-	-	C
Cultivated	shailer-s-white-moss-16-C2	shailer-s-white-moss	-	-	-	M
Cultivated	skibenes-9-B8	skibenes	-	-	-	HGal
Cultivated	souv-de-la-malmaison-15-D1	souv-de-la-malmaison	-	-	-	B
Cultivated	souvenir-de-louis-gaudin-7-G10	souvenir-de-louis-gaudin	-	-	-	B
Cultivated	tetra-black	Black-baccara	-	-	-	HT
Cultivated	tetra-cabba	cabbage-rose	-	-	-	Unknown
Cultivated	tetra-cabba	cabbage-rose	-	-	-	Unknown
Cultivated	tetra-conra	conrad-ferdinand-meyer	-	-	-	Hrug
Cultivated	tetra-inabi	ina-bingham	-	-	-	HP
Cultivated	tetra-janet	janet-s-pride	-	-	-	Heg
Cultivated	tetra-lerir	le-rire-niais	-	-	-	C
Cultivated	tetra-lerir	le-rire-niais	-	-	-	C
Cultivated	tetra-meivh	meivhienna	-	-	-	Unknown
Cultivated	tetra-nilbl	Nil-bleu	-	-	-	Unknown
Cultivated	tetra-oeill	<9c>illet-de-damas	-	-	-	D
Cultivated	tetra-pault	paul-transon	-	-	-	HRug
Cultivated	tetra-persian	persian-yellow	-	-	-	Sp
Cultivated	tetra-persian	persian-yellow	-	-	-	Sp
Cultivated	tetra-rfed	rosa-fedschenkoana	-	-	-	Sp
Cultivated	tetra-robus	Robusta-Bourbon	-	-	-	B
Cultivated	tetra-sonia	Sonia	-	-	-	Unknown
Cultivated	tetra-tiffa	Tiffany-Blue	-	-	-	Unknown
Cultivated	tetra-virgi	La-virginiale	-	-	-	HGal
Cultivated	tri-littl	Little-White-Pet	-	-	-	Unknown
Cultivated	triomphe-de-flore-9-E5	triomphe-de-flore	-	-	-	HGal
Cultivated	triomphe-de-sterckmans-8-B8	triomphe-de-sterckmans	-	-	-	HGal

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Cultivated	tuscany-9-G1	tuscany	-	-	-	HGal
Cultivated	tuscany-superb-9-E9	tuscany-superb	-	-	-	HGal
Cultivated	velours-noir-10-F1	velours-noir	-	-	-	HGal
Cultivated	velours-pourpre-8-D2	velours-pourpre	-	-	-	HGal
Cultivated	vicomte-fritz-de-cussy-7-F12	vicomte-fritz-de-cussy	-	-	-	B
Cultivated	vierge-de-clery-16-A12	vierge-de-clery	-	-	-	C
Cultivated	ville-de-toulouse-7-A12	ville-de-toulouse	-	-	-	HGal
Cultivated	violacee-16-D2	violacee	-	-	-	M
Cultivated	virago-9-F10	virago	-	-	-	HSet
Cultivated	york-and-lancaster-8-A4	york-and-lancaster	-	-	-	D
Other sp.	1-mic-HON-2	1-HON-SAC-2	Rosa micrantha Borr. ex. Sm. sensu stricto	-	-	-
Other sp.	2-gla-SLO-3	2-Rosa-glauca-SLO-3-G06	Rosa glauca Pourr.	-	-	-
Other sp.	8-abi-CZE-1	8-CZE-1-HERBIER-1	Rosa abietina Gren. Ex H. Christ	-	-	-
Other sp.	cent-1	Rosa-centifolia-SAC-1	Rosa centifolia	-	-	-
Other sp.	CEX-02	Collection-PHYROSE-SAC-CEX-02	Rosa x centifolia L.	-	-	-
Other sp.	dama-1	Rosa-damascena-SAC-1	Rosa x damascena Herrm.	-	-	-
Other sp.	di-coule	COULEE-COULEE	Rosa multiflora	-	-	-
Other sp.	di-guyon	GUYON	Rosa multiflora	-	-	-
Other sp.	di-hwic	Hybrid-wichurana	H de Rosa wichurana	-	-	-
Other sp.	di-oriot	ORIOT-KLUST-NORMAL	Rosa multiflora	-	-	-
Other sp.	di-ow9001-pf-ob-hwic	Ow9001	Descendance OW	-	-	-
Other sp.	di-ow9004-pf-ob-hwic	Ow9004	Descendance OW	-	-	-
Other sp.	di-ow9005-pf-ob-hwic	Ow9005	Descendance OW	-	-	-
Other sp.	di-ow9006-pf-ob-hwic	Ow9006	Descendance OW	-	-	-
Other sp.	di-ow9007-pf-ob-hwic	Ow9007	Descendance OW	-	-	-
Other sp.	di-ow9008-pf-ob-hwic	Ow9008	Descendance OW	-	-	-
Other sp.	di-ow9010-pf-ob-hwic	Ow9010	Descendance OW	-	-	-
Other sp.	di-ow9011-pf-ob-hwic	Ow9011	Descendance OW	-	-	-
Other sp.	di-ow9012-pf-ob-hwic	Ow9012	Descendance OW	-	-	-
Other sp.	di-ow9034-pf-ob-hwic	Ow9034	Descendance OW	-	-	-
Other sp.	di-pelle	PELLERIN-EXPLOIT	Rosa multiflora	-	-	-
Other sp.	di-pgabe	PGA-BEAUCOUZE	Rosa multiflora	-	-	-
Other sp.	di-rarv	Rosa-arvensis	Rosa arvensis	-	-	-
Other sp.	di-rcar	Rosa-carolina	Rosa carolina	-	-	-
Other sp.	di-rchi	B00H6DE	Rosa chinensis spontanea	-	-	-
Other sp.	di-rfor	FOR01	Rosa forrestiana	-	-	-
Other sp.	di-rglo	GLO01	Rosa glomerata	-	-	-
Other sp.	di-rgym	GYM01	Rosa gymnocarpa	-	-	-
Other sp.	di-rlae	LAE04	Rosa laevigata	-	-	-
Other sp.	di-rmaj	MAJ03	Rosa majalis	-	-	-
Other sp.	di-rmos	rosa-moschata	Rosa moschata	-	-	-
Other sp.	di-rodo	rosa-var-odorata-gigantea	Rosa var odorata gigantea	-	-	-
Other sp.	di-rper	PER03	Rosa persica	-	-	-
Other sp.	di-rrox	ROX03	Rosa roxburghii	-	-	-
Other sp.	di-rrug	rosa-rugosa	Rosa rugosa	-	-	-

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Other sp.	di-rseg	SET01	Rosa setigera	-	-	-
Other sp.	di-rwic	WIC04	Rosa wichurana	-	-	-
Other sp.	di-rxan	XAN05	Rosa xanthina	-	-	-
Other sp.	FOE-03	Collection-PHYROSE-SAC-FOE-03	Rosa foetida Herrm.	-	-	-
Other sp.	hexa-ralb	ALX01	Rosa alba	-	-	-
Other sp.	LES-01	Collection-PHYROSE-SAC-LES-01	Rosa leschenaultiana Wight & Arnott	-	-	-
Other sp.	LUC-02	Collection-PHYROSE-SAC-LUC-02	Rosa luciae var. fujisanensis Makino	-	-	-
Other sp.	oldblush-T1	Temoin diplo	Old-blush	-	France	-
Other sp.	oldblush-T2	Temoin diplo	Old-blush	-	France	-
Other sp.	oldblush-T3	Temoin diplo	Old-blush	-	France	-
Other sp.	oldblush-T4	Temoin diplo	Old-blush	-	France	-
Other sp.	penta-rdum	DUM01	Rosa dumalis	-	-	-
Other sp.	tetra-ow9001-ow9007	Ow9001 + Ow9007	Tetrasynthetique	-	-	-
Other sp.	tetra-rgal-offic	rosa-gallica-officinalis	Rosa gallica officinalis	-	-	-
Other sp.	tetra-rgal-offic	rosa-gallica-officinalis	Rosa gallica officinalis	-	-	-
Other sp.	tetra-rmac	rosa-macrophylla	Rosa macrophylla	-	-	-
R. gallica L.	Sgal-10-AUT-3	10-AUT-1-SAC-3	Rosa gallica L.	10-AUT	Austria	-
R. gallica L.	Sgal-10-AUT-4	10-AUT-1-SAC-4	Rosa gallica L.	10-AUT	Austria	-
R. gallica L.	Sgal-10-POL-1	10-POL-1-SAC-1	Rosa gallica L.	10-POL	Poland	-
R. gallica L.	Sgal-10-POL-2	10-POL-1-SAC-2	Rosa gallica L.	10-POL	Poland	-
R. gallica L.	Sgal-10-POL-4	10-POL-1-SAC-4	Rosa gallica L.	10-POL	Poland	-
R. gallica L.	Sgal-11-CRO-2	11-CRO-1-SAC-2	Rosa gallica L.	11-CRO	Croatia	-
R. gallica L.	Sgal-11-POL-3	11-POL-1-SAC-3	Rosa gallica L.	11-POL	Poland	-
R. gallica L.	Sgal-12-AUT-3	12-AUT-1-SAC-3	Rosa gallica L.	12-AUT	Austria	-
R. gallica L.	Sgal-12-AUT-4	12-AUT-1-SAC-4	Rosa gallica L.	12-AUT	Austria	-
R. gallica L.	Sgal-12-ITA-2	12-ITA-1-SAC-2	Rosa gallica L.	12-ITA	Italy	-
R. gallica L.	Sgal-12-ITA-3	12-ITA-1-SAC-3	Rosa gallica L.	12-ITA	Italy	-
R. gallica L.	Sgal-12-ITA-4	12-ITA-1-SAC-4	Rosa gallica L.	12-ITA	Italy	-
R. gallica L.	Sgal-12-POL-2	12-POL-1-SAC-2	Rosa gallica L.	12-POL	Poland	-
R. gallica L.	Sgal-12-POL-3	12-POL-1-SAC-3	Rosa gallica L.	12-POL	Poland	-
R. gallica L.	Sgal-12-POL-4	12-POL-1-SAC-4	Rosa gallica L.	12-POL	Poland	-
R. gallica L.	Sgal-13-CRO-3	13-CRO-1-SAC-3	Rosa gallica L.	13-CRO	Croatia	-
R. gallica L.	Sgal-13-CRO-5	13-CRO-1-SAC-5	Rosa gallica L.	13-CRO	Croatia	-
R. gallica L.	Sgal-13-ITA-3	13-ITA-3-SAC-3	Rosa gallica L.	13-ITA	Italy	-
R. gallica L.	Sgal-13-ITA-5	13-ITA-5-SAC-5	Rosa gallica L.	13-ITA	Italy	-
R. gallica L.	Sgal-13-ITA-8	13-ITA-8-SAC-8	Rosa gallica L.	13-ITA	Italy	-
R. gallica L.	Sgal-13-POL-1	13-POL-1-SAC-1	Rosa gallica L.	13-POL	Poland	-
R. gallica L.	Sgal-13-POL-4	13-POL-1-SAC-4	Rosa gallica L.	13-POL	Poland	-
R. gallica L.	Sgal-14-CRO-2	14-CRO-1-SAC-2	Rosa gallica L.	14-CRO	Croatia	-
R. gallica L.	Sgal-14-CRO-3	14-CRO-1-SAC-3	Rosa gallica L.	14-CRO	Croatia	-
R. gallica L.	Sgal-14-CRO-4	14-CRO-1-SAC-4	Rosa gallica L.	14-CRO	Croatia	-
R. gallica L.	Sgal-15-CRO-1	15-CRO-1-SAC-1	Rosa gallica L.	15-CRO	Croatia	-
R. gallica L.	Sgal-15-CRO-3	15-CRO-1-SAC-3	Rosa gallica L.	15-CRO	Croatia	-
R. gallica L.	Sgal-15-POL-4	15-POL-1-SAC-4	Rosa gallica L.	15-POL	Poland	-
R. gallica L.	Sgal-18-AUT-4	18-AUT-1-SAC-4	Rosa gallica L.	18-AUT	Austria	-

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R. gallica L.	Sgal-19-AUT-2	19-AUT-1-SAC-2	Rosa gallica L.	19-AUT	Austria	-
R. gallica L.	Sgal-19-AUT-4	19-AUT-1-SAC-4	Rosa gallica L.	19-AUT	Austria	-
R. gallica L.	Sgal-19-AUT-5	19-AUT-1-SAC-5	Rosa gallica L.	19-AUT	Austria	-
R. gallica L.	Sgal-1-ALL-1	1-ALL-1-SAC-1	Rosa gallica L.	1-ALL	Germany	-
R. gallica L.	Sgal-1-ALL-2	1-ALL-1-SAC-2	Rosa gallica L.	1-ALL	Germany	-
R. gallica L.	Sgal-1-AUT-1	1-AUT-1-SAC-1	Rosa gallica L.	1-AUT	Austria	-
R. gallica L.	Sgal-1-AUT-3	1-AUT-1-SAC-3	Rosa gallica L.	1-AUT	Austria	-
R. gallica L.	Sgal-1-AUT-4	1-AUT-1-SAC-4	Rosa gallica L.	1-AUT	Austria	-
R. gallica L.	Sgal-1-BASCONS-1	1-BASCONS-1-A01	Rosa gallica L.	1-BASCONS	France	-
R. gallica L.	Sgal-1-BASCONS-2	1-BASCONS-1-B01	Rosa gallica L.	1-BASCONS	France	-
R. gallica L.	Sgal-1-BASCONS-3	1-BASCONS-1-C01	Rosa gallica L.	1-BASCONS	France	-
R. gallica L.	Sgal-1-BILLY-2	1-BILLY-1-SAC-2	Rosa gallica L.	1-BILLY	France	-
R. gallica L.	Sgal-1-BILLY-3	1-BILLY-1-SAC-3	Rosa gallica L.	1-BILLY	France	-
R. gallica L.	Sgal-1-BILLY-4	1-BILLY-1-SAC-4	Rosa gallica L.	1-BILLY	France	-
R. gallica L.	Sgal-1-BOS-1	-	Rosa gallica L.	1-BOS	Bosnia	-
R. gallica L.	Sgal-1-CERDON-1	1-CERDON-1-SAC-1	Rosa gallica L.	1-CERDON	France	-
R. gallica L.	Sgal-1-CERDON-3	1-CERDON-1-SAC-3	Rosa gallica L.	1-CERDON	France	-
R. gallica L.	Sgal-1-CERDON-8	1-CERDON-2-SAC-8	Rosa gallica L.	1-CERDON	France	-
R. gallica L.	Sgal-1-CHAMADELLE-2	1-CHAMADELLE-1-F06	Rosa gallica L.	1-CHAMADELLE	France	-
R. gallica L.	Sgal-1-CHAMADELLE-3	1-CHAMADELLE-2-G06	Rosa gallica L.	1-CHAMADELLE	France	-
R. gallica L.	Sgal-1-CHAMADELLE-4	1-CHAMADELLE-2-H06	Rosa gallica L.	1-CHAMADELLE	France	-
R. gallica L.	Sgal-1-CZE-13	1-CZE-1-SAC-13	Rosa gallica L.	1-CZE	Czech Republic	-
R. gallica L.	Sgal-1-CZE-1	1-CZE-1-SAC-1	Rosa gallica L.	1-CZE	Czech Republic	-
R. gallica L.	Sgal-1-CZE-4	1-CZE-1-SAC-4	Rosa gallica L.	1-CZE	Czech Republic	-
R. gallica L.	Sgal-1-DOURS-7	1-DOURS-1-C02	Rosa gallica L.	1-DOURS	France	-
R. gallica L.	Sgal-1-DOURS-9	1-DOURS-1-E02	Rosa gallica L.	1-DOURS	France	-
R. gallica L.	Sgal-1-FIGEAC-1	1-FIGEAC-1-B11	Rosa gallica L.	1-FIGEAC	France	-
R. gallica L.	Sgal-1-FIGEAC-3	1-FIGEAC-1-SAC-3	Rosa gallica L.	1-FIGEAC	France	-
R. gallica L.	Sgal-1-FIGEAC-4	1-FIGEAC-1-D11	Rosa gallica L.	1-FIGEAC	France	-
R. gallica L.	Sgal-1-HEURS-1	1-HEURS-1-HERBIER-1	Rosa gallica L.	1-HEURS	France	-
R. gallica L.	Sgal-1-ITA-5	1-ITA-3-E01	Rosa gallica L.	1-ITA	Italy	-
R. gallica L.	Sgal-1-LAMARQUE-1	1-LAMARQUE-1-F02	Rosa gallica L.	1-LAMARQUE	France	-
R. gallica L.	Sgal-1-LAMARQUE-2	1-LAMARQUE-1-G02	Rosa gallica L.	1-LAMARQUE	France	-
R. gallica L.	Sgal-1-LAMARQUE-3	1-LAMARQUE-1-H02	Rosa gallica L.	1-LAMARQUE	France	-
R. gallica L.	Sgal-1-LAMARQUE-5	1-LAMARQUE-1-B03	Rosa gallica L.	1-LAMARQUE	France	-
R. gallica L.	Sgal-1-LE-VIGAN-1	1-LE-VIGAN-1-E11	Rosa gallica L.	1-LE-VIGAN	France	-
R. gallica L.	Sgal-1-LE-VIGAN-2	1-LE-VIGAN-2-F11	Rosa gallica L.	1-LE-VIGAN	France	-
R. gallica L.	Sgal-1-LE-VIGAN-3	1-LE-VIGAN-2-G11	Rosa gallica L.	1-LE-VIGAN	France	-
R. gallica L.	Sgal-1-LE-VIGAN-4	1-LE-VIGAN-2-H11	Rosa gallica L.	1-LE-VIGAN	France	-
R. gallica L.	Sgal-1-MOISSAC-1	1-MOISSAC-1-E06	Rosa gallica L.	1-MOISSAC	France	-
R. gallica L.	Sgal-1-MOISSAC-3	1-MOISSAC-1-G06	Rosa gallica L.	1-MOISSAC	France	-
R. gallica L.	Sgal-1-MOISSAC-5	1-MOISSAC-2-A07	Rosa gallica L.	1-MOISSAC	France	-
R. gallica L.	Sgal-1-MOISSAC-8	1-MOISSAC-1-D07	Rosa gallica L.	1-MOISSAC	France	-
R. gallica L.	Sgal-1-MOL-1	1-MOL-SAC-1	Rosa gallica L.	1-MOL	Moldova	-
R. gallica L.	Sgal-1-MOL-3	1-MOL-SAC-3	Rosa gallica L.	1-MOL	Moldova	-

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R. gallica L.	Sgal-1-MONTAUBAN-2	1-MONTAUBAN-1-F05	Rosa gallica L.	1-MONTAUBAN	France	-
R. gallica L.	Sgal-1-MONTAUBAN-3	1-MONTAUBAN-1-G05	Rosa gallica L.	1-MONTAUBAN	France	-
R. gallica L.	Sgal-1-MONTAUBAN-4	1-MONTAUBAN-1-H05	Rosa gallica L.	1-MONTAUBAN	France	-
R. gallica L.	Sgal-1-MONTDOURMEC-5	1-MONTDOURMEC-8-E10	Rosa gallica L.	1-MONTDOURMEC	France	-
R. gallica L.	Sgal-1-PESSAC-2	1-PESSAC-1-C06	Rosa gallica L.	1-PESSAC	France	-
R. gallica L.	Sgal-1-PESSAC-3	1-PESSAC-1-D06	Rosa gallica L.	1-PESSAC	France	-
R. gallica L.	Sgal-1-POL-2	1-POL-1-SAC-2	Rosa gallica L.	1-POL	Poland	-
R. gallica L.	Sgal-1-POL-3	1-POL-1-SAC-3	Rosa gallica L.	1-POL	Poland	-
R. gallica L.	Sgal-1-POL-4	1-POL-1-SAC-4	Rosa gallica L.	1-POL	Poland	-
R. gallica L.	Sgal-1-PUYCELCI-1	1-PUYCELCI-1-A02	Rosa gallica L.	1-PUYCELCI	France	-
R. gallica L.	Sgal-1-PUYCELCI-7	1-PUYCELCI-2-G02	Rosa gallica L.	1-PUYCELCI	France	-
R. gallica L.	Sgal-1-PUYCELCI-8	1-PUYCELCI-2-H02	Rosa gallica L.	1-PUYCELCI	France	-
R. gallica L.	Sgal-1-RABASTENS-3	1-RABASTENS-2-C01	Rosa gallica L.	1-RABASTENS	France	-
R. gallica L.	Sgal-1-REBRECHIEN-2	1-REBRECHIEN-1-SAC-2	Rosa gallica L.	1-REBRECHIEN	France	-
R. gallica L.	Sgal-1-ROU-2	1-ROU-1-SAC-2	Rosa gallica L.	1-ROU	Romania	-
R. gallica L.	Sgal-1-ROU-3	1-ROU-1-SAC-3	Rosa gallica L.	1-ROU	Romania	-
R. gallica L.	Sgal-1-ROU-4	1-ROU-1-SAC-4	Rosa gallica L.	1-ROU	Romania	-
R. gallica L.	Sgal-1-SAINT-LYE-LA-FORET-2	1-SAINT-LYE-LA-FORET-1-SAC-2	Rosa gallica L.	1-SAINT-LYE-LA-FORET	France	-
R. gallica L.	Sgal-1-SAINT-LYE-LA-FORET-3	1-SAINT-LYE-LA-FORET-1-SAC-3	Rosa gallica L.	1-SAINT-LYE-LA-FORET	France	-
R. gallica L.	Sgal-1-SAINT-MICHEL-1	1-SAINT-MICHEL-1-A06	Rosa gallica L.	1-SAINT-MICHEL	France	-
R. gallica L.	Sgal-1-SAINT-MICHEL-2	1-SAINT-MICHEL-1-B06	Rosa gallica L.	1-SAINT-MICHEL	France	-
R. gallica L.	Sgal-1-SAINT-MICHEL-4	1-SAINT-MICHEL-1-D06	Rosa gallica L.	1-SAINT-MICHEL	France	-
R. gallica L.	Sgal-1-SAVIGNAC-2	1-SAVIGNAC-1-E05	Rosa gallica L.	1-SAVIGNAC	France	-
R. gallica L.	Sgal-1-SAVIGNAC-3	1-SAVIGNAC-1-F05	Rosa gallica L.	1-SAVIGNAC	France	-
R. gallica L.	Sgal-1-SAVIGNAC-4	1-SAVIGNAC-1-G05	Rosa gallica L.	1-SAVIGNAC	France	-
R. gallica L.	Sgal-1-TEMPLE-1	1-TEMPLE-1-H04	Rosa gallica L.	1-TEMPLE	France	-
R. gallica L.	Sgal-1-TEMPLE-2	1-TEMPLE-1-A05	Rosa gallica L.	1-TEMPLE	France	-
R. gallica L.	Sgal-1-TEMPLE-3	1-TEMPLE-1-B05	Rosa gallica L.	1-TEMPLE	France	-
R. gallica L.	Sgal-1-TEMPLE-4	1-TEMPLE-1-C05	Rosa gallica L.	1-TEMPLE	France	-
R. gallica L.	Sgal-1-TOMBEBOEUF-4	1-TOMBEBOEUF-1-E04	Rosa gallica L.	1-TOMBEBOEUF	France	-
R. gallica L.	Sgal-1-TOMBEBOEUF-6	1-TOMBEBOEUF-3-G04	Rosa gallica L.	1-TOMBEBOEUF	France	-
R. gallica L.	Sgal-1-UKR-2	1-UKR-1-SAC-2	Rosa gallica L.	1-UKR	Ukraine	-
R. gallica L.	Sgal-1-UKR-6	1-UKR-1-SAC-6	Rosa gallica L.	1-UKR	Ukraine	-
R. gallica L.	Sgal-1-VENDOEUVRES-1	1-VENDOEUVRES-1-SAC-1	Rosa gallica L.	1-VENDOEUVRES	France	-
R. gallica L.	Sgal-1-VENDOEUVRES-2	1-VENDOEUVRES-1-SAC-2	Rosa gallica L.	1-VENDOEUVRES	France	-
R. gallica L.	Sgal-1-VENDOEUVRES-3	1-VENDOEUVRES-1-SAC-3	Rosa gallica L.	1-VENDOEUVRES	France	-
R. gallica L.	Sgal-1-VENDOEUVRES-4	1-VENDOEUVRES-1-SAC-4	Rosa gallica L.	1-VENDOEUVRES	France	-
R. gallica L.	Sgal-1-VIRAZEIL-2	1-VIRAZEIL-1-D03	Rosa gallica L.	1-VIRAZEIL	France	-
R. gallica L.	Sgal-1-VIRAZEIL-4	1-VIRAZEIL-1-F03	Rosa gallica L.	1-VIRAZEIL	France	-
R. gallica L.	Sgal-2-ALL-2	2-ALL-1-SAC-2	Rosa gallica L.	2-ALL	Germany	-
R. gallica L.	Sgal-2-ALL-4	2-ALL-1-SAC-4	Rosa gallica L.	2-ALL	Germany	-
R. gallica L.	Sgal-2-AUT-4	2-AUT-1-SAC-4	Rosa gallica L.	2-AUT	Austria	-
R. gallica L.	Sgal-2-CRO-3	2-CRO-1-SAC-3	Rosa gallica L.	2-CRO	Croatia	-
R. gallica L.	Sgal-2-CRO-5	2-CRO-2-SAC-5	Rosa gallica L.	2-CRO	Croatia	-
R. gallica L.	Sgal-2-CZE-3	2-CZE-1-SAC-3	Rosa gallica L.	2-CZE	Czech Republic	-

Category	Individual Name	ID individual	Species	Population Code	Country	Horticultural Group
R. gallica L.	Sgal-2-CZE-5	2-CZE-1-SAC-5	Rosa gallica L.	2-CZE	Czech Republic	-
R. gallica L.	Sgal-2-CZE-6	2-CZE-1-SAC-6	Rosa gallica L.	2-CZE	Czech Republic	-
R. gallica L.	Sgal-2-ITA-2	2-ITA-1-B02	Rosa gallica L.	2-ITA	Italy	-
R. gallica L.	Sgal-2-ITA-3	2-ITA-1-C02	Rosa gallica L.	2-ITA	Italy	-
R. gallica L.	Sgal-2-ITA-4	2-ITA-1-D02	Rosa gallica L.	2-ITA	Italy	-
R. gallica L.	Sgal-2-MOISSAC-1	2-MOISSAC-1-E07	Rosa gallica L.	2-MOISSAC	France	-
R. gallica L.	Sgal-2-MOISSAC-2	2-MOISSAC-1-F07	Rosa gallica L.	2-MOISSAC	France	-
R. gallica L.	Sgal-2-MOISSAC-3	2-MOISSAC-1-G07	Rosa gallica L.	2-MOISSAC	France	-
R. gallica L.	Sgal-2-MOISSAC-4	2-MOISSAC-2-H07	Rosa gallica L.	2-MOISSAC	France	-
R. gallica L.	Sgal-2-MOL-1	2-MOL-SAC-1	Rosa gallica L.	2-MOL	Moldova	-
R. gallica L.	Sgal-2-MOL-3	2-MOL-SAC-3	Rosa gallica L.	2-MOL	Moldova	-
R. gallica L.	Sgal-2-POL-2	2-POL-1-SAC-2	Rosa gallica L.	2-POL	Poland	-
R. gallica L.	Sgal-2-POL-3	2-POL-1-SAC-3	Rosa gallica L.	2-POL	Poland	-
R. gallica L.	Sgal-2-POL-4	2-POL-1-SAC-4	Rosa gallica L.	2-POL	Poland	-
R. gallica L.	Sgal-2-SAINT-LYE-LA-FORET-3	2-SAINT-LYE-LA-FORET-1-SAC-3	Rosa gallica L.	2-SAINT-LYE-LA-FORET	France	-
R. gallica L.	Sgal-2-SAINT-LYE-LA-FORET-6	2-SAINT-LYE-LA-FORET-2-SAC-6	Rosa gallica L.	2-SAINT-LYE-LA-FORET	France	-
R. gallica L.	Sgal-2-UKR-14	2-UKR-3-SAC-14	Rosa gallica L.	2-UKR	Ukraine	-
R. gallica L.	Sgal-2-UKR-24	2-UKR-8-HERBIER-24	Rosa gallica L.	2-UKR	Ukraine	-
R. gallica L.	Sgal-2-UKR-25	2-UKR-9-HERBIER-25	Rosa gallica L.	2-UKR	Ukraine	-
R. gallica L.	Sgal-2-UKR-4	2-UKR-1-SAC-4	Rosa gallica L.	2-UKR	Ukraine	-
R. gallica L.	Sgal-2-UKR-9	2-UKR-2-SAC-9	Rosa gallica L.	2-UKR	Ukraine	-
R. gallica L.	Sgal-3-AUT-2	3-AUT-1-SAC-2	Rosa gallica L.	3-AUT	Austria	-
R. gallica L.	Sgal-3-AUT-3	3-AUT-1-SAC-3	Rosa gallica L.	3-AUT	Austria	-
R. gallica L.	Sgal-3-AUT-4	3-AUT-1-SAC-4	Rosa gallica L.	3-AUT	Austria	-
R. gallica L.	Sgal-3-CRO-3	3-CRO-2-SAC-3	Rosa gallica L.	3-CRO	Croatia	-
R. gallica L.	Sgal-3-CZE-3	3-CZE-1-SAC-3	Rosa gallica L.	3-CZE	Czech Republic	-
R. gallica L.	Sgal-3-CZE-5	3-CZE-1-SAC-5	Rosa gallica L.	3-CZE	Czech Republic	-
R. gallica L.	Sgal-3-CZE-6	3-CZE-1-SAC-6	Rosa gallica L.	3-CZE	Czech Republic	-
R. gallica L.	Sgal-3-ESP-2	3-ESP-1-SAC-2	Rosa gallica L.	3-ESP	Spain	-
R. gallica L.	Sgal-3-ESP-3	3-ESP-1-SAC-3	Rosa gallica L.	3-ESP	Spain	-
R. gallica L.	Sgal-3-ITA-2	3-ITA-1-F02	Rosa gallica L.	3-ITA	Italy	-
R. gallica L.	Sgal-3-ITA-3	3-ITA-1-G02	Rosa gallica L.	3-ITA	Italy	-
R. gallica L.	Sgal-3-ROU-2	3-ROU-1-SAC-2	Rosa gallica L.	3-ROU	Romania	-
R. gallica L.	Sgal-3-ROU-4	3-ROU-1-SAC-4	Rosa gallica L.	3-ROU	Romania	-
R. gallica L.	Sgal-3-SLO-4	3-SLO-1-D07	Rosa gallica L.	3-SLO	Slovenia	-
R. gallica L.	Sgal-3-UKR-1	3-UKR-1-HERBIER-1	Rosa gallica L.	3-UKR	Ukraine	-
R. gallica L.	Sgal-4-AUT-1	4-AUT-1-SAC-1	Rosa gallica L.	4-AUT	Austria	-
R. gallica L.	Sgal-4-AUT-3	4-AUT-1-SAC-3	Rosa gallica L.	4-AUT	Austria	-
R. gallica L.	Sgal-4-AUT-4	4-AUT-1-SAC-4	Rosa gallica L.	4-AUT	Austria	-
R. gallica L.	Sgal-4-BOS-1	-	Rosa gallica L.	4-BOS	Bosnia	-
R. gallica L.	Sgal-4-CZE-3	4-CZE-1-SAC-3	Rosa gallica L.	4-CZE	Czech Republic	-
R. gallica L.	Sgal-4-ESP-1	4-ESP-1-SAC-1	Rosa gallica L.	4-ESP	Spain	-
R. gallica L.	Sgal-4-ESP-2	4-ESP-1-SAC-2	Rosa gallica L.	4-ESP	Spain	-
R. gallica L.	Sgal-4-ITA-2	4-ITA-1-SAC-2	Rosa gallica L.	4-ITA	Italy	-
R. gallica L.	Sgal-4-ITA-3	4-ITA-1-SAC-3	Rosa gallica L.	4-ITA	Italy	-

Category	Individual Name	ID individual	Species	Population Code	Country	Horticultural Group
R. gallica L.	Sgal-4-ROU-2	4-ROU-1-SAC-2	Rosa gallica L.	4-ROU	Romania	-
R. gallica L.	Sgal-4-ROU-3	4-ROU-1-SAC-3	Rosa gallica L.	4-ROU	Romania	-
R. gallica L.	Sgal-5-ALL-4	5-ALL-1-SAC-4	Rosa gallica L.	5-ALL	Germany	-
R. gallica L.	Sgal-5-AUT-2	5-AUT-1-SAC-2	Rosa gallica L.	5-AUT	Austria	-
R. gallica L.	Sgal-5-AUT-3	5-AUT-1-SAC-3	Rosa gallica L.	5-AUT	Austria	-
R. gallica L.	Sgal-5-CRO-2	5-CRO-1-SAC-2	Rosa gallica L.	5-CRO	Croatia	-
R. gallica L.	Sgal-5-CZE-2	5-CZE-1-SAC-2	Rosa gallica L.	5-CZE	Czech Republic	-
R. gallica L.	Sgal-5-ESP-1	5-ESP-1-SAC-1	Rosa gallica L.	5-ESP	Spain	-
R. gallica L.	Sgal-5-ESP-2	5-ESP-1-SAC-2	Rosa gallica L.	5-ESP	Spain	-
R. gallica L.	Sgal-5-ESP-3	5-ESP-1-SAC-3	Rosa gallica L.	5-ESP	Spain	-
R. gallica L.	Sgal-5-ESP-4	5-ESP-1-SAC-4	Rosa gallica L.	5-ESP	Spain	-
R. gallica L.	Sgal-5-HON-3	5-HON-1-SAC-3	Rosa gallica L.	5-HON	Hungary	-
R. gallica L.	Sgal-5-HON-4	5-HON-1-SAC-4	Rosa gallica L. var. magnifica Borb<e1>s	5-HON	Hungary	-
R. gallica L.	Sgal-5-ITA-2	5-ITA-1-SAC-2	Rosa gallica L.	5-ITA	Italy	-
R. gallica L.	Sgal-5-ITA-3	5-ITA-1-SAC-3	Rosa gallica L.	5-ITA	Italy	-
R. gallica L.	Sgal-5-ITA-4	5-ITA-1-SAC-4	Rosa gallica L.	5-ITA	Italy	-
R. gallica L.	Sgal-5-POL-1	5-POL-1-SAC-1	Rosa gallica L.	5-POL	Poland	-
R. gallica L.	Sgal-5-POL-2	5-POL-2-SAC-2	Rosa gallica L.	5-POL	Poland	-
R. gallica L.	Sgal-5-POL-3	5-POL-3-SAC-3	Rosa gallica L.	5-POL	Poland	-
R. gallica L.	Sgal-5-ROU-6	5-ROU-1-SAC-6	Rosa gallica L.	5-ROU	Romania	-
R. gallica L.	Sgal-6-ALL-1	6-ALL-1-SAC-1	Rosa gallica L.	6-ALL	Germany	-
R. gallica L.	Sgal-6-ALL-3	6-ALL-1-SAC-3	Rosa gallica L.	6-ALL	Germany	-
R. gallica L.	Sgal-6-ALL-5	6-ALL-1-SAC-5	Rosa gallica L.	6-ALL	Germany	-
R. gallica L.	Sgal-6-ALL-7	6-ALL-1-SAC-7	Rosa gallica L.	6-ALL	Germany	-
R. gallica L.	Sgal-6-AUT-2	6-AUT-1-SAC-2	Rosa gallica L.	6-AUT	Austria	-
R. gallica L.	Sgal-6-AUT-3	6-AUT-1-SAC-3	Rosa gallica L.	6-AUT	Austria	-
R. gallica L.	Sgal-6-AUT-4	6-AUT-1-SAC-4	Rosa gallica L.	6-AUT	Austria	-
R. gallica L.	Sgal-6-CRO-3	6-CRO-1-SAC-3	Rosa gallica L.	6-CRO	Croatia	-
R. gallica L.	Sgal-6-CZE-1	6-CZE-1-SAC-1	Rosa gallica L.	6-CZE	Czech Republic	-
R. gallica L.	Sgal-6-CZE-2	6-CZE-1-SAC-2	Rosa gallica L.	6-CZE	Czech Republic	-
R. gallica L.	Sgal-6-CZE-3	6-CZE-1-SAC-3	Rosa gallica L.	6-CZE	Czech Republic	-
R. gallica L.	Sgal-6-HON-3	6-HON-SAC-3	Rosa gallica L.	6-HON	Hungary	-
R. gallica L.	Sgal-6-HON-4	6-HON-SAC-4	Rosa gallica L.	6-HON	Hungary	-
R. gallica L.	Sgal-6-ITA-1	6-ITA-1-SAC-1	Rosa gallica L.	6-ITA	Italy	-
R. gallica L.	Sgal-6-ITA-6	6-ITA-1-SAC-6	Rosa gallica L.	6-ITA	Italy	-
R. gallica L.	Sgal-6-ITA-6	6-ITA-2-SAC-6	Rosa gallica L.	6-ITA	Italy	-
R. gallica L.	Sgal-6-POL-2	6-POL-2-SAC-2	Rosa gallica L.	6-POL	Poland	-
R. gallica L.	Sgal-6-POL-4	6-POL-4-SAC-4	Rosa gallica L.	6-POL	Poland	-
R. gallica L.	Sgal-6-ROU-2	6-ROU-2-SAC-2	Rosa gallica L.	6-ROU	Romania	-
R. gallica L.	Sgal-6-ROU-4	6-ROU-3-SAC-4	Rosa gallica L.	6-ROU	Romania	-
R. gallica L.	Sgal-6-SLO-2	6-SLO-1-H03	Rosa gallica L.	6-SLO	Slovenia	-
R. gallica L.	Sgal-7-ALL-1	7-ALL-1-SAC-1	Rosa gallica L.	7-ALL	Germany	-
R. gallica L.	Sgal-7-ALL-4	7-ALL-1-SAC-4	Rosa gallica L.	7-ALL	Germany	-
R. gallica L.	Sgal-7-AUT-2	7-AUT-1-SAC-2	Rosa gallica L.	7-AUT	Austria	-
R. gallica L.	Sgal-7-AUT-3	7-AUT-1-SAC-3	Rosa gallica L.	7-AUT	Austria	-

Category	Individual Name	ID individual	Species	Population Code	Country	Horticultural Group
R. gallica L.	Sgal-7-AUT-4	7-AUT-1-SAC-4	Rosa gallica L.	7-AUT	Austria	-
R. gallica L.	Sgal-7-CRO-1	7-CRO-1-SAC-1	Rosa gallica L.	7-CRO	Croatia	-
R. gallica L.	Sgal-7-CRO-2	7-CRO-1-SAC-2	Rosa gallica L.	7-CRO	Croatia	-
R. gallica L.	Sgal-7-CRO-4	7-CRO-1-SAC-4	Rosa gallica L.	7-CRO	Croatia	-
R. gallica L.	Sgal-7-CZE-4	7-CZE-1-SAC-4	Rosa gallica L.	7-CZE	Czech Republic	-
R. gallica L.	Sgal-7-ITA-1	7-ITA-1-SAC-1	Rosa gallica L.	7-ITA	Italy	-
R. gallica L.	Sgal-7-ITA-1	7-ITA-3-SAC-1	Rosa gallica L.	7-ITA	Italy	-
R. gallica L.	Sgal-7-ITA-1	7-ITA-4-SAC-1	Rosa gallica L.	7-ITA	Italy	-
R. gallica L.	Sgal-7-POL-3	7-POL-3-SAC-3	Rosa gallica L.	7-POL	Poland	-
R. gallica L.	Sgal-7-POL-4	7-POL-4-SAC-4	Rosa gallica L.	7-POL	Poland	-
R. gallica L.	Sgal-7-SLO-3	7-SLO-1-H02	Rosa gallica L.	7-SLO	Slovenia	-
R. gallica L.	Sgal-8-ALL-1	8-ALL-1-SAC-1	Rosa gallica L.	8-ALL	Germany	-
R. gallica L.	Sgal-8-ALL-3	8-ALL-1-SAC-3	Rosa gallica L.	8-ALL	Germany	-
R. gallica L.	Sgal-8-ALL-4	8-ALL-1-SAC-4	Rosa gallica L.	8-ALL	Germany	-
R. gallica L.	Sgal-8-AUT-2	8-AUT-1-SAC-2	Rosa gallica L.	8-AUT	Austria	-
R. gallica L.	Sgal-8-AUT-3	8-AUT-1-SAC-3	Rosa gallica L.	8-AUT	Austria	-
R. gallica L.	Sgal-8-AUT-4	8-AUT-1-SAC-4	Rosa gallica L.	8-AUT	Austria	-
R. gallica L.	Sgal-8-CRO-2	8-CRO-1-SAC-2	Rosa gallica L.	8-CRO	Croatia	-
R. gallica L.	Sgal-8-CRO-3	8-CRO-1-SAC-3	Rosa gallica L.	8-CRO	Croatia	-
R. gallica L.	Sgal-8-POL-5	8-POL-2-SAC-5	Rosa gallica L.	8-POL	Poland	-
R. gallica L.	Sgal-9-ALL-1	9-ALL-1-SAC-1	Rosa gallica L.	9-ALL	Germany	-
R. gallica L.	Sgal-9-ALL-3	9-ALL-1-SAC-3	Rosa gallica L.	9-ALL	Germany	-
R. gallica L.	Sgal-9-ALL-4	9-ALL-1-SAC-4	Rosa gallica L.	9-ALL	Germany	-
R. gallica L.	Sgal-9-AUT-2	9-AUT-1-SAC-2	Rosa gallica L.	9-AUT	Austria	-
R. gallica L.	Sgal-9-AUT-3	9-AUT-2-SAC-3	Rosa gallica L.	9-AUT	Austria	-
R. gallica L.	Sgal-9-AUT-4	9-AUT-2-SAC-4	Rosa gallica L.	9-AUT	Austria	-
R. gallica L.	Sgal-9-CRO-2	9-CRO-1-SAC-2	Rosa gallica L.	9-CRO	Croatia	-
R. gallica L.	Sgal-9-POL-1	9-POL-1-SAC-1	Rosa gallica L.	9-POL	Poland	-
R. gallica L.	Sgal-9-POL-2	9-POL-1-SAC-2	Rosa gallica L.	9-POL	Poland	-
R. gallica L.	Sgal-9-POL-4	9-POL-1-SAC-4	Rosa gallica L.	9-POL	Poland	-
R. gallica L.	Sgal-Altorf-E4	-	Rosa gallica L.	Altorf	France	-
R. gallica L.	Sgal-Altorf-F4	-	Rosa gallica L.	Altorf	France	-
R. gallica L.	Sgal-Altorf-H4	-	Rosa gallica L.	Altorf	France	-
R. gallica L.	Sgal-Amions-1	Amions (42) -1	Rosa gallica L.	Amions	France	-
R. gallica L.	Sgal-Amions-3	Amions (42) -3	Rosa gallica L.	Amions	France	-
R. gallica L.	Sgal-Amions-7	Amions (42) -7	Rosa gallica L.	Amions	France	-
R. gallica L.	Sgal-Amions-8	Amions (42) -8	Rosa gallica L.	Amions	France	-
R. gallica L.	Sgal-Aspremont-01-4	Aspremont 01 (04) -4	Rosa gallica L.	Aspremont-01	France	-
R. gallica L.	Sgal-Aspremont-01-6	Aspremont 01 (04) -6	Rosa gallica L.	Aspremont-01	France	-
R. gallica L.	Sgal-Brax-03-4	Brax 03 (31) -4	Rosa gallica L.	Brax-03	France	-
R. gallica L.	Sgal-Brax-03-7	-	Rosa gallica L.	Brax-03	France	-
R. gallica L.	Sgal-Chaponost-01-1	-	Rosa gallica L.	Chaponost-01	France	-
R. gallica L.	Sgal-Chaponost-01-3	-	Rosa gallica L.	Chaponost-01	France	-
R. gallica L.	Sgal-Chaponost-01-7	-	Rosa gallica L.	Chaponost-01	France	-
R. gallica L.	Sgal-Chateau-Arnoux-01-2	Ch<e2>teau Arnoux 01 (04) -2	Rosa gallica L.	Chateau-Arnoux-01	France	-

Category	Individual Name	ID individual	Species	Population Code	Country	Horticultural Group
R. gallica L.	Sgal-Chateau-Arnoux-01-3	Ch<e2>teau Arnoux 01 (04) -3	Rosa gallica L.	Chateau-Arnoux-01	France	-
R. gallica L.	Sgal-Chateau-Arnoux-01-4	Ch<e2>teau Arnoux 01 (04) -4	Rosa gallica L.	Chateau-Arnoux-01	France	-
R. gallica L.	Sgal-Cher-C1	-	Rosa gallica L.	Cher	France	-
R. gallica L.	Sgal-Cher-H1	-	Rosa gallica L.	Cher	France	-
R. gallica L.	Sgal-Cornebarrieu-01-3	-	Rosa gallica L.	Cornebarrieu-01	France	-
R. gallica L.	Sgal-Cornebarrieu-01-7	-	Rosa gallica L.	Cornebarrieu-01	France	-
R. gallica L.	Sgal-Couleuvre-12	Couleuvre (03) -12	Rosa gallica L.	Couleuvre	France	-
R. gallica L.	Sgal-Couleuvre-14	Couleuvre (03) -14	Rosa gallica L.	Couleuvre	France	-
R. gallica L.	Sgal-Couleuvre-16	Couleuvre (03) -16	Rosa gallica L.	Couleuvre	France	-
R. gallica L.	Sgal-Couleuvre-7	Couleuvre (03) -7	Rosa gallica L.	Couleuvre	France	-
R. gallica L.	Sgal-Couleuvre-9	Couleuvre (03) -9	Rosa gallica L.	Couleuvre	France	-
R. gallica L.	Sgal-Couzon-1	Couzon (03) -1	Rosa gallica L.	Couzon	France	-
R. gallica L.	Sgal-Couzon-3	Couzon (03) -3	Rosa gallica L.	Couzon	France	-
R. gallica L.	Sgal-Couzon-5	Couzon (03) -5	Rosa gallica L.	Couzon	France	-
R. gallica L.	Sgal-Couzon-7	Couzon (03) -7	Rosa gallica L.	Couzon	France	-
R. gallica L.	Sgal-Culhat-1	Culhat (63) -1	Rosa gallica L.	Culhat	France	-
R. gallica L.	Sgal-Culhat-3	Culhat (63) -3	Rosa gallica L.	Culhat	France	-
R. gallica L.	Sgal-Culhat-5	Culhat (63) -5	Rosa gallica L.	Culhat	France	-
R. gallica L.	Sgal-Culhat-7	Culhat (63) -7	Rosa gallica L.	Culhat	France	-
R. gallica L.	Sgal-Eyguians-02-8	Eyguians 02 (05) -8	Rosa gallica L.	Eyguians-02	France	-
R. gallica L.	Sgal-Ferney-Voltaire-02-3	-	Rosa gallica L.	Ferney-Voltaire-02	France	-
R. gallica L.	Sgal-Ferney-Voltaire-02-5	-	Rosa gallica L.	Ferney-Voltaire-02	France	-
R. gallica L.	Sgal-Fonsorbes-01-2	-	Rosa gallica L.	Fonsorbes-01	France	-
R. gallica L.	Sgal-Fonsorbes-01-5	Fonsorbes 01 (31)-5	Rosa gallica L.	Fonsorbes-01	France	-
R. gallica L.	Sgal-Fonsorbes-01-7	Fonsorbes 01 (31)-7	Rosa gallica L.	Fonsorbes-01	France	-
R. gallica L.	Sgal-Fonsorbes-Piquet-Souleri-366	rosa-gallica-366	Rosa gallica L.	Fonsorbes-Piquet-Souleri	France	-
R. gallica L.	Sgal-Fonsorbes-Piquet-Souleri-372	rosa-gallica-372	Rosa gallica L.	Fonsorbes-Piquet-Souleri	France	-
R. gallica L.	Sgal-Fonsorbes-Route-de-Seysses-291	rosa-gallica-291	Rosa gallica L.	Fonsorbes-Route-de-Seysses	France	-
R. gallica L.	Sgal-Fonsorbes-Route-de-Seysses-307	rosa-gallica-307	Rosa gallica L.	Fonsorbes-Route-de-Seysses	France	-
R. gallica L.	Sgal-Fonsorbes-Route-de-Seysses-364	rosa-gallica-364	Rosa gallica L.	Fonsorbes-Route-de-Seysses	France	-
R. gallica L.	Sgal-Fontenilles-01-4	-	Rosa gallica L.	Fontenilles-01	France	-
R. gallica L.	Sgal-Fontenilles-01-6	-	Rosa gallica L.	Fontenilles-01	France	-
R. gallica L.	Sgal-Fontenilles-01-8	Fontenilles 01 (31)-8	Rosa gallica L.	Fontenilles-01	France	-
R. gallica L.	Sgal-Fontenilles-Genibrat-137	rosa-gallica-137	Rosa gallica L.	Fontenilles-Genibrat	France	-
R. gallica L.	Sgal-Fontenilles-Genibrat-193	rosa-gallica-193	Rosa gallica L.	Fontenilles-Genibrat	France	-
R. gallica L.	Sgal-Grezieu-la-Varenne-01-1	-	Rosa gallica L.	Grezieu-la-Varenne-01	France	-
R. gallica L.	Sgal-Grezieu-la-Varenne-01-5	-	Rosa gallica L.	Grezieu-la-Varenne-01	France	-
R. gallica L.	Sgal-Grezieu-la-Varenne-01-7	-	Rosa gallica L.	Grezieu-la-Varenne-01	France	-
R. gallica L.	Sgal-Ingwiller-B1	-	Rosa gallica L.	Ingwiller	France	-
R. gallica L.	Sgal-Ingwiller-E1	-	Rosa gallica L.	Ingwiller	France	-
R. gallica L.	Sgal-Ingwiller-F1	-	Rosa gallica L.	Ingwiller	France	-
R. gallica L.	Sgal-La-Benisson-Dieu-2	La Benisson-Dieu (42) -2	Rosa gallica L.	La-Benisson-Dieu	France	-
R. gallica L.	Sgal-La-Benisson-Dieu-4	La Benisson-Dieu (42) -4	Rosa gallica L.	La-Benisson-Dieu	France	-
R. gallica L.	Sgal-La-Benisson-Dieu-6	La Benisson-Dieu (42) -6	Rosa gallica L.	La-Benisson-Dieu	France	-
R. gallica L.	Sgal-La-Benisson-Dieu-8	La Benisson-Dieu (42) -8	Rosa gallica L.	La-Benisson-Dieu	France	-

Category	Individual Name	ID individual	Species	Population Code	Country	Horticultural Group
R. gallica L.	Sgal-Leguevin-07-4	Leguevin 07 (31)-4	Rosa gallica L.	Leguevin-07	France	-
R. gallica L.	Sgal-Leguevin-07-7	Leguevin 07 (31)-7	Rosa gallica L.	Leguevin-07	France	-
R. gallica L.	Sgal-Leguevin-15-3	-	Rosa gallica L.	Leguevin-15	France	-
R. gallica L.	Sgal-Leguevin-15-5	-	Rosa gallica L.	Leguevin-15	France	-
R. gallica L.	Sgal-Leguevin-15-7	-	Rosa gallica L.	Leguevin-15	France	-
R. gallica L.	Sgal-Leguevin-20-1	-	Rosa gallica L.	Leguevin-20	France	-
R. gallica L.	Sgal-Leguevin-29-4	-	Rosa gallica L.	Leguevin-29	France	-
R. gallica L.	Sgal-Leguevin-29-6	-	Rosa gallica L.	Leguevin-29	France	-
R. gallica L.	Sgal-Leguevin-29-8	-	Rosa gallica L.	Leguevin-29	France	-
R. gallica L.	Sgal-Leguevin-Mader-71	rosa-gallica-71	Rosa gallica L.	Leguevin-Mader	France	-
R. gallica L.	Sgal-Mison-01-3	Mison 01 (04) -3	Rosa gallica L.	Mison-01	France	-
R. gallica L.	Sgal-Mison-01-5	Mison 01 (04) -5	Rosa gallica L.	Mison-01	France	-
R. gallica L.	Sgal-Mison-01-7	Mison 01 (04) -7	Rosa gallica L.	Mison-01	France	-
R. gallica L.	Sgal-Mondonville-05-2	-	Rosa gallica L.	Mondonville-05	France	-
R. gallica L.	Sgal-Mondonville-05-6	-	Rosa gallica L.	Mondonville-05	France	-
R. gallica L.	Sgal-Mondonville-05-7	Mondonville 05 (31) -7	Rosa gallica L.	Mondonville-05	France	-
R. gallica L.	Sgal-Mondonville-07-7	Mondonville 07 (31) -7	Rosa gallica L.	Mondonville-07	France	-
R. gallica L.	Sgal-Mondonville-07-8	-	Rosa gallica L.	Mondonville-07	France	-
R. gallica L.	Sgal-Morgon-05-3	Morgon 05 (69) -3	Rosa gallica L.	Morgon-05	France	-
R. gallica L.	Sgal-Morgon-06-2	Morgon 06 (69) -2	Rosa gallica L.	Morgon-06	France	-
R. gallica L.	Sgal-Morgon-06-3	Morgon 06 (69) -3	Rosa gallica L.	Morgon-06	France	-
R. gallica L.	Sgal-Morgon-06-4	Morgon 06 (69) -4	Rosa gallica L.	Morgon-06	France	-
R. gallica L.	Sgal-Morgon-08-1	Morgon 08 (69) -1	Rosa gallica L.	Morgon-08	France	-
R. gallica L.	Sgal-Morgon-08-3	Morgon 08 (69) -3	Rosa gallica L.	Morgon-08	France	-
R. gallica L.	Sgal-Morgon-08-4	Morgon 08 (69) -4	Rosa gallica L.	Morgon-08	France	-
R. gallica L.	Sgal-Morgon-09-3	-	Rosa gallica L.	Morgon-09	France	-
R. gallica L.	Sgal-Morgon-09-4	-	Rosa gallica L.	Morgon-09	France	-
R. gallica L.	Sgal-Neffes-01-8	Neffes 01 (05) -8	Rosa gallica L.	Neffes-01	France	-
R. gallica L.	Sgal-Neffes-02-2	-	Rosa gallica L.	Neffes-02	France	-
R. gallica L.	Sgal-Neffes-02-4	-	Rosa gallica L.	Neffes-02	France	-
R. gallica L.	Sgal-Neffes-02-6	-	Rosa gallica L.	Neffes-02	France	-
R. gallica L.	Sgal-Pelussin-1	Pelussin (42) -1	Rosa gallica L.	Pelussin	France	-
R. gallica L.	Sgal-Pelussin-3	Pelussin (42) -3	Rosa gallica L.	Pelussin	France	-
R. gallica L.	Sgal-Pelussin-5	Pelussin (42) -5	Rosa gallica L.	Pelussin	France	-
R. gallica L.	Sgal-Pelussin-7	Pelussin (42) -7	Rosa gallica L.	Pelussin	France	-
R. gallica L.	Sgal-Pibrac-20-15	Pibrac 20 (31) -15	Rosa gallica L.	Pibrac-20	France	-
R. gallica L.	Sgal-Pibrac-21-1	Pibrac 21 (31) -1	Rosa gallica L.	Pibrac-21	France	-
R. gallica L.	Sgal-Pibrac-21-3	Pibrac 21 (31) -3	Rosa gallica L.	Pibrac-21	France	-
R. gallica L.	Sgal-Pibrac-21-8	-	Rosa gallica L.	Pibrac-21	France	-
R. gallica L.	Sgal-Pibrac-L-Escalette-48	rosa-gallica-48	Rosa gallica L.	Pibrac-L-Escalette	France	-
R. gallica L.	Sgal-Pibrac-L-Escalette-50	rosa-gallica-50	Rosa gallica L.	Pibrac-L-Escalette	France	-
R. gallica L.	Sgal-Pibrac-L-Escalette-52	rosa-gallica-52	Rosa gallica L.	Pibrac-L-Escalette	France	-
R. gallica L.	Sgal-Plaisance-Du-Touch-Fonsorbe-D632-1138	rosa-gallica-1138	Rosa gallica L.	Plaisance-Du-Touch-Fonsorbe-D632-(route-de-Lombez)	France	-
R. gallica L.	Sgal-Plaisance-Du-Touch-Fonsorbe-D632-1140	rosa-gallica-1140	Rosa gallica L.	Plaisance-Du-Touch-Fonsorbe-D632-(route-de-Lombez)	France	-
R. gallica L.	Sgal-Plaisance-du-Touch-Lac-de-Bizarel-15	rosa-gallica-15	Rosa gallica L.	Plaisance-du-Touch-Lac-de-Bizarel	France	-

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R. gallica L.	Sgal-Plaisance-Touch-Ru-Agri-Perdi-779	rosa-gallica-779	Rosa gallica L.	Plaisance-du-Touch-Rue-Agricole-Perdiguier	France	-
R. gallica L.	Sgal-Plaisance-Touch-Rue-charmes-626	rosa-gallica-626	Rosa gallica L.	Plaisance-du-Touch-Rue-des-charmes	France	-
R. gallica L.	Sgal-Poucharramet-01-3	Poucharramet-01-3	Rosa gallica L.	Poucharramet-01	France	-
R. gallica L.	Sgal-Poucharramet-01-5	Poucharramet-01-5	Rosa gallica L.	Poucharramet-01	France	-
R. gallica L.	Sgal-Poucharramet-01-7	Poucharramet-01-7	Rosa gallica L.	Poucharramet-01	France	-
R. gallica L.	Sgal-Primelles-01-2	-	Rosa gallica L.	Primelles-01	France	-
R. gallica L.	Sgal-Primelles-01-3	-	Rosa gallica L.	Primelles-01	France	-
R. gallica L.	Sgal-Primelles-01-4	-	Rosa gallica L.	Primelles-01	France	-
R. gallica L.	Sgal-Primelles-02-1	-	Rosa gallica L.	Primelles-02	France	-
R. gallica L.	Sgal-Primelles-02-3	-	Rosa gallica L.	Primelles-02	France	-
R. gallica L.	Sgal-Revest-des-Brousses-01-1	-	Rosa gallica L.	Revest-des-Brousses-01	France	-
R. gallica L.	Sgal-Revest-des-Brousses-01-5	-	Rosa gallica L.	Revest-des-Brousses-01	France	-
R. gallica L.	Sgal-Revest-des-Brousses-01-7	-	Rosa gallica L.	Revest-des-Brousses-01	France	-
R. gallica L.	Sgal-Revest-des-Brousses-02-3	-	Rosa gallica L.	Revest-des-Brousses-02	France	-
R. gallica L.	Sgal-Revest-des-Brousses-02-5	-	Rosa gallica L.	Revest-des-Brousses-02	France	-
R. gallica L.	Sgal-Ringendorf-A1	-	Rosa gallica L.	Ringendorf	France	-
R. gallica L.	Sgal-Ringendorf-E1	-	Rosa gallica L.	Ringendorf	France	-
R. gallica L.	Sgal-Ringendorf-G4	-	Rosa gallica L.	Ringendorf	France	-
R. gallica L.	Sgal-Rosans-01-3	Rosans 01 (04) -3	Rosa gallica L.	Rosans-01	France	-
R. gallica L.	Sgal-Rosans-01-5	Rosans 01 (04) -5	Rosa gallica L.	Rosans-01	France	-
R. gallica L.	Sgal-Rosenwiller-C1	-	Rosa gallica L.	Rosenwiller	France	-
R. gallica L.	Sgal-Rosenwiller-E1	-	Rosa gallica L.	Rosenwiller	France	-
R. gallica L.	Sgal-Rosenwiller-G1	-	Rosa gallica L.	Rosenwiller	France	-
R. gallica L.	Sgal-Saint-Lys-Chemin-du-fustie-1159	rosa-gallica-1159	Rosa gallica L.	Saint-Lys-Chemin-du-fustie	France	-
R. gallica L.	Sgal-Saint-Lys-Chemin-du-fustie-1171	rosa-gallica-1171	Rosa gallica L.	Saint-Lys-Chemin-du-fustie	France	-
R. gallica L.	Sgal-Saint-Lys-Impasse-du-Prim-1145	rosa-gallica-1145	Rosa gallica L.	Saint-Lys-Impasse-du-Prim	France	-
R. gallica L.	Sgal-Saint-Lys-Impasse-du-Prim-1147	rosa-gallica-1147	Rosa gallica L.	Saint-Lys-Impasse-du-Prim	France	-
R. gallica L.	Sgal-Saint-Lys-Impasse-du-Prim-1149	rosa-gallica-1149	Rosa gallica L.	Saint-Lys-Impasse-du-Prim	France	-
R. gallica L.	Sgal-Saint-Lys-Juste-30	rosa-gallica-30	Rosa gallica L.	Saint-Lys-Juste	France	-
R. gallica L.	Sgal-Saint-Lys-Juste-37	rosa-gallica-37	Rosa gallica L.	Saint-Lys-Juste	France	-
R. gallica L.	Sgal-Saint-Lys-Juste-42	rosa-gallica-42	Rosa gallica L.	Saint-Lys-Juste	France	-
R. gallica L.	Sgal-Seiches-A1	-	Rosa gallica L.	Seiches	France	-
R. gallica L.	Sgal-Seiches-E1	-	Rosa gallica L.	Seiches	France	-
R. gallica L.	Sgal-Seiches-F1	-	Rosa gallica L.	Seiches	France	-
R. gallica L.	Sgal-Seysses-RD12-742	rosa-gallica-742	Rosa gallica L.	Seysses-RD12	France	-
R. gallica L.	Sgal-St-Aignan-A8	-	Rosa gallica L.	St Aignan	France	-
R. gallica L.	Sgal-St-Aignan-D8	-	Rosa gallica L.	St Aignan	France	-
R. gallica L.	Sgal-St-Aignan-E7	-	Rosa gallica L.	St Aignan	France	-
R. gallica L.	Sgal-St-Aignan-E8	-	Rosa gallica L.	St Aignan	France	-
R. gallica L.	Sgal-St-Aignan-G7	-	Rosa gallica L.	St Aignan	France	-
R. gallica L.	Sgal-St-Aignan-G8	-	Rosa gallica L.	St Aignan	France	-
R. gallica L.	Sgal-St-Aignan-H7	-	Rosa gallica L.	St Aignan	France	-
R. gallica L.	Sgal-Station1-Beaulieu-E1	-	Rosa gallica L.	Station1 Beaulieu	France	-
R. gallica L.	Sgal-Station1-Beaulieu-F1	-	Rosa gallica L.	Station1 Beaulieu	France	-
R. gallica L.	Sgal-Station1-Beaulieu-G1	-	Rosa gallica L.	Station1 Beaulieu	France	-

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R. gallica L.	Sgal-Station1-Beaulieu-H1	-	Rosa gallica L.	Station1 Beaulieu	France	-
R. gallica L.	Sgal-Station2-Beaulieu-A4	-	Rosa gallica L.	Station2 Beaulieu	France	-
R. gallica L.	Sgal-Station2-Beaulieu-D4	-	Rosa gallica L.	Station2 Beaulieu	France	-
R. gallica L.	Sgal-Station2-Beaulieu-F4	-	Rosa gallica L.	Station2 Beaulieu	France	-
R. gallica L.	Sgal-Station2-Beaulieu-G4	-	Rosa gallica L.	Station2 Beaulieu	France	-
R. gallica L.	Sgal-St-Bonnet-Troncais-1	St Bonnet- Troncais (03) -1	Rosa gallica L.	St-Bonnet-Troncais	France	-
R. gallica L.	Sgal-St-Bonnet-Troncais-3	St Bonnet- Troncais (03) -3	Rosa gallica L.	St-Bonnet-Troncais	France	-
R. gallica L.	Sgal-St-Bonnet-Troncais-5	St Bonnet- Troncais (03) -5	Rosa gallica L.	St-Bonnet-Troncais	France	-
R. gallica L.	Sgal-St-Bonnet-Troncais-7	St Bonnet- Troncais (03) -7	Rosa gallica L.	St-Bonnet-Troncais	France	-
R. gallica L.	Sgal-Ste-Foy-St-Sulpice-10	Ste Foy- St Sulpice (42) -10	Rosa gallica L.	Ste-Foy-St-Sulpice	France	-
R. gallica L.	Sgal-Ste-Foy-St-Sulpice-12	Ste Foy- St Sulpice (42) -12	Rosa gallica L.	Ste-Foy-St-Sulpice	France	-
R. gallica L.	Sgal-Ste-Foy-St-Sulpice-14	Ste Foy- St Sulpice (42) -14	Rosa gallica L.	Ste-Foy-St-Sulpice	France	-
R. gallica L.	Sgal-Ste-Foy-St-Sulpice-16	Ste Foy- St Sulpice (42) -16	Rosa gallica L.	Ste-Foy-St-Sulpice	France	-
R. gallica L.	Sgal-Ste-Foy-St-Sulpice-4	Ste Foy- St Sulpice (42) -4	Rosa gallica L.	Ste-Foy-St-Sulpice	France	-
R. gallica L.	Sgal-Ste-Foy-St-Sulpice-6	Ste Foy- St Sulpice (42) -6	Rosa gallica L.	Ste-Foy-St-Sulpice	France	-
R. gallica L.	Sgal-Ste-Foy-St-Sulpice-8	Ste Foy- St Sulpice (42) -8	Rosa gallica L.	Ste-Foy-St-Sulpice	France	-
R. gallica L.	Sgal-St-Etienne-des-Orgues-01-3	-	Rosa gallica L.	St-Etienne-des-Orgues-01	France	-
R. gallica L.	Sgal-St-Etienne-des-Orgues-01-7	-	Rosa gallica L.	St-Etienne-des-Orgues-01	France	-
R. gallica L.	Sgal-St-Etienne-des-Orgues-01-8	-	Rosa gallica L.	St-Etienne-des-Orgues-01	France	-
R. gallica L.	Sgal-St-Genis-Pouilly-01-7	St Genis Pouilly 01 (01) -7	Rosa gallica L.	St-Genis-Pouilly-01	France	-
R. gallica L.	Sgal-St-Medard-en-Forez-4	St Medard en Forez (42) -4	Rosa gallica L.	St-Medard-en-Forez	France	-
R. gallica L.	Sgal-St-Medard-en-Forez-6	St Medard en Forez (42) -6	Rosa gallica L.	St-Medard-en-Forez	France	-
R. gallica L.	Sgal-St-Medard-en-Forez-8	St Medard en Forez (42) -8	Rosa gallica L.	St-Medard-en-Forez	France	-
R. gallica L.	Sgal-Tallard-01-5	-	Rosa gallica L.	Tallard-01	France	-
R. gallica L.	Sgal-Tallard-01-7	Tallard 01 (05) -7	Rosa gallica L.	Tallard-01	France	-
R. gallica L.	Sgal-Tallard-02-1	Tallard 02 (05) -1	Rosa gallica L.	Tallard-02	France	-
R. gallica L.	Sgal-Tallard-02-3	Tallard 02 (05) -3	Rosa gallica L.	Tallard-02	France	-
R. gallica L.	Sgal-Tallard-02-7	Tallard 02 (05) -7	Rosa gallica L.	Tallard-02	France	-
R. gallica L.	Sgal-Thil-La-Trougne-770	rosa-gallica-770	Rosa gallica L.	Thil-La-Trougne	France	-
R. gallica L.	Sgal-Thil-La-Trougne-773	rosa-gallica-773	Rosa gallica L.	Thil-La-Trougne	France	-
R. gallica L.	Sgal-Ville-la-Grand-01-5	-	Rosa gallica L.	Ville-la-Grand-01	France	-
R. gallica L.	Sgal-Ville-la-Grand-01-7	-	Rosa gallica L.	Ville-la-Grand-01	France	-
R. gallica L.	Sgal-Ville-la-Grand-01-8	-	Rosa gallica L.	Ville-la-Grand-01	France	-
R. gallica L.	Sgal-Villie-Morgon-01-3	-	Rosa gallica L.	Villie-Morgon-01	France	-
R. gallica L.	Sgal-Viry-01-3	-	Rosa gallica L.	Viry-01	France	-
R. gallica L.	Sgal-Viry-01-5	-	Rosa gallica L.	Viry-01	France	-
R. gallica L.	Sgal-Viry-01-7	-	Rosa gallica L.	Viry-01	France	-
R. gallica L.	tetra-rgal-aigna	C7-St-Aignan	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-aigna	C7-St-Aignan	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-clo111	Clovis-11-1	Rosa gallica L.	-	Unknown	-
R. gallica L.	tetra-rgal-clo124	Clovis-12-4	Rosa gallica L.	-	Unknown	-
R. gallica L.	tetra-rgal-clo124	Clovis-12-4	Rosa gallica L.	-	Unknown	-
R. gallica L.	tetra-rgal-clo154	Clovis-15-4	Rosa gallica L.	-	Unknown	-
R. gallica L.	tetra-rgal-coulv	Couleuvre-(03)-9	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-coulv	Couleuvre-(03)-9	Rosa gallica L.	-	France	-

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R. gallica L.	tetra-rgal-df-m73-d3	M73-D3	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-df-m73-d4	M73-D4	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-df-m73-d5	M73-D5	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-df-m73-d6	M73-D6	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-df-m73-d7	M73-D7	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-df-m82-d10	M82-D10	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-df-m82-d2	M82-D2	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-df-m82-d4	M82-D4	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-df-m82-d6	M82-D6	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-df-m82-d7	M82-D7	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-eygui	Eyguians 02 (05) -6	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-eygui	Eyguians 02 (05) -6	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-ferne	Ferney-Voltaire-02-(01)--6	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-ferne	Ferney-Voltaire-02-(01)--6	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-m73	-	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-m73	-	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-m82	M82-Plaisance-du-touch-RD82-secteur-C-RG4	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-morgo	Morgon-02-(69)-7	Rosa gallica L.	-	France	-
R. gallica L.	tetra-rgal-pelus	Pelussin-(42)-8	Rosa gallica L.	Pelussin	France	-
R. gallica L.	tetra-rgal-pelus	Pelussin-(42)-8	Rosa gallica L.	Pelussin	France	-

Appendix 2. STRUCTURE results of the entire dataset. Genotypes were assigned to the most probable cluster MP > 0.5. Admixed individuals are marked with *.

Category	ID individual	Species / Horticultural Group	Year	Country	MP Cluster 1	MP cluster 2	Cluster
R. gallica	Sgal-3-UKR-2	Rosa gallica L.	-	Ukraine	0.9984	0.0016	1
R. gallica	Sgal-1-CHAMADELLE-1	Rosa gallica L.	-	France	0.9326	0.0674	1
R. gallica	Sgal-10-ALL-3	Rosa gallica L.	-	Germany	0.9968	0.0032	1
R. gallica	Sgal-10-ALL-4	Rosa gallica L.	-	Germany	0.4845	0.5155	2*
R. gallica	Sgal-10-AUT-2	Rosa gallica L.	-	Austria	0.9987	0.0013	1
R. gallica	Sgal-10-CRO-1	Rosa gallica L.	-	Croatia	0.9983	0.0017	1
R. gallica	Sgal-10-CRO-2	Rosa gallica L.	-	Croatia	0.9973	0.0027	1
R. gallica	Sgal-10-ITA-18026	Rosa gallica L.	-	Italy	0.9963	0.0037	1
R. gallica	Sgal-10-POL-3	Rosa gallica L.	-	Poland	0.9985	0.0015	1
R. gallica	Sgal-11-ALL-1	Rosa gallica L.	-	Germany	0.9975	0.0025	1
R. gallica	Sgal-11-ALL-2	Rosa gallica L.	-	Germany	0.9974	0.0026	1
R. gallica	Sgal-11-ALL-3	Rosa gallica L.	-	Germany	0.9979	0.0021	1
R. gallica	Sgal-11-ALL-4	Rosa gallica L.	-	Germany	0.9985	0.0015	1
R. gallica	Sgal-11-AUT-1	Rosa gallica L.	-	Austria	0.9977	0.0023	1
R. gallica	Sgal-11-AUT-2	Rosa gallica L.	-	Austria	0.9987	0.0013	1
R. gallica	Sgal-11-CRO-1	Rosa gallica L.	-	Croatia	0.9984	0.0016	1
R. gallica	Sgal-11-ITA-12654	Rosa gallica L.	-	Italy	0.9895	0.0105	1
R. gallica	Sgal-11-POL-1	Rosa gallica L.	-	Poland	0.9983	0.0017	1
R. gallica	Sgal-11-POL-2	Rosa gallica L.	-	Poland	0.9975	0.0025	1
R. gallica	Sgal-11-POL-4	Rosa gallica L.	-	Poland	0.9883	0.0117	1

Category	ID individual	Species / Horticultural Group	Year	Country	MP Cluster 1	MP cluster 2	Cluster
R. gallica	Sgal-12-AUT-2	Rosa gallica L.	-	Austria	0.9967	0.0033	1
R. gallica	Sgal-12-CRO-1	Rosa gallica L.	-	Croatia	0.9981	0.0019	1
R. gallica	Sgal-12-HON-1	Rosa gallica L.	-	Hungary	0.9835	0.0165	1
R. gallica	Sgal-12-ITA-1	Rosa gallica L.	-	Italy	0.9987	0.0013	1
R. gallica	Sgal-12-POL-1	Rosa gallica L.	-	Poland	0.9983	0.0017	1
R. gallica	Sgal-13-AUT-1	Rosa gallica L.	-	Austria	0.9979	0.0021	1
R. gallica	Sgal-13-AUT-2	Rosa gallica L.	-	Austria	0.9978	0.0022	1
R. gallica	Sgal-13-CRO-1	Rosa gallica L.	-	Croatia	0.9975	0.0025	1
R. gallica	Sgal-13-CRO-4	Rosa gallica L.	-	Croatia	0.9962	0.0038	1
R. gallica	Sgal-13-ITA-2	Rosa gallica L.	-	Italy	0.9979	0.0021	1
R. gallica	Sgal-13-ITA-6	Rosa gallica L.	-	Italy	0.9978	0.0022	1
R. gallica	Sgal-13-POL-3	Rosa gallica L.	-	Poland	0.9987	0.0013	1
R. gallica	Sgal-13-POL-2	Rosa gallica L.	-	Poland	0.9987	0.0013	1
R. gallica	Sgal-14-AUT-1	Rosa gallica L.	-	Austria	0.9985	0.0015	1
R. gallica	Sgal-14-CRO-1	Rosa gallica L.	-	Croatia	0.9987	0.0013	1
R. gallica	Sgal-14-POL-1	Rosa gallica L.	-	Poland	0.3705	0.6295	2*
R. gallica	Sgal-14-POL-2	Rosa gallica L.	-	Poland	0.49	0.51	2*
R. gallica	Sgal-14-POL-4	Rosa gallica L.	-	Poland	0.4837	0.5163	2*
R. gallica	Sgal-15-AUT-1	Rosa gallica L.	-	Austria	0.9979	0.0021	1
R. gallica	Sgal-15-AUT-2	Rosa gallica L.	-	Austria	0.9977	0.0023	1
R. gallica	Sgal-15-CRO-4	Rosa gallica L.	-	Croatia	0.9917	0.0083	1
R. gallica	Sgal-15-POL-1	Rosa gallica L.	-	Poland	0.9986	0.0014	1
R. gallica	Sgal-15-POL-2	Rosa gallica L.	-	Poland	0.9979	0.0021	1
R. gallica	Sgal-15-POL-3	Rosa gallica L.	-	Poland	0.9979	0.0021	1
R. gallica	Sgal-16-AUT-1	Rosa gallica L.	-	Austria	0.9987	0.0013	1
R. gallica	Sgal-16-AUT-2	Rosa gallica L.	-	Austria	0.9981	0.0019	1
R. gallica	Sgal-16-POL-1	Rosa gallica L.	-	Poland	0.9987	0.0013	1
R. gallica	Sgal-16-POL-2	Rosa gallica L.	-	Poland	0.9977	0.0023	1
R. gallica	Sgal-16-POL-3	Rosa gallica L.	-	Poland	0.9979	0.0021	1
R. gallica	Sgal-16-POL-4	Rosa gallica L.	-	Poland	0.9979	0.0021	1
R. gallica	Sgal-17-AUT-1	Rosa gallica L.	-	Austria	0.9986	0.0014	1
R. gallica	Sgal-18-AUT-1	Rosa gallica L.	-	Austria	0.9988	0.0012	1
R. gallica	Sgal-18-AUT-2	Rosa gallica L.	-	Austria	0.9989	0.0011	1
R. gallica	Sgal-19-AUT-1	Rosa gallica L.	-	Austria	0.9978	0.0022	1
R. gallica	Sgal-1-ALL-3	Rosa gallica L.	-	Germany	0.9961	0.0039	1
R. gallica	Sgal-1-ALL-4	Rosa gallica L.	-	Germany	0.9973	0.0027	1
R. gallica	Sgal-1-AUT-2	Rosa gallica L.	-	Austria	0.9986	0.0014	1
R. gallica	Sgal-1-BILLY-1	Rosa gallica L.	-	France	0.9553	0.0447	1
R. gallica	Sgal-1-CERDON-5	Rosa gallica L.	-	France	0.9329	0.0671	1
R. gallica	Sgal-1-CORQUOY-1	Rosa gallica L.	-	France	0.9772	0.0228	1
R. gallica	Sgal-1-CORQUOY-3	Rosa gallica L.	-	France	0.9721	0.0279	1
R. gallica	Sgal-1-CORQUOY-5	Rosa gallica L.	-	France	0.9908	0.0092	1
R. gallica	Sgal-1-CORQUOY-7	Rosa gallica L.	-	France	0.9766	0.0234	1
R. gallica	Sgal-1-CRO-1	Rosa gallica L.	-	Croatia	0.9986	0.0014	1
R. gallica	Sgal-1-CRO-2	Rosa gallica L.	-	Croatia	0.9986	0.0014	1

Category	ID individual	Species / Horticultural Group	Year	Country	MP Cluster 1	MP cluster 2	Cluster
R. gallica	Sgal-1-CRO-3	Rosa gallica L.	-	Croatia	0.7287	0.2713	1*
R. gallica	Sgal-1-CRO-4	Rosa gallica L.	-	Croatia	0.9974	0.0026	1
R. gallica	Sgal-1-CZE-11	Rosa gallica L.	-	Czech Republic	0.9989	0.0011	1
R. gallica	Sgal-1-DOURS-1	Rosa gallica L.	-	France	0.9691	0.0309	1
R. gallica	Sgal-1-ESP-1	Rosa gallica L.	-	Spain	0.0683	0.9317	2
R. gallica	Sgal-3-UKR-4	Rosa gallica L.	-	Ukraine	0.9972	0.0028	1
R. gallica	Sgal-1-ITA-1	Rosa gallica L.	-	Italy	0.9971	0.0029	1
R. gallica	Sgal-1-ITA-3	Rosa gallica L.	-	Italy	0.9989	0.0011	1
R. gallica	Sgal-1-ITA-4	Rosa gallica L.	-	Italy	0.9983	0.0017	1
R. gallica	Sgal-1-ITA-6	Rosa gallica L.	-	Italy	0.9986	0.0014	1
R. gallica	Sgal-1-ITA-7	Rosa gallica L.	-	Italy	0.9986	0.0014	1
R. gallica	Sgal-1-MOL-2	Rosa gallica L.	-	Moldova	0.9977	0.0023	1
R. gallica	Sgal-1-MONTAUBAN-1	Rosa gallica L.	-	France	0.9344	0.0656	1
R. gallica	Sgal-1-MONTDOURMEC-1	Rosa gallica L.	-	France	0.9669	0.0331	1
R. gallica	Sgal-1-MONTDOURMEC-7	Rosa gallica L.	-	France	0.968	0.032	1
R. gallica	Sgal-1-MONTDOURMEC-9	Rosa gallica L.	-	France	0.9788	0.0212	1
R. gallica	Sgal-1-PESSAC-1	Rosa gallica L.	-	France	0.731	0.269	1*
R. gallica	Sgal-1-PESSAC-4	Rosa gallica L.	-	France	0.9345	0.0655	1
R. gallica	Sgal-1-POL-1	Rosa gallica L.	-	Poland	0.9988	0.0012	1
R. gallica	Sgal-1-PRIMELLES-15	Rosa gallica L.	-	France	0.9736	0.0264	1
R. gallica	Sgal-1-PRIMELLES-16	Rosa gallica L.	-	France	0.9597	0.0403	1
R. gallica	Sgal-1-PRIMELLES-1	Rosa gallica L.	-	France	0.9631	0.0369	1
R. gallica	Sgal-1-PRIMELLES-2	Rosa gallica L.	-	France	0.9687	0.0313	1
R. gallica	Sgal-1-PRIMELLES-4	Rosa gallica L.	-	France	0.9513	0.0487	1
R. gallica	Sgal-1-PRIMELLES-7	Rosa gallica L.	-	France	0.9767	0.0233	1
R. gallica	Sgal-1-PRIMELLES-8	Rosa gallica L.	-	France	0.9604	0.0396	1
R. gallica	Sgal-1-PRIMELLES-9	Rosa gallica L.	-	France	0.9674	0.0326	1
R. gallica	Sgal-1-REBRECHIEN-1	Rosa gallica L.	-	France	0.9331	0.0669	1
R. gallica	Sgal-1-REBRECHIEN-3	Rosa gallica L.	-	France	0.9563	0.0437	1
R. gallica	Sgal-1-REBRECHIEN-4	Rosa gallica L.	-	France	0.9581	0.0419	1
R. gallica	Sgal-1-ROU-1	Rosa gallica L.	-	Romania	0.9927	0.0073	1
R. gallica	Sgal-1-SAINT-CIRQ-10	Rosa gallica L.	-	France	0.9959	0.0041	1
R. gallica	Sgal-1-SAINT-CIRQ-11	Rosa gallica L.	-	France	0.9751	0.0249	1
R. gallica	Sgal-1-SAINT-CIRQ-12	Rosa gallica L.	-	France	0.9947	0.0053	1
R. gallica	Sgal-1-SAINT-CIRQ-14	Rosa gallica L.	-	France	0.9976	0.0024	1
R. gallica	Sgal-1-SAINT-CIRQ-15	Rosa gallica L.	-	France	0.9739	0.0261	1
R. gallica	Sgal-1-SAINT-CIRQ-1	Rosa gallica L.	-	France	0.998	0.002	1
R. gallica	Sgal-1-SAINT-CIRQ-3	Rosa gallica L.	-	France	0.997	0.003	1
R. gallica	Sgal-1-SAINT-CIRQ-5	Rosa gallica L.	-	France	0.9941	0.0059	1
R. gallica	Sgal-1-SAINT-CIRQ-6	Rosa gallica L.	-	France	0.9768	0.0232	1
R. gallica	Sgal-1-SAINT-CIRQ-7	Rosa gallica L.	-	France	0.9963	0.0037	1
R. gallica	Sgal-1-SAINT-CIRQ-8	Rosa gallica L.	-	France	0.9967	0.0033	1
R. gallica	Sgal-1-SAINT-LYE-LA-FORET-1	Rosa gallica L.	-	France	0.9346	0.0654	1
R. gallica	Sgal-1-SAINT-NAUPHARY-11	Rosa gallica L.	-	France	0.9581	0.0419	1
R. gallica	Sgal-1-SAINT-NAUPHARY-12	Rosa gallica L.	-	France	0.9689	0.0311	1

Category	ID individual	Species / Horticultural Group	Year	Country	MP Cluster 1	MP cluster 2	Cluster
R. gallica	Sgal-1-SAINT-NAUPHARY-13	Rosa gallica L.	-	France	0.9471	0.0529	1
R. gallica	Sgal-1-SAINT-NAUPHARY-15	Rosa gallica L.	-	France	0.9453	0.0547	1
R. gallica	Sgal-1-SAINT-NAUPHARY-17	Rosa gallica L.	-	France	0.9612	0.0388	1
R. gallica	Sgal-1-SAINT-NAUPHARY-1	Rosa gallica L.	-	France	0.9537	0.0463	1
R. gallica	Sgal-1-SAINT-NAUPHARY-20	Rosa gallica L.	-	France	0.9586	0.0414	1
R. gallica	Sgal-1-SAINT-NAUPHARY-3	Rosa gallica L.	-	France	0.9565	0.0435	1
R. gallica	Sgal-1-SAINT-NAUPHARY-6	Rosa gallica L.	-	France	0.9747	0.0253	1
R. gallica	Sgal-1-SAINT-NAUPHARY-9	Rosa gallica L.	-	France	0.9353	0.0647	1
R. gallica	Sgal-1-SAVIGNAC-6	Rosa gallica L.	-	France	0.7743	0.2257	1*
R. gallica	Sgal-1-SLK-1	Rosa gallica L.	-	Slovakia	0.9979	0.0021	1
R. gallica	Sgal-1-SLO-1	Rosa gallica L.	-	Slovenia	0.0703	0.9297	2
R. gallica	Sgal-1-SLO-6	Rosa gallica L.	-	Slovenia	0.0749	0.9251	2
R. gallica	Sgal-1-UKR-1	Rosa gallica L.	-	Ukraine	0.9988	0.0012	1
R. gallica	Sgal-1-UKR-8	Rosa gallica L.	-	Ukraine	0.9977	0.0023	1
R. gallica	Sgal-1-VIRAZEIL-1	Rosa gallica L.	-	France	0.9639	0.0361	1
R. gallica	Sgal-2-ALL-1	Rosa gallica L.	-	Germany	0.9983	0.0017	1
R. gallica	Sgal-2-ALL-3	Rosa gallica L.	-	Germany	0.9983	0.0017	1
R. gallica	Sgal-2-AUT-1	Rosa gallica L.	-	Austria	0.9989	0.0011	1
R. gallica	Sgal-2-AUT-2	Rosa gallica L.	-	Austria	0.9986	0.0014	1
R. gallica	Sgal-2-AUT-3	Rosa gallica L.	-	Austria	0.9987	0.0013	1
R. gallica	Sgal-2-BOS-1	Rosa gallica L.	-	Bosnia	0.0125	0.9875	2
R. gallica	Sgal-2-CRO-2	Rosa gallica L.	-	Croatia	0.9936	0.0064	1
R. gallica	Sgal-2-CRO-4	Rosa gallica L.	-	Croatia	0.945	0.055	1
R. gallica	Sgal-2-CZE-1	Rosa gallica L.	-	Czech Republic	0.9989	0.0011	1
R. gallica	Sgal-2-ESP-1	Rosa gallica L.	-	Spain	0.0114	0.9886	2
R. gallica	Sgal-2-HON-1	Rosa gallica L.	-	Hungary	0.9975	0.0025	1
R. gallica	Sgal-2-HON-2	Rosa gallica L.	-	Hungary	0.9974	0.0026	1
R. gallica	Sgal-2-ITA-1	Rosa gallica L.	-	Italy	0.9905	0.0095	1
R. gallica	Sgal-2-MOL-2	Rosa gallica L.	-	Moldova	0.9926	0.0074	1
R. gallica	Sgal-2-POL-1	Rosa gallica L.	-	Poland	0.9955	0.0045	1
R. gallica	Sgal-2-PRIMELLES-11	Rosa gallica L.	-	France	0.9703	0.0297	1
R. gallica	Sgal-2-PRIMELLES-13	Rosa gallica L.	-	France	0.9943	0.0057	1
R. gallica	Sgal-2-PRIMELLES-1	Rosa gallica L.	-	France	0.9967	0.0033	1
R. gallica	Sgal-2-PRIMELLES-3	Rosa gallica L.	-	France	0.9827	0.0173	1
R. gallica	Sgal-2-PRIMELLES-5	Rosa gallica L.	-	France	0.957	0.043	1
R. gallica	Sgal-2-PRIMELLES-7	Rosa gallica L.	-	France	0.9743	0.0257	1
R. gallica	Sgal-2-PRIMELLES-8	Rosa gallica L.	-	France	0.9839	0.0161	1
R. gallica	Sgal-2-ROU-1	Rosa gallica L.	-	Romania	0.9982	0.0018	1
R. gallica	Sgal-2-ROU-2	Rosa gallica L.	-	Romania	0.9971	0.0029	1
R. gallica	Sgal-2-ROU-4	Rosa gallica L.	-	Romania	0.9979	0.0021	1
R. gallica	Sgal-2-SAINT-LYE-LA-FORET-1	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-2-SAINT-LYE-LA-FORET-8	Rosa gallica L.	-	France	0.9329	0.0671	1
R. gallica	Sgal-2-SLO-11	Rosa gallica L.	-	Slovenia	0.9987	0.0013	1
R. gallica	Sgal-2-SLO-12	Rosa gallica L.	-	Slovenia	0.9977	0.0023	1
R. gallica	Sgal-2-SLO-13	Rosa gallica L.	-	Slovenia	0.9735	0.0265	1

Category	ID individual	Species / Horticultural Group	Year	Country	MP Cluster 1	MP cluster 2	Cluster
R. gallica	Sgal-2-SLO-14	Rosa gallica L.	-	Slovenia	0.9977	0.0023	1
R. gallica	Sgal-2-SLO-15	Rosa gallica L.	-	Slovenia	0.9988	0.0012	1
R. gallica	Sgal-2-SLO-1	Rosa gallica L.	-	Slovenia	0.1143	0.8857	2
R. gallica	Sgal-2-SLO-2	Rosa gallica L.	-	Slovenia	0.0759	0.9241	2
R. gallica	Sgal-2-SLO-3	Rosa gallica L.	-	Slovenia	0.9963	0.0037	1
R. gallica	Sgal-2-SLO-5	Rosa gallica L.	-	Slovenia	0.9973	0.0027	1
R. gallica	Sgal-2-SLO-7	Rosa gallica L.	-	Slovenia	0.9983	0.0017	1
R. gallica	Sgal-2-SLO-9	Rosa gallica L.	-	Slovenia	0.9971	0.0029	1
R. gallica	Sgal-2-UKR-18	Rosa gallica L.	-	Ukraine	0.9937	0.0063	1
R. gallica	Sgal-2-UKR-1	Rosa gallica L.	-	Ukraine	0.9989	0.0011	1
R. gallica	Sgal-2-UKR-21	Rosa gallica L.	-	Ukraine	0.9989	0.0011	1
R. gallica	Sgal-2-UKR-6	Rosa gallica L.	-	Ukraine	0.9873	0.0127	1
R. gallica	Sgal-3-ALL-1	Rosa gallica L.	-	Germany	0.9978	0.0022	1
R. gallica	Sgal-3-ALL-3	Rosa gallica L.	-	Germany	0.998	0.002	1
R. gallica	Sgal-3-AUT-1	Rosa gallica L.	-	Austria	0.9988	0.0012	1
R. gallica	Sgal-3-BOS-1	Rosa gallica L.	-	Bosnia	0.0757	0.9243	2
R. gallica	Sgal-3-CRO-4	Rosa gallica L.	-	Croatia	0.9978	0.0022	1
R. gallica	Sgal-3-CZE-1	Rosa gallica L.	-	Czech Republic	0.9917	0.0083	1
R. gallica	Sgal-3-ESP-1	Rosa gallica L.	-	Spain	0.945	0.055	1
R. gallica	Sgal-3-HON-1	Rosa gallica L.	-	Hungary	0.9965	0.0035	1
R. gallica	Sgal-3-HON-2	Rosa gallica L.	-	Hungary	0.9985	0.0015	1
R. gallica	Sgal-3-ITA-1	Rosa gallica L.	-	Italy	0.9958	0.0042	1
R. gallica	Sgal-3-POL-1	Rosa gallica L.	-	Poland	0.9982	0.0018	1
R. gallica	Sgal-3-POL-3	Rosa gallica L.	-	Poland	0.9987	0.0013	1
R. gallica	Sgal-3-POL-4	Rosa gallica L.	-	Poland	0.998	0.002	1
R. gallica	Sgal-3-POL-6	Rosa gallica L.	-	Poland	0.9989	0.0011	1
R. gallica	Sgal-3-ROU-1	Rosa gallica L.	-	Romania	0.9969	0.0031	1
R. gallica	Sgal-3-ROU-3	Rosa gallica L.	-	Romania	0.9979	0.0021	1
R. gallica	Sgal-3-SLO-2	Rosa gallica L.	-	Slovenia	0.9875	0.0125	1
R. gallica	Sgal-3-UKR-3	Rosa gallica L.	-	Ukraine	0.9974	0.0026	1
R. gallica	Sgal-4-ALL-1	Rosa gallica L.	-	Germany	0.9979	0.0021	1
R. gallica	Sgal-4-ALL-2	Rosa gallica L.	-	Germany	0.9986	0.0014	1
R. gallica	Sgal-4-ALL-3	Rosa gallica L.	-	Germany	0.9979	0.0021	1
R. gallica	Sgal-4-ALL-4	Rosa gallica L.	-	Germany	0.9987	0.0013	1
R. gallica	Sgal-4-AUT-2	Rosa gallica L.	-	Austria	0.9989	0.0011	1
R. gallica	Sgal-4-CRO-1	Rosa gallica L.	-	Croatia	0.0737	0.9263	2
R. gallica	Sgal-4-CRO-4	Rosa gallica L.	-	Croatia	0.1225	0.8775	2
R. gallica	Sgal-4-CZE-1	Rosa gallica L.	-	Czech Republic	0.9796	0.0204	1
R. gallica	Sgal-4-CZE-2	Rosa gallica L.	-	Czech Republic	0.9985	0.0015	1
R. gallica	Sgal-4-CZE-4	Rosa gallica L.	-	Czech Republic	0.9958	0.0042	1
R. gallica	Sgal-4-HON-1	Rosa gallica L.	-	Hungary	0.9977	0.0023	1
R. gallica	Sgal-4-ITA-1	Rosa gallica L.	-	Italy	0.9985	0.0015	1
R. gallica	Sgal-4-POL-1	Rosa gallica L.	-	Poland	0.9988	0.0012	1
R. gallica	Sgal-4-POL-2	Rosa gallica L.	-	Poland	0.9988	0.0012	1
R. gallica	Sgal-4-POL-3	Rosa gallica L.	-	Poland	0.9986	0.0014	1

Category	ID individual	Species / Horticultural Group	Year	Country	MP Cluster 1	MP cluster 2	Cluster
R. gallica	Sgal-4-POL-4	Rosa gallica L.	-	Poland	0.9977	0.0023	1
R. gallica	Sgal-4-ROU-1	Rosa gallica L.	-	Romania	0.9987	0.0013	1
R. gallica	Sgal-4-SLO-1	Rosa gallica L.	-	Slovenia	0.9809	0.0191	1
R. gallica	Sgal-4-SLO-2	Rosa gallica L.	-	Slovenia	0.9983	0.0017	1
R. gallica	Sgal-4-SLO-4	Rosa gallica L.	-	Slovenia	0.9988	0.0012	1
R. gallica	Sgal-4-SLO-6	Rosa gallica L.	-	Slovenia	0.9978	0.0022	1
R. gallica	Sgal-4-SLO-7	Rosa gallica L.	-	Slovenia	0.9797	0.0203	1
R. gallica	Sgal-4-SLO-8	Rosa gallica L.	-	Slovenia	0.9987	0.0013	1
R. gallica	Sgal-5-ALL-3	Rosa gallica L.	-	Germany	0.9989	0.0011	1
R. gallica	Sgal-5-AUT-1	Rosa gallica L.	-	Austria	0.9957	0.0043	1
R. gallica	Sgal-5-AUT-4	Rosa gallica L.	-	Austria	0.9978	0.0022	1
R. gallica	Sgal-5-CRO-1	Rosa gallica L.	-	Croatia	0.9989	0.0011	1
R. gallica	Sgal-5-CRO-3	Rosa gallica L.	-	Croatia	0.9968	0.0032	1
R. gallica	Sgal-5-CRO-4	Rosa gallica L.	-	Croatia	0.9977	0.0023	1
R. gallica	Sgal-5-CZE-1	Rosa gallica L.	-	Czech Republic	0.9969	0.0031	1
R. gallica	Sgal-5-CZE-4	Rosa gallica L.	-	Czech Republic	0.9984	0.0016	1
R. gallica	Sgal-5-HON-1	Rosa gallica L.	-	Hungary	0.9979	0.0021	1
R. gallica	Sgal-5-HON-2	Rosa gallica L.	-	Hungary	0.9985	0.0015	1
R. gallica	Sgal-5-ITA-1	Rosa gallica L.	-	Italy	0.9919	0.0081	1
R. gallica	Sgal-5-POL-4	Rosa gallica L.	-	Poland	0.9987	0.0013	1
R. gallica	Sgal-5-ROU-1	Rosa gallica L.	-	Romania	0.9979	0.0021	1
R. gallica	Sgal-5-ROU-3	Rosa gallica L.	-	Romania	0.9979	0.0021	1
R. gallica	Sgal-5-ROU-4	Rosa gallica L.	-	Romania	0.9987	0.0013	1
R. gallica	Sgal-5-SLO-1	Rosa gallica L.	-	Slovenia	0.9929	0.0071	1
R. gallica	Sgal-6-ALL-10	Rosa gallica L.	-	Germany	0.9443	0.0557	1
R. gallica	Sgal-6-AUT-1	Rosa gallica L.	-	Austria	0.9987	0.0013	1
R. gallica	Sgal-6-CRO-2	Rosa gallica L.	-	Croatia	0.9978	0.0022	1
R. gallica	Sgal-6-CZE-4	Rosa gallica L.	-	Czech Republic	0.9979	0.0021	1
R. gallica	Sgal-6-HON-1	Rosa gallica L.	-	Hungary	0.9977	0.0023	1
R. gallica	Sgal-6-HON-2	Rosa gallica L.	-	Hungary	0.9983	0.0017	1
R. gallica	Sgal-6-ITA-1	Rosa gallica L.	-	Italy	0.9981	0.0019	1
R. gallica	Sgal-6-POL-1	Rosa gallica L.	-	Poland	0.9979	0.0021	1
R. gallica	Sgal-6-POL-3	Rosa gallica L.	-	Poland	0.9958	0.0042	1
R. gallica	Sgal-6-ROU-1	Rosa gallica L.	-	Romania	0.9882	0.0118	1
R. gallica	Sgal-6-ROU-3	Rosa gallica L.	-	Romania	0.9978	0.0022	1
R. gallica	Sgal-6-UKR-1	Rosa gallica L.	-	Ukraine	0.9979	0.0021	1
R. gallica	Sgal-6-UKR-2	Rosa gallica L.	-	Ukraine	0.9981	0.0019	1
R. gallica	Sgal-6-UKR-3	Rosa gallica L.	-	Ukraine	0.9978	0.0022	1
R. gallica	Sgal-6-UKR-4	Rosa gallica L.	-	Ukraine	0.9888	0.0112	1
R. gallica	Sgal-6-UKR-5	Rosa gallica L.	-	Ukraine	0.9813	0.0187	1
R. gallica	Sgal-6-UKR-6	Rosa gallica L.	-	Ukraine	0.9982	0.0018	1
R. gallica	Sgal-6-UKR-7	Rosa gallica L.	-	Ukraine	0.9925	0.0075	1
R. gallica	Sgal-6-UKR-8	Rosa gallica L.	-	Ukraine	0.9951	0.0049	1
R. gallica	Sgal-6-UKR-9	Rosa gallica L.	-	Ukraine	0.9756	0.0244	1
R. gallica	Sgal-7-ALL-2	Rosa gallica L.	-	Germany	0.9977	0.0023	1

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R. gallica	Sgal-7-ALL-3	Rosa gallica L.	-	Germany	0.9984	0.0016	1
R. gallica	Sgal-7-AUT-1	Rosa gallica L.	-	Austria	0.9983	0.0017	1
R. gallica	Sgal-7-CRO-3	Rosa gallica L.	-	Croatia	0.0951	0.9049	2
R. gallica	Sgal-7-CZE-1	Rosa gallica L.	-	Czech Republic	0.9981	0.0019	1
R. gallica	Sgal-7-CZE-2	Rosa gallica L.	-	Czech Republic	0.9965	0.0035	1
R. gallica	Sgal-7-CZE-3	Rosa gallica L.	-	Czech Republic	0.9979	0.0021	1
R. gallica	Sgal-7-HON-1	Rosa gallica L.	-	Hungary	0.9978	0.0022	1
R. gallica	Sgal-7-ITA-1	Rosa gallica L.	-	Italy	0.9987	0.0013	1
R. gallica	Sgal-7-POL-1	Rosa gallica L.	-	Poland	0.9977	0.0023	1
R. gallica	Sgal-7-POL-2	Rosa gallica L.	-	Poland	0.9922	0.0078	1
R. gallica	Sgal-7-ROU-1	Rosa gallica L.	-	Romania	0.9958	0.0042	1
R. gallica	Sgal-7-ROU-2	Rosa gallica L.	-	Romania	0.9981	0.0019	1
R. gallica	Sgal-7-ROU-3	Rosa gallica L.	-	Romania	0.995	0.005	1
R. gallica	Sgal-7-ROU-4	Rosa gallica L.	-	Romania	0.9938	0.0062	1
R. gallica	Sgal-7-UKR-1	Rosa gallica L.	-	Ukraine	0.9983	0.0017	1
R. gallica	Sgal-8-ALL-2	Rosa gallica L.	-	Germany	0.9978	0.0022	1
R. gallica	Sgal-8-AUT-1	Rosa gallica L.	-	Austria	0.9975	0.0025	1
R. gallica	Sgal-8-CRO-1	Rosa gallica L.	-	Croatia	0.9921	0.0079	1
R. gallica	Sgal-8-ITA-4295	Rosa gallica L.	-	Italy	0.9987	0.0013	1
R. gallica	Sgal-8-POL-1	Rosa gallica L.	-	Poland	0.9981	0.0019	1
R. gallica	Sgal-8-POL-7	Rosa gallica L.	-	Poland	0.9979	0.0021	1
R. gallica	Sgal-8-ROU-2	Rosa gallica L.	-	Romania	0.9986	0.0014	1
R. gallica	Sgal-8-ROU-3	Rosa gallica L.	-	Romania	0.9986	0.0014	1
R. gallica	Sgal-9-ALL-2	Rosa gallica L.	-	Germany	0.9978	0.0022	1
R. gallica	Sgal-9-AUT-1	Rosa gallica L.	-	Austria	0.9979	0.0021	1
R. gallica	Sgal-9-CRO-1	Rosa gallica L.	-	Croatia	0.9923	0.0077	1
R. gallica	Sgal-9-HON-1	Rosa gallica L.	-	Hungary	0.9711	0.0289	1
R. gallica	Sgal-9-POL-3	Rosa gallica L.	-	Poland	0.9987	0.0013	1
R. gallica	Sgal-Altorf-A4	Rosa gallica L.	-	France	0.9935	0.0065	1
R. gallica	Sgal-Aspremont-01-2	Rosa gallica L.	-	France	0.9987	0.0013	1
R. gallica	Sgal-Aspremont-01-8	Rosa gallica L.	-	France	0.9936	0.0064	1
R. gallica	Sgal-Brax-03-2	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Brax-03-6	Rosa gallica L.	-	France	0.933	0.067	1
R. gallica	Sgal-Chaponost-01-5	Rosa gallica L.	-	France	0.9503	0.0497	1
R. gallica	Sgal-Chateau-Arnoux-01-1	Rosa gallica L.	-	France	0.9988	0.0012	1
R. gallica	Sgal-Cher-A1	Rosa gallica L.	-	France	0.9631	0.0369	1
R. gallica	Sgal-Cher-E1	Rosa gallica L.	-	France	0.9979	0.0021	1
R. gallica	Sgal-Cornebarrieu-01-1	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Cornebarrieu-01-5	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Daux-Bichou-763	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Eyguians-01-1	Rosa gallica L.	-	France	0.9969	0.0031	1
R. gallica	Sgal-Eyguians-01-3	Rosa gallica L.	-	France	0.9971	0.0029	1
R. gallica	Sgal-Eyguians-02-6	Rosa gallica L.	-	France	0.9963	0.0037	1
R. gallica	Sgal-Ferney-Voltaire-01-2	Rosa gallica L.	-	France	0.9959	0.0041	1
R. gallica	Sgal-Ferney-Voltaire-02-1	Rosa gallica L.	-	France	0.9962	0.0038	1

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R. gallica	Sgal-Fonsorbes-01-3	Rosa gallica L.	-	France	0.9363	0.0637	1
R. gallica	Sgal-Fonsorbes-Piquet-Souleri-368	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Fonsorbes-Route-de-Seysses-283	Rosa gallica L.	-	France	0.9335	0.0665	1
R. gallica	Sgal-Fonsorbes-Saint-Flour-RD65a-381	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Fonsorbes-Saint-Flour-RD65a-386	Rosa gallica L.	-	France	0.9329	0.0671	1
R. gallica	Sgal-Fontenilles-01-3	Rosa gallica L.	-	France	0.9483	0.0517	1
R. gallica	Sgal-Fontenilles-Genibrat-88	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Fontenilles-Genibrat-144	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Fontenilles-Genibrat-192	Rosa gallica L.	-	France	0.9331	0.0669	1
R. gallica	Sgal-Fontenilles-Genibrat-194	Rosa gallica L.	-	France	0.9328	0.0672	1
R. gallica	Sgal-Fontenilles-Genibrat-196	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Fontienne-01-2	Rosa gallica L.	-	France	0.9935	0.0065	1
R. gallica	Sgal-Fontienne-01-4	Rosa gallica L.	-	France	0.9943	0.0057	1
R. gallica	Sgal-Fontienne-01-6	Rosa gallica L.	-	France	0.9987	0.0013	1
R. gallica	Sgal-Fontienne-01-8	Rosa gallica L.	-	France	0.9987	0.0013	1
R. gallica	Sgal-GAL-01	Rosa gallica L.	-	Germany	0.9988	0.0012	1
R. gallica	Sgal-Grezieu-la-Varenne-01-3	Rosa gallica L.	-	France	0.9629	0.0371	1
R. gallica	Sgal-Ingwiller-H1	Rosa gallica L.	-	France	0.9971	0.0029	1
R. gallica	Sgal-Leguevin-07-2	Rosa gallica L.	-	France	0.9331	0.0669	1
R. gallica	Sgal-Leguevin-15-1	Rosa gallica L.	-	France	0.9326	0.0674	1
R. gallica	Sgal-Leguevin-20-2	Rosa gallica L.	-	France	0.9329	0.0671	1
R. gallica	Sgal-Leguevin-20-7	Rosa gallica L.	-	France	0.9331	0.0669	1
R. gallica	Sgal-Leguevin-20-8	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Leguevin-29-2	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Leguevin-College-Dechetterie-712	Rosa gallica L.	-	France	0.9326	0.0674	1
R. gallica	Sgal-Leguevin-College-Dechetterie-391	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Leguevin-entre-college-et-dechetterie-425	Rosa gallica L.	-	France	0.9335	0.0665	1
R. gallica	Sgal-Leguevin-entre-college-et-dechetterie-598	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Leguevin-Mader-55	Rosa gallica L.	-	France	0.9385	0.0615	1
R. gallica	Sgal-Leguevin-Mader-58	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Leguevin-Mader-63	Rosa gallica L.	-	France	0.9326	0.0674	1
R. gallica	Sgal-Leguevin-Mader-66	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Mison-01-1	Rosa gallica L.	-	France	0.9976	0.0024	1
R. gallica	Sgal-Mondonville-05-1	Rosa gallica L.	-	France	0.9399	0.0601	1
R. gallica	Sgal-Mondonville-07-1	Rosa gallica L.	-	France	0.9333	0.0667	1
R. gallica	Sgal-Morgon-05-1	Rosa gallica L.	-	France	0.9891	0.0109	1
R. gallica	Sgal-Morgon-05-2	Rosa gallica L.	-	France	0.9761	0.0239	1
R. gallica	Sgal-Morgon-05-4	Rosa gallica L.	-	France	0.9528	0.0472	1
R. gallica	Sgal-Morgon-06-1	Rosa gallica L.	-	France	0.9567	0.0433	1
R. gallica	Sgal-Morgon-08-2	Rosa gallica L.	-	France	0.9639	0.0361	1
R. gallica	Sgal-Morgon-09-1	Rosa gallica L.	-	France	0.9579	0.0421	1
R. gallica	Sgal-Neffes-01-2	Rosa gallica L.	-	France	0.9972	0.0028	1
R. gallica	Sgal-Neffes-01-6	Rosa gallica L.	-	France	0.9976	0.0024	1
R. gallica	Sgal-Neffes-02-8	Rosa gallica L.	-	France	0.9982	0.0018	1
R. gallica	Sgal-Pibrac-20-13	Rosa gallica L.	-	France	0.9327	0.0673	1

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R. gallica	Sgal-Pibrac-20-16	Rosa gallica L.	-	France	0.9335	0.0665	1
R. gallica	Sgal-Pibrac-20-1	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Pibrac-20-3	Rosa gallica L.	-	France	0.9326	0.0674	1
R. gallica	Sgal-Pibrac-20-5	Rosa gallica L.	-	France	0.9319	0.0681	1
R. gallica	Sgal-Pibrac-20-6	Rosa gallica L.	-	France	0.9321	0.0679	1
R. gallica	Sgal-Pibrac-20-7	Rosa gallica L.	-	France	0.9328	0.0672	1
R. gallica	Sgal-Pibrac-21-7	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Pibrac-Grand-Perramond-198	Rosa gallica L.	-	France	0.9331	0.0669	1
R. gallica	Sgal-Pibrac-Grand-Perramond-223	Rosa gallica L.	-	France	0.9357	0.0643	1
R. gallica	Sgal-Pibrac-Grand-Perramond-759	Rosa gallica L.	-	France	0.9333	0.0667	1
R. gallica	Sgal-Pibrac-L-Escalette-46	Rosa gallica L.	-	France	0.9329	0.0671	1
R. gallica	Sgal-Plaisance-Du-Touch-Fonsorbe-D632-1136	Rosa gallica L.	-	France	0.9329	0.0671	1
R. gallica	Sgal-Plaisance-du-Touch-Lac-de-Bizarel-11	Rosa gallica L.	-	France	0.933	0.067	1
R. gallica	Sgal-Plaisance-du-Touch-Lac-de-Bizarel-2	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Plaisance-du-Touch-Lac-de-Bizarel-7	Rosa gallica L.	-	France	0.9417	0.0583	1
R. gallica	Sgal-Plaisance-du-Touch-RD82-secteur-B-811	Rosa gallica L.	-	France	0.0702	0.9298	2
R. gallica	Sgal-Plaisance-du-Touch-RD82-secteur-B-962	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Plaisance-du-Touch-RD82-secteur-C-1129	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Plaisance-du-Touch-RD82-secteur-C-1132	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Plaisance-du-Touch-RD82-secteur-C-808	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Plaisance-du-Touch-Rue-Agricole-Perdiguier-786	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Plaisance-du-Touch-Rue-des-charmes-618	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Plaisance-du-Touch-Rue-des-charmes-633	Rosa gallica L.	-	France	0.9335	0.0665	1
R. gallica	Sgal-Plaisance-du-Touch-Rue-des-charmes-649	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Plaisance-du-Touch-Rue-de-la-solidarite-776	Rosa gallica L.	-	France	0.93	0.07	1
R. gallica	Sgal-Poucharramet-01-2	Rosa gallica L.	-	France	0.9333	0.0667	1
R. gallica	Sgal-Primelles-01-1	Rosa gallica L.	-	France	0.9897	0.0103	1
R. gallica	Sgal-Primelles-02-2	Rosa gallica L.	-	France	0.9701	0.0299	1
R. gallica	Sgal-Primelles-02-4	Rosa gallica L.	-	France	0.9716	0.0284	1
R. gallica	Sgal-Revest-des-Brousses-01-3	Rosa gallica L.	-	France	0.9983	0.0017	1
R. gallica	Sgal-Revest-des-Brousses-02-1	Rosa gallica L.	-	France	0.9983	0.0017	1
R. gallica	Sgal-Revest-des-Brousses-02-7	Rosa gallica L.	-	France	0.9982	0.0018	1
R. gallica	Sgal-Ringendorf-A7	Rosa gallica L.	-	France	0.9971	0.0029	1
R. gallica	Sgal-Ringendorf-B4	Rosa gallica L.	-	France	0.9976	0.0024	1
R. gallica	Sgal-Ringendorf-G1	Rosa gallica L.	-	France	0.997	0.003	1
R. gallica	Sgal-Rosans-01-1	Rosa gallica L.	-	France	0.9953	0.0047	1
R. gallica	Sgal-Rosans-01-7	Rosa gallica L.	-	France	0.9985	0.0015	1
R. gallica	Sgal-Rosenwiller-A1	Rosa gallica L.	-	France	0.9975	0.0025	1
R. gallica	Sgal-Saint-Lys-Chemin-du-fustie-1152	Rosa gallica L.	-	France	0.9339	0.0661	1
R. gallica	Sgal-Saint-Lys-Chemin-du-fustie-1165	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Saint-Lys-Impasse-du-Prim-1143	Rosa gallica L.	-	France	0.9328	0.0672	1
R. gallica	Sgal-Saint-Lys-Juste-23	Rosa gallica L.	-	France	0.9598	0.0402	1
R. gallica	Sgal-Seiches-B1	Rosa gallica L.	-	France	0.9323	0.0677	1
R. gallica	Sgal-Seysses-RD12-746	Rosa gallica L.	-	France	0.9332	0.0668	1
R. gallica	Sgal-Seysses-RD50-725	Rosa gallica L.	-	France	0.9335	0.0665	1

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R. gallica	Sgal-Seysses-RD50-728	Rosa gallica L.	-	France	0.9337	0.0663	1
R. gallica	Sgal-Seysses-RD50-736	Rosa gallica L.	-	France	0.9519	0.0481	1
R. gallica	Sgal-Ste-Foy-St-Sulpice-2	Rosa gallica L.	-	France	0.9667	0.0333	1
R. gallica	Sgal-St-Etienne-des-Orgues-01-1	Rosa gallica L.	-	France	0.9971	0.0029	1
R. gallica	Sgal-St-Genis-Pouilly-01-2	Rosa gallica L.	-	France	0.9976	0.0024	1
R. gallica	Sgal-St-Genis-Pouilly-02-2	Rosa gallica L.	-	France	0.9981	0.0019	1
R. gallica	Sgal-St-Genis-Pouilly-02-7	Rosa gallica L.	-	France	0.9967	0.0033	1
R. gallica	Sgal-Tallard-01-3	Rosa gallica L.	-	France	0.998	0.002	1
R. gallica	Sgal-Tallard-02-5	Rosa gallica L.	-	France	0.9975	0.0025	1
R. gallica	Sgal-Thil-La-Trougne-767	Rosa gallica L.	-	France	0.9326	0.0674	1
R. gallica	Sgal-Tournefeuille-02-2	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Tournefeuille-02-4	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Tournefeuille-02-6	Rosa gallica L.	-	France	0.9331	0.0669	1
R. gallica	Sgal-Tournefeuille-02-8	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	Sgal-Verneugheol-2	Rosa gallica L.	-	France	0.0717	0.9283	2
R. gallica	Sgal-Verneugheol-4	Rosa gallica L.	-	France	0.0711	0.9289	2
R. gallica	Sgal-Verneugheol-6	Rosa gallica L.	-	France	0.0753	0.9247	2
R. gallica	Sgal-Verneugheol-8	Rosa gallica L.	-	France	0.0693	0.9307	2
R. gallica	Sgal-Ville-la-Grand-01-3	Rosa gallica L.	-	France	0.9951	0.0049	1
R. gallica	Sgal-Villie-Morgon-01-1	Rosa gallica L.	-	France	0.9576	0.0424	1
R. gallica	Sgal-Villie-Morgon-01-5	Rosa gallica L.	-	France	0.9588	0.0412	1
R. gallica	Sgal-Villie-Morgon-01-7	Rosa gallica L.	-	France	0.9769	0.0231	1
R. gallica	Sgal-Viry-01-1	Rosa gallica L.	-	France	0.9963	0.0037	1
R. gallica	Sgal-Viry-02-1	Rosa gallica L.	-	France	0.9957	0.0043	1
R. gallica	Sgal-Viry-02-4	Rosa gallica L.	-	France	0.9949	0.0051	1
R. gallica	Sgal-Viry-02-7	Rosa gallica L.	-	France	0.9929	0.0071	1
R. gallica	tetra-rgal-clo111	Rosa gallica L.	-	-	0.9243	0.0757	1
R. gallica	tetra-rgal-clo154	Rosa gallica L.	-	-	0.9327	0.0673	1
R. gallica	tetra-rgal-df-m73-d3	Rosa gallica L.	-	France	0.9326	0.0674	1
R. gallica	tetra-rgal-df-m73-d4	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	tetra-rgal-df-m73-d5	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	tetra-rgal-df-m73-d6	Rosa gallica L.	-	France	0.9329	0.0671	1
R. gallica	tetra-rgal-df-m73-d7	Rosa gallica L.	-	France	0.9328	0.0672	1
R. gallica	tetra-rgal-df-m82-d10	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	tetra-rgal-df-m82-d2	Rosa gallica L.	-	France	0.9326	0.0674	1
R. gallica	tetra-rgal-df-m82-d4	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	tetra-rgal-df-m82-d6	Rosa gallica L.	-	France	0.9328	0.0672	1
R. gallica	tetra-rgal-df-m82-d7	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	tetra-rgal-m82	Rosa gallica L.	-	France	0.9327	0.0673	1
R. gallica	tetra-rgal-morgo	Rosa gallica L.	-	France	0.9579	0.0421	1
Cultivated	elisabeth-d-angleterre-10-F3	Unknown	1817	-	0.0684	0.9316	2
Cultivated	abrahamsgarden-9-A8	Hybrid Gallica	Unknown	-	0.5301	0.4699	1*
Cultivated	adele-7-C12	Hybrid Gallica	1814	-	0.9327	0.0673	1
Cultivated	adele-heu-10-A4	Hybrid Gallica	1816	-	0.9326	0.0674	1
Cultivated	adele-pavie-16-G2	Moss	1850	-	0.6386	0.3614	1*

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Cultivated	adele-prevost-9-E2	Hybrid Gallica	1830	-	0.6466	0.3534	1*
Cultivated	a-feuilles-de-chanvre-16-C9	Alba	1807	-	0.4378	0.5622	2*
Cultivated	agar-16-H4	Hybrid Gallica	1843	-	0.9325	0.0675	1
Cultivated	agatha-16-B6	Hybrid Gallica	1817	-	0.6387	0.3613	1*
Cultivated	agathe-fatime-9-B1	Hybrid Gallica	1815	-	0.9209	0.0791	1
Cultivated	aimable-amie-9-G2	Hybrid Gallica	1818	-	0.6148	0.3852	1*
Cultivated	alain-blanchard-7-F9	Hybrid Gallica	1839	-	0.9433	0.0567	1
Cultivated	alector-cramoisi-15-H7	Hybrid Gallica	1811	-	0.9325	0.0675	1
Cultivated	a-longs-pedoncules-16-A1	Moss	1851	-	0.0683	0.9317	2
Cultivated	ambroise-pare-16-C6	Hybrid Gallica	1846	-	0.9326	0.0674	1
Cultivated	amelia-16-H2	Alba	1823	-	0.0855	0.9145	2
Cultivated	amelie-de-mansfield-16-G8	Hybrid Gallica	1823	-	0.9327	0.0673	1
Cultivated	anais-16-F10	Hybrid Gallica	1817	-	0.1168	0.8832	2
Cultivated	incomparable-d-auteuil-10-E1	Centifolia	1828	-	0.9336	0.0664	1
Cultivated	angelique-quetier-14-G10	Moss	1839	-	0.9329	0.0671	1
Cultivated	anna-maria-de-montravel-11-G12	Polyantha	1879	-	0.0011	0.9989	2
Cultivated	antonia-d-ormois-15-B5	Hybrid Gallica	1835	-	0.9517	0.0483	1
Cultivated	ariadne-8-C10	Hybrid Gallica	1818	-	0.9344	0.0656	1
Cultivated	aristobule-16-B1	Moss	1849	-	0.846	0.154	1
Cultivated	armide-8-A11	Alba	1817	-	0.5373	0.4627	1*
Cultivated	bacchante-15-A9	Hybrid Gallica	1811	-	0.9326	0.0674	1
Cultivated	baron-de-wassenaer-16-E4	Moss	1854	-	0.52	0.48	1*
Cultivated	baron-j-b-gonella-7-A10	Bourbon	1859	-	0.1443	0.8557	2
Cultivated	baronne-de-noirmont-7-G12	Bourbon	1861	-	0.0207	0.9793	2
Cultivated	baronne-prevost-14-F10	Hybrid Perpetual	1842	-	0.0684	0.9316	2
Cultivated	beau-narcisse-8-F5	Hybrid Gallica	1828	-	0.5931	0.4069	1*
Cultivated	beaute-virginale-16-E9	Damask	1815	-	0.6591	0.3409	1*
Cultivated	belle-de-segur-16-D6	Alba	1826	-	0.5105	0.4895	1*
Cultivated	belle-de-yebles-9-F9	Hybrid Gallica	1835	-	0.9293	0.0707	1
Cultivated	belle-helene-15-B9	Hybrid Gallica	1815	-	0.9338	0.0662	1
Cultivated	belle-herminie-15-C9	Hybrid Gallica	1838	-	0.9329	0.0671	1
Cultivated	ombre-superbe-7-B12	Hybrid Gallica	1811	-	0.9327	0.0673	1
Cultivated	belle virginie-T1	Hybrid Gallica	1828	-	0.9326	0.0674	1
Cultivated	jacques-cartier-blanc-15-C5	Portland	1868	-	0.0254	0.9746	2
Cultivated	berenice-15-E4	Hybrid Gallica	1818	-	0.0236	0.9764	2
Cultivated	bernard-9-H6	Portland	1836	-	0.3785	0.6215	2*
Cultivated	bijou-des-amateurs-16-A5	Hybrid Gallica	1830	-	0.9327	0.0673	1
Cultivated	eugenie-de-guinoisseau-16-F1	Moss	1864	-	0.7047	0.2953	1*
Cultivated	blairii-n-1-7-C10	Bourbon	1844	-	0.0929	0.9071	2
Cultivated	blanc-de-vibert-15-E1	Portland	1847	-	0.619	0.381	1*
Cultivated	tri-littl	Unknown	Unknown	-	0.0272	0.9728	2
Cultivated	blanche-fleur-8-G12	Centifolia	1835	-	0.8069	0.1931	1
Cultivated	blomsterhult-9-F7	Hybrid Gallica	Unknown	-	0.3418	0.6582	2*
Cultivated	blush-damask-16-B12	Damask	1759	-	0.6692	0.3308	1*
Cultivated	blush-hip-16-A3	Alba	1834	-	0.0034	0.9966	2

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Cultivated	blush-noisette-15-E9	Noisette	1814	-	0.0011	0.9989	2
Cultivated	bon-silene-13-F5	Tea	1834	-	0.0011	0.9989	2
Cultivated	bougainville-15-A2	Noisette	1822	-	0.0011	0.9989	2
Cultivated	boula-de-nanteuil-15-F9	Hybrid Gallica	1834	-	0.0843	0.9157	2
Cultivated	bouquet-de-flore-8-G6	Bourbon	1833	-	0.0243	0.9757	2
Cultivated	bourbon-queen-8-E7	Bourbon	1834	-	0.2399	0.7601	2*
Cultivated	brennus-8-D12	Hybrid Gallica	1830	-	0.5951	0.4049	1*
Cultivated	burgundy-rose-16-C5	Hybrid Gallica	1664	-	0.0687	0.9313	2
Cultivated	camaieux-9-E11	Hybrid Gallica	1826	-	0.9327	0.0673	1
Cultivated	capitaine-john-ingram-16-D1	Hybrid Gallica	1854	-	0.9253	0.0747	1
Cultivated	catherine-guillot-8-A7	Bourbon	1860	-	0.0425	0.9575	2
Cultivated	celanire-8-G2	Alba	1824	-	0.6165	0.3835	1*
Cultivated	celestial-9-A12	Alba	1739	-	0.36	0.64	2*
Cultivated	celine-9-D11	Bourbon	1824	-	0.2	0.8	
Cultivated	celsiana-16-F5	Damask	1750	-	0.6628	0.3372	1*
Cultivated	charles-lawson-15-G9	Bourbon	1853	-	0.4935	0.5065	2*
Cultivated	chloris-14-F11	Alba	1815	-	0.001	0.999	2
Cultivated	cocarde-pale-15-F8	Hybrid Gallica	1813	-	0.071	0.929	2
Cultivated	commandant-beaurepaire-15-H9	Hybrid Perpetual	1864	-	0.5425	0.4575	1*
Cultivated	complicata-10-A2	Hybrid Gallica	1800	-	0.4267	0.5733	2*
Cultivated	comte-de-chambord-10-F2	Portland	1860	-	0.5841	0.4159	1*
Cultivated	comte-foy-de-rouen-10-C1	Hybrid Gallica	1827	-	0.9327	0.0673	1
Cultivated	comtesse-de-murinais-15-F1	Moss	1843	-	0.6191	0.3809	1*
Cultivated	coralie-16-B3	Moss	1828	-	0.9328	0.0672	1
Cultivated	cornet-7-A11	Damask	1845	-	0.5853	0.4147	1*
Cultivated	cosimo-ridolphi-15-A8	Hybrid Gallica	1842	-	0.9209	0.0791	1
Cultivated	coupe-d-hebe-16-G10	Bourbon	1840	-	0.0178	0.9822	2
Cultivated	cramoisi-des-alpes-15-E7	Hybrid Gallica	1829	-	0.9326	0.0674	1
Cultivated	cramoisi-picote-16-E6	Hybrid Gallica	1834	-	0.9332	0.0668	1
Cultivated	cramoisi-superieur-15-G7	China	1832	-	0.0011	0.9989	2
Cultivated	cuisse-de-nymphe-emue-15-A10	Alba	1811	-	0.6599	0.3401	1*
Cultivated	dalstorp-9-D7	Hybrid Gallica	Unknown	-	0.654	0.346	1*
Cultivated	daphne-15-C7	Hybrid Gallica	1819	-	0.9378	0.0622	1
Cultivated	darius-8-C3	Hybrid Gallica	1827	-	0.9327	0.0673	1
Cultivated	de-la-maitre-ecole-9-F3	Hybrid Gallica	1831	-	0.9326	0.0674	1
Cultivated	delambre-9-C10	Portland	1863	-	0.0711	0.9289	2
Cultivated	delille-15-F3	Moss	1852	-	0.3983	0.6017	2*
Cultivated	dembrowski-8-H6	Portland	1840	-	0.9297	0.0703	1
Cultivated	desiree-parmentier-7-G8	Hybrid Gallica	1841	-	0.8622	0.1378	1
Cultivated	di-abelc	Hybrid Tea	1894	-	0.0011	0.9989	2
Cultivated	di-coron	Unknown	Unknown	-	0.0011	0.9989	2
Cultivated	di-mvaum	Noisette	1875	-	0.001	0.999	2
Cultivated	di-parky	Unknown	Unknown	-	0.0565	0.9435	2
Cultivated	di-singl	China	Unknown	-	0.0011	0.9989	2
Cultivated	di-thefa	Polyantha	Unknown	-	0.0176	0.9824	2

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Cultivated	di-trann	Unknown	Unknown	-	0.0065	0.9935	2
Cultivated	dom-pedro-16-C3	Alba	1811	-	0.5081	0.4919	1*
Cultivated	dona-sol-15-B10	Hybrid Gallica	1842	-	0.9326	0.0674	1
Cultivated	double-white-16-G7	Hybrid Spinosissima	1808	-	0.0675	0.9325	2
Cultivated	duc-d-angouleme-15-H4	Centifolia	1821	-	0.5082	0.4918	1*
Cultivated	gonsalve-8-C2	Hybrid Gallica	1835	-	0.9326	0.0674	1
Cultivated	duc-de-crillon-16-H7	Bourbon	1860	-	0.0737	0.9263	2
Cultivated	duc-de-guiche-9-B3	Hybrid Gallica	1810	-	0.9327	0.0673	1
Cultivated	duchesse-d-angouleme-8-F12	Hybrid Gallica	1821	-	0.6992	0.3008	1*
Cultivated	duchesse-de-berry-15-C10	Hybrid Gallica	1818	-	0.9328	0.0672	1
Cultivated	duchesse-de-buccleugh-9-C1	Hybrid Gallica	1837	-	0.9327	0.0673	1
Cultivated	duchesse-de-montebello-15-D10	Hybrid Gallica	1824	-	0.9325	0.0675	1
Cultivated	duchesse-de-portland-14-G11	Portland	1775	-	0.6125	0.3875	1*
Cultivated	duchess-of-sutherland-14-D10	Hybrid Tea	1839	-	0.0087	0.9913	2
Cultivated	edith-de-murat-7-F11	Bourbon	1858	-	0.0011	0.9989	2
Cultivated	rosa-multiflora-carnea-15-E6	Botanic Species	1804	-	0.0262	0.9738	2
Cultivated	eulalie-lebrun-16-B8	Hybrid Gallica	1844	-	0.9326	0.0674	1
Cultivated	eveque-16-F6	Hybrid Gallica	1790	-	0.5965	0.4035	1*
Cultivated	felicite-parmentier-15-A5	Alba	1834	-	0.48	0.52	2*
Cultivated	pergolese-16-C12	Portland	1860	-	0.9326	0.0674	1
Cultivated	flocons-de-neige-9-B6	Polyantha	1898	-	0.0012	0.9988	2
Cultivated	flora-mac-ivor-16-F4	Hybrid Eglanteria	1895	-	0.0587	0.9413	2
Cultivated	foliacee-16-G1	Centifolia	1810	-	0.6985	0.3015	1*
Cultivated	frankfurt-9-C3	Hybrid Gallica	1583	-	0.5594	0.4406	1*
Cultivated	fulgens-gallique-15-H2	Hybrid Gallica	1828	-	0.5815	0.4185	1*
Cultivated	geant-des-batailles-14-A10	Hybrid Perpetual	1846	-	0.1178	0.8822	2
Cultivated	general-clerc-16-E3	Moss	1845	-	0.0041	0.9959	2
Cultivated	general-jacqueminot-14-C10	Hybrid Perpetual	1853	-	0.1085	0.8915	2
Cultivated	general-kleber-15-C3	Moss	1856	-	0.7701	0.2299	1*
Cultivated	geschwind-s-nordland-n-2-16-A11	Hybrid Setigera	1910	-	0.1841	0.8159	2
Cultivated	geschwind-s-nordlandrose-9-F11	Hybrid Setigera	1884	-	0.3536	0.6464	2*
Cultivated	geschwind-s-orden-9-H10	Hybrid Multiflora	1886	-	0.3204	0.6796	2*
Cultivated	geschwind-s-schonste-15-D3	Hybrid Multiflora	1900	-	0.0021	0.9979	2
Cultivated	gewoehnliche-moss-rose-16-F3	Moss	1696	-	0.4821	0.5179	2*
Cultivated	gourdault-8-F1	Bourbon	1859	-	0.0036	0.9964	2
Cultivated	grand-cramoisi-8-B2	Hybrid Gallica	1813	-	0.933	0.067	1
Cultivated	grande-cramoisi-10-D1	Hybrid Gallica	1813	-	0.9331	0.0669	1
Cultivated	pourpre-charmant-15-B8	Hybrid Gallica	1811	-	0.9307	0.0693	1
Cultivated	hap-hob	Unknown	Unknown	-	0.0011	0.9989	2
Cultivated	heroine-de-vaucluse-9-H7	Hybrid Gallica	1863	-	0.4231	0.5769	2*
Cultivated	hume-s-blush-tea-scented-china-14-D12	Tea	1809	-	0.001	0.999	2
Cultivated	imperatrice-josephine-15-E10	Hybrid Gallica	1789	-	0.6984	0.3016	1*
Cultivated	indigo-14-B12	Portland	1830	-	0.8861	0.1139	1
Cultivated	jacques-cartier-10-G2	Portland	1868	-	0.5849	0.4151	1*
Cultivated	jenny-duval-15-G10	Hybrid Gallica	1842	-	0.9471	0.0529	1

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Cultivated	jeune-henry-16-G5	Portland	1815	-	0.2143	0.7857	2*
Cultivated	josephine-ritter-15-A4	Hybrid Multiflora	1900	-	0.5922	0.4078	1*
Cultivated	jules-margottin-15-E3	Hybrid Perpetual	1852	-	0.4886	0.5114	2*
Cultivated	julie-krudner-15-D12	Portland	1847	-	0.8758	0.1242	1
Cultivated	Konigin-von-Danemark-16-G3	Alba	1816	-	0.0279	0.9721	2
Cultivated	la-belle-sultane-15-G3	Hybrid Gallica	1795	-	0.9329	0.0671	1
Cultivated	la-france-15-C2	Hybrid Tea	1867	-	0.0121	0.9879	2
Cultivated	la-maculee-9-H2	Hybrid Gallica	1810	-	0.9329	0.0671	1
Cultivated	la-noblesse-14-C12	Centifolia	1857	-	0.3825	0.6175	2*
Cultivated	l-ardoisee-9-D1	Hybrid Gallica	1811	-	0.9327	0.0673	1
Cultivated	la-reine-15-H1	Hybrid Perpetual	1842	-	0.4232	0.5768	2*
Cultivated	la-rubanee-15-A1	Hybrid Gallica	1839	-	0.0684	0.9316	2
Cultivated	las-casas-9-A10	Bourbon	1828	-	0.0052	0.9948	2
Cultivated	lea-15-H10	Hybrid Gallica	1825	-	0.6016	0.3984	1*
Cultivated	leda-8-B12	Damask	1827	-	0.7207	0.2793	1*
Cultivated	le-loberde-7-H10	Moss	1800	-	0.8505	0.1495	1
Cultivated	le-rire-niais-9-H1	Centifolia	1810	-	0.9329	0.0671	1
Cultivated	manette-8-G5	Hybrid Gallica	1820	-	0.0745	0.9255	2
Cultivated	les-saisons-d-italie-7-H11	Hybrid Gallica	1801	-	0.4361	0.5639	2*
Cultivated	lycoris-9-B2	Hybrid Gallica	1835	-	0.9327	0.0673	1
Cultivated	maiden-s-blush-16-G6	Alba	1797	-	0.6549	0.3451	1*
Cultivated	mannings-blush-9-E12	Botanic Species	1799	-	0.0723	0.9277	2
Cultivated	marie-de-saint-jean-8-H7	Portland	1869	-	0.9233	0.0767	1
Cultivated	marietta-silva-tarouca-15-B4	Hybrid Multiflora	1925	-	0.001	0.999	2
Cultivated	marie-louise-9-A2	Damask	< 1813	-	0.9327	0.0673	1
Cultivated	meteor-16-G4	Noisette	1887	-	0.0083	0.9917	2
Cultivated	mignonne-charmante-8-B1	Moss	1814	-	0.5392	0.4608	1*
Cultivated	minette-9-D10	Centifolia	1819	-	0.2868	0.7132	2*
Cultivated	mle-blanche-lafitte-8-G1	Bourbon	1851	-	0.001	0.999	2
Cultivated	mme-hardy-9-C11	Damask	1832	-	0.6491	0.3509	1*
Cultivated	mme-nerard-16-D8	Bourbon	1838	-	0.002	0.998	2
Cultivated	mogador-15-E5	Portland	1819	-	0.001	0.999	2
Cultivated	moise-15-F5	Hybrid Gallica	1828	-	0.7822	0.2178	1*
Cultivated	napoleon-8-C1	Hybrid Gallica	1790	-	0.9331	0.0669	1
Cultivated	niphetos-14-E10	Tea	1835	-	0.1734	0.8266	2
Cultivated	nouveau-monde-8-A1	Hybrid Gallica	1811	-	0.6265	0.3735	1*
Cultivated	nouveau-rouge-10-D3	Hybrid Gallica	1811	-	0.9326	0.0674	1
Cultivated	nouvelle-transparente-9-D9	Hybrid Gallica	1835	-	0.8347	0.1653	1
Cultivated	nuits-de-young-16-H1	Moss	1845	-	0.002	0.998	2
Cultivated	tetra-oeill	Damask	1835	-	0.8959	0.1041	1
Cultivated	oeillet-double-16-H5	Hybrid Gallica	1829	-	0.9329	0.0671	1
Cultivated	omer-pacha-16-A10	Bourbon	1863	-	0.0057	0.9943	2
Cultivated	paeonienrose-10-H3	Hybrid Gallica	1845	-	0.8843	0.1157	1
Cultivated	parure-des-vierges-8-E1	Hybrid Gallica	1801	-	0.5496	0.4504	1*
Cultivated	petite-ecossaise-15-G1	Hybrid Spinosissima	1826	-	0.0678	0.9322	2

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Cultivated	petite-lisette-15-G5	Alba	1817	-	0.7028	0.2972	1*
Cultivated	pierre-de-saint-cyr-8-D5	Bourbon	1838	-	0.002	0.998	2
Cultivated	poesie-9-A6	Hybrid Musk	1982	-	0.0012	0.9988	2
Cultivated	pompon-panache-15-D2	Hybrid Gallica	1857	-	0.9244	0.0756	1
Cultivated	prince-albert-16-F8	Bourbon	1852	-	0.0123	0.9877	2
Cultivated	princesse-louise-16-B5	Hybrid Sempervirens	1829	-	0.0403	0.9597	2
Cultivated	princesse-marie-9-B10	Hybrid Sempervirens	1829	-	0.1747	0.8253	2
Cultivated	princesse-royale-16-B4	Moss	1846	-	0.0023	0.9977	2
Cultivated	rosa-stylosa-7-C9	Botanic Species	Botanic	-	0.0701	0.9299	2
Cultivated	provins-marbre-15-C8	Hybrid Gallica	1819	-	0.9326	0.0674	1
Cultivated	provins-renoncule-15-E11	Hybrid Gallica	1810	-	0.9409	0.0591	1
Cultivated	reine-des-centfeuilles-14-F12	Centifolia	1824	-	0.5709	0.4291	1*
Cultivated	reine-des-mousseuses-16-C4	Moss	1860	-	0.9329	0.0671	1
Cultivated	reverend-h-d-ombrain-8-E2	Bourbon	1863	-	0.6006	0.3994	1*
Cultivated	roi-de-siam-15-C1	Tea	1825	-	0.0414	0.9586	2
Cultivated	roi-des-pays-bas-16-A6	Damask	1824	-	0.3378	0.6622	2*
Cultivated	rosa-andersonii-15-C4	Inter Species	1912	-	0.579	0.421	1*
Cultivated	rosa-anemonae-9-B12	Hybrid Gallica	1814	-	0.0682	0.9318	2
Cultivated	rosa-atropurpurea-15-H5	Hybrid Gallica	1786	-	0.4387	0.5613	2*
Cultivated	rosa-brunonii-10-H1	Botanic Species	Botanic	-	0.021	0.979	2
Cultivated	rosa-burgundiaca-8-F8	Centifolia	1664	-	0.0713	0.9287	2
Cultivated	rosa-centifolia-cristata-15-F6	Centifolia	1824	-	0.6703	0.3297	1*
Cultivated	rosa-centifolia-major-9-C9	Centifolia	1597	-	0.5485	0.4515	1*
Cultivated	rosa-centifolia-parvifolia-8-B7	Hybrid Gallica	1664	-	0.9327	0.0673	1
Cultivated	rosa-centifolia-variegata-8-H4	Centifolia	1817	-	0.5937	0.4063	1*
Cultivated	rosa-cinnamomae-rugosa-7-D9	Botanic Species	Botanic	-	0.068	0.932	2
Cultivated	rosa-complicata-8-A9	Hybrid Gallica	Botanic	-	0.432	0.568	2*
Cultivated	rosa-dupontii-8-H9	Inter Species	1817	-	0.5582	0.4418	1*
Cultivated	rosa-francofurtana-9-D12	Botanic Species	1774	-	0.0679	0.9321	2
Cultivated	rosa-gallica-15-B6	Botanic Species	Botanic	-	0.9376	0.0624	1
Cultivated	rosa-gallica-8-G7	Botanic Species	Botanic	-	0.9402	0.0598	1
Cultivated	rosa-gallica-caucasica-8-D8	Hybrid Gallica	Botanic	-	0.0731	0.9269	2
Cultivated	rosa-gallica-conditorum-8-E10	Hybrid Gallica	Botanic	-	0.4775	0.5225	2*
Cultivated	rosa-gallica-forme-d-epire-10-A3	Hybrid Gallica	Unknown	-	0.9967	0.0033	1
Cultivated	rosa-gallica-grandiflora-15-C6	Hybrid Gallica	1797	-	0.1707	0.8293	2
Cultivated	rosa-gallica-huilii-9-G3	Hybrid Gallica	Botanic	-	0.927	0.073	1
Cultivated	rosa-gallica-incarnata-8-G11	Hybrid Gallica	Botanic	-	0.9976	0.0024	1
Cultivated	rosa-gallica-poumi-8-D6	Hybrid Gallica	Unknown	-	0.6198	0.3802	1*
Cultivated	rosa-gallica-pumila-8-E9	Hybrid Gallica	1789	-	0.9988	0.0012	1
Cultivated	rosa-gallica-tricolore-16-C7	Hybrid Gallica	1827	-	0.9318	0.0682	1
Cultivated	rosa-gallica-velutinaeflora-8-E5	Botanic Species	1850	-	0.9979	0.0021	1
Cultivated	rosa-gallica-wallonic-8-F9	Hybrid Gallica	Botanic	-	0.2418	0.7582	2*
Cultivated	rosa-hemisphaerica-15-G12	Botanic Species	1516	-	0.0723	0.9277	2
Cultivated	rosa-hypathea-15-H11	Centifolia	1843	-	0.0774	0.9226	2
Cultivated	rosa-iwara-14-H9	Hybrid Multiflora	1830	-	0.0365	0.9635	2

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Cultivated	rosa-macrantha-8-C9	Hybrid Gallica	Botanic	-	0.7763	0.2237	1*
Cultivated	rosa-majalis-plena-16-E12	Inter Species	1583	-	0.0675	0.9325	2
Cultivated	rosa-micrantha-sepium-8-A10	Botanic Species	1800	-	0.0703	0.9297	2
Cultivated	rosa-moschata-la-mosquenton-7-C8	Botanic Species	Unknown	-	0.0814	0.9186	2
Cultivated	rosa-moschata-umbrella-7-B8	Botanic Species	1912	-	0.0011	0.9989	2
Cultivated	rosa-moschata-yamada-7-D8	Botanic Species	Unknown	-	0.3763	0.6237	2*
Cultivated	rosa-mundi-selfcoloured-16-D7	Hybrid Gallica	1759	-	0.9326	0.0674	1
Cultivated	rosa-muscipula-8-F7	Hybrid Gallica	Botanic	-	0.9964	0.0036	1
Cultivated	rosa-muscosa-japonica-9-B9	Moss	Botanic	-	0.3768	0.6232	2*
Cultivated	rosa-odorata-spontanea-16-E5	Inter Species	Botanic	-	0.0016	0.9984	2
Cultivated	rosa-odorata-sweet-var-odorata-9-E8	Inter Species	1808	-	0.0386	0.9614	2
Cultivated	rosa-pendulina-plena-8-F6	Boursault	1883	-	0.0167	0.9833	2
Cultivated	rosa-pomifera-16-H8	Botanic Species	1770	-	0.0747	0.9253	2
Cultivated	rosa-prolifera-16-A9	Hybrid Gallica	1817	-	0.3953	0.6047	2*
Cultivated	rosa-proliferea-10-C2	Centifolia	1817	-	0.9578	0.0422	1
Cultivated	rosa-simianjing-9-C8	Inter Species	Unknown	-	0.0044	0.9956	2
Cultivated	rosa-sublaevis-9-H8	Inter Species	Botanic	-	0.9588	0.0412	1
Cultivated	rosa-sulphurea-9-A9	Botanic Species	1516	-	0.0673	0.9327	2
Cultivated	rosa-sylvatica-8-C8	Inter Species	1826	-	0.9499	0.0501	1
Cultivated	rosa-villosa-recondita-7-A9	Botanic Species	1771	-	0.7967	0.2033	1*
Cultivated	rosa-yunzheng-xiawei-9-D8	Inter Species	Unknown	-	0.0046	0.9954	2
Cultivated	rose-de-provins-16-E7	Botanic Species	1240	-	0.9329	0.0671	1
Cultivated	rose-de-rescht-8-C4	Portland	1880	-	0.6791	0.3209	1*
Cultivated	rose-edouard-13-E5	Bourbon	1819	-	0.7553	0.2447	1*
Cultivated	rose-edouard-8-D7	Bourbon	1819	-	0.0255	0.9745	2
Cultivated	rotrou-16-D4	Moss	1849	-	0.0013	0.9987	2
Cultivated	rouge-marbree-8-H1	Bourbon	1863	-	0.4299	0.5701	2*
Cultivated	roxelane-16-C10	Hybrid China	1824	-	0.6418	0.3582	1*
Cultivated	sidonie-8-C7	Hybrid Perpetual	1845	-	0.5165	0.4835	1*
Cultivated	sir-joseph-paxton-15-F2	Bourbon	1852	-	0.0675	0.9325	2
Cultivated	solbakkens-9-G7	Moss	Unknown	-	0.4498	0.5502	2*
Cultivated	soleil-brillant-10-B3	Hybrid Gallica	1783	-	0.9329	0.0671	1
Cultivated	spencer-8-E12	Hybrid Perpetual	1892	-	0.681	0.319	1*
Cultivated	surpasse-tout-10-A1	Hybrid Gallica	1811	-	0.9328	0.0672	1
Cultivated	tetra-black	Hybrid Tea	Unknown	-	0.0011	0.9989	2
Cultivated	tetra-conra	Hybrid Rugosa	1897	-	0.0119	0.9881	2
Cultivated	tetra-inabi	Hybrid Perpetual	1906	-	0.0137	0.9863	2
Cultivated	tetra-janet	Hybrid Eglanteria	1894	-	0.9507	0.0493	1
Cultivated	tetra-meivh	Unknown	Unknown	-	0.0015	0.9985	2
Cultivated	tetra-nilbl	Hybrid Tea	Unknown	-	0.0011	0.9989	2
Cultivated	tetra-pault	Hybrid Wichurana	1900	-	0.0444	0.9556	2
Cultivated	tetra-rfed	Botanic Species	1871	-	0.0684	0.9316	2
Cultivated	tetra-robus	Bourbon	Unknown	-	0.001	0.999	2
Cultivated	tetra-sonia	Unknown	Unknown	-	0.1004	0.8996	2
Cultivated	tetra-tiffa	Unknown	Unknown	-	0.0082	0.9918	2

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Cultivated	tetra-virgi	Unknown	Unknown	-	0.4563	0.5437	2*
Cultivated	the-garland-9-C6	Hybrid Multiflora	1835	-	0.0015	0.9985	2
Cultivated	the-portland-rose-16-H11	Portland	1775	-	0.8191	0.1809	1
Cultivated	toussaint-l-ouverture-15-A12	Bourbon	1849	-	0.903	0.097	1
Cultivated	tricolore-9-E3	Hybrid Gallica	1827	-	0.9309	0.0691	1
Cultivated	triomphe-de-l-exposition-16-F12	Hybrid Perpetual	1855	-	0.4351	0.5649	2*
Cultivated	unique-de-provence-15-A7	Centifolia	1775	-	0.8631	0.1369	1
Cultivated	unique-panachee-7-B10	Centifolia	1821	-	0.6114	0.3886	1*
Cultivated	van-huyssum-16-D10	Damask	1732	-	0.689	0.311	1*
Cultivated	veloute-d-orleans-7-E12	Bourbon	1852	-	0.0374	0.9626	2
Cultivated	venusta-pendula-15-H3	Ayrshire	1776	-	0.3506	0.6494	2*
Cultivated	vicomtesse-d-avesne-16-E10	Noisette	1847	-	0.0029	0.9971	2
Cultivated	williams-double-yellow-14-B10	Hybrid Foetida	1828	-	0.0683	0.9317	2
Cultivated	yolande-d-aragon-7-G9	Portland	1843	-	0.5973	0.4027	1*
Other sp.	tetra-ow9001-ow9007	Tetrasynthetique	-	-	0.001	0.999	2
Other sp.	pharma-provins-7	Rosier de Provins	-	-	0.6572	0.3428	1*
Other sp.	1-VERNAS-1	Rosa micrantha	-	-	0.2233	0.7767	2*
Other sp.	4-zala-HON-5	Rosa zalana Wiesb. var. zempleniensis	-	-	0.069	0.931	2
Other sp.	10-pomz-HON-9	Rosa zalana Wiesb.	-	-	0.0732	0.9268	2
Other sp.	XAN-05	Rosa xanthina Lindl.	-	-	0.1047	0.8953	2
Other sp.	10-pomz-HON-1	Rosa x pomazensis	-	-	0.1985	0.8015	2
Other sp.	10-pomz-HON-3	Rosa x pomazensis	-	-	0.2573	0.7427	2*
Other sp.	4-pomz-HON-2	Rosa x pomazensis	-	-	0.2473	0.7527	2*
Other sp.	1-perv-VIRAZEIL-7	Rosa x pervirens	-	-	0.2291	0.7709	2*
Other sp.	NIX-01	Rosa x nitidula Besser	-	-	0.0693	0.9307	2
Other sp.	duma-1	Rosa x dumalis Bechst.	-	-	0.4583	0.5417	2*
Other sp.	CEX-01	Rosa x centifolia L. var. muscosa	-	-	0.6271	0.3729	1*
Other sp.	11-cent-HON-1-C	Rosa x centifolia L.	-	-	0.4717	0.5283	2*
Other sp.	cent-3	Rosa x centifolia L.	-	-	0.3478	0.6522	2*
Other sp.	1-alb-SUI-1	Rosa x alba L.	-	-	0.4061	0.5939	2*
Other sp.	WIC-03	Rosa wichurana var. wichurana	-	-	0.0139	0.9861	2
Other sp.	WIC-04	Rosa wichurana var. poteriifolia	-	-	0.0283	0.9717	2
Other sp.	VIR-02	Rosa virginiana Mill.	-	-	0.0669	0.9331	2
Other sp.	1-vil-SLO-1	Rosa villosa L. hyb.	-	-	0.0674	0.9326	2
Other sp.	1-vil-SLO-2	Rosa villosa L.	-	-	0.0675	0.9325	2
Other sp.	VIL-01	Rosa villosa L.	-	-	0.0721	0.9279	2
Other sp.	di-rodo	Rosa var odorata gigantea	-	-	0.002	0.998	2
Other sp.	TOA-02	Rosa tomentosa Sm.	-	-	0.0683	0.9317	2
Other sp.	TOM-02	Rosa tomentella	-	-	0.0781	0.9219	2
Other sp.	PIM-03	Rosa spinosissima L.	-	-	0.0672	0.9328	2
Other sp.	1-spi-SLO-6	Rosa spinosissima L.	-	-	0.0719	0.9281	2
Other sp.	SPI-05	Rosa spinosissima L.	-	-	0.0674	0.9326	2
Other sp.	SEP-04	Rosa setipoda Hemsl. & Wils.	-	-	0.0682	0.9318	2
Other sp.	di-rseg	Rosa setigera	-	-	0.0731	0.9269	2
Other sp.	SEF-01	Rosa serafinii Viv.	-	-	0.0693	0.9307	2

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Other sp.	1-sem-AURIEBAT-1	Rosa sempervirens L.	-	-	0.6469	0.3531	1*
Other sp.	1-semp-SAVIGNAC-1	Rosa sempervirens L.	-	-	0.4994	0.5006	2*
Other sp.	1-sem-SLO-10	Rosa sempervirens L.	-	-	0.5189	0.4811	1*
Other sp.	SEM-01	Rosa sempervirens L.	-	-	0.1146	0.8854	2
Other sp.	di-rsem	Rosa sempervirens	-	-	0.0997	0.9003	2
Other sp.	1-sectcan-BEAUCOUZE-1	Rosa sect. Caninae	-	-	0.081	0.919	2
Other sp.	1-sectcan-LAMARQUE-4	Rosa sect Caninae grp Agrestis	-	-	0.0711	0.9289	2
Other sp.	RUS-01	Rosa ruscinonensis	-	-	0.1257	0.8743	2
Other sp.	RUG-01	Rosa rugosa Thunb.	-	-	0.0673	0.9327	2
Other sp.	RUG-02	Rosa rugosa Thunb.	-	-	0.002	0.998	2
Other sp.	di-rrug	Rosa rugosa	-	-	0.0674	0.9326	2
Other sp.	1-rubig-HON-1	Rosa rubiginosa L. sensu stricto	-	-	0.0685	0.9315	2
Other sp.	1-rubig-FERRIERE-1	Rosa rubiginosa L.	-	-	0.0685	0.9315	2
Other sp.	di-rrox	Rosa roxburghii	-	-	0.0701	0.9299	2
Other sp.	1-SAINT-CIRQ-18	Rosa ressemblant gallica	-	-	0.7185	0.2815	1*
Other sp.	PRI-03	Rosa primula Boulenger	-	-	0.0684	0.9316	2
Other sp.	PHO-02	Rosa phoenicea Boiss.	-	-	0.9809	0.0191	1
Other sp.	di-rper	Rosa persica	-	-	0.0675	0.9325	2
Other sp.	1-pend-SLO-5	Rosa pendulina L.	-	-	0.0687	0.9313	2
Other sp.	PEN-03	Rosa pendulina L.	-	-	0.0703	0.9297	2
Other sp.	OXY-01	Rosa oxyodon Boiss.	-	-	0.0667	0.9333	2
Other sp.	NAN-01	Rosa nanothamnus var. litvinovi	-	-	0.0684	0.9316	2
Other sp.	MUA-01	Rosa multiflora Thunb.	-	-	0.0011	0.9989	2
Other sp.	di-coule	Rosa multiflora	-	-	0.0085	0.9915	2
Other sp.	di-guyon	Rosa multiflora	-	-	0.0017	0.9983	2
Other sp.	di-oriot	Rosa multiflora	-	-	0.0011	0.9989	2
Other sp.	di-pelle	Rosa multiflora	-	-	0.0011	0.9989	2
Other sp.	di-pgabe	Rosa multiflora	-	-	0.0022	0.9978	2
Other sp.	MOS-01	Rosa moschata Herrm.	-	-	0.0751	0.9249	2
Other sp.	MOS-02	Rosa moschata Herrm.	-	-	0.0013	0.9987	2
Other sp.	di-rmos	Rosa moschata	-	-	0.0629	0.9371	2
Other sp.	MOL-01	Rosa mollis Sm.	-	-	0.0684	0.9316	2
Other sp.	MIC-01	Rosa micrantha Borrer ex Sm.	-	-	0.0726	0.9274	2
Other sp.	MAX-01	Rosa maximowicziana	-	-	0.2197	0.7803	2*
Other sp.	MAI-02	Rosa marretii	-	-	0.0671	0.9329	2
Other sp.	MAR-02	Rosa marginata Wallr.	-	-	0.0685	0.9315	2
Other sp.	MAJ-01	Rosa majalis Herrm.	-	-	0.0684	0.9316	2
Other sp.	MAJ-02	Rosa majalis Herrm.	-	-	0.0675	0.9325	2
Other sp.	MAJ-04	Rosa majalis Herrm.	-	-	0.0675	0.9325	2
Other sp.	di-rmaj	Rosa majalis	-	-	0.0675	0.9325	2
Other sp.	MAC-03	Rosa macrophylla Lindl.	-	-	0.0737	0.9263	2
Other sp.	tetra-rmac	Rosa macrophylla	-	-	0.0677	0.9323	2
Other sp.	LUC-01	Rosa luciae	-	-	0.0353	0.9647	2
Other sp.	LON-03	Rosa longicuspis Bertol.	-	-	0.0387	0.9613	2
Other sp.	di-rlae	Rosa laevigata	-	-	0.0648	0.9352	2

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Other sp.	10-jun-HON-11	Rosa jundzillii Besser	-	-	0.3015	0.6985	2*
Other sp.	4-jun-HON-6	Rosa jundzillii Besser	-	-	0.2713	0.7287	2*
Other sp.	JUN-01	Rosa jundzillii Besser	-	-	0.213	0.787	2*
Other sp.	INO-01	Rosa inodora Fr.	-	-	0.0694	0.9306	2
Other sp.	HUG-01	Rosa hugonis Hemsl.	-	-	0.0676	0.9324	2
Other sp.	di-rgym	Rosa gymnocarpa	-	-	0.0693	0.9307	2
Other sp.	di-rglo	Rosa glomerata	-	-	0.2861	0.7139	2*
Other sp.	1-gla-SLO-4	Rosa glauca Pourr.	-	-	0.0741	0.9259	2
Other sp.	2-gla-SLO-1	Rosa glauca Pourr.	-	-	0.0744	0.9256	2
Other sp.	2-gla-SLO-2	Rosa glauca Pourr.	-	-	0.0685	0.9315	2
Other sp.	2-gla-SLO-4	Rosa glauca Pourr.	-	-	0.0739	0.9261	2
Other sp.	S-1-TOMBEBOEUF-5	Rosa gallica x syns.	-	-	0.948	0.052	1
Other sp.	S-5-HON-5	Rosa gallica var. czackiana	-	-	0.9944	0.0056	1
Other sp.	Sgal-Rosa-gallica-officinalis-1	Rosa gallica var officinalis	-	-	0.9555	0.0445	1
Other sp.	di-rfor	Rosa forrestiana	-	-	0.1286	0.8714	2
Other sp.	FED-01	Rosa fedtschenkoana Regl.	-	-	0.0675	0.9325	2
Other sp.	ELI-01	Rosa elliptica Tausch	-	-	0.0691	0.9309	2
Other sp.	penta-rdum	Rosa dumalis	-	-	0.0684	0.9316	2
Other sp.	rescht-1	Rosa de Rescht	-	-	0.9456	0.0544	1
Other sp.	DAC-01	Rosa davurica Pall.	-	-	0.0767	0.9233	2
Other sp.	DAM-02	Rosa damascena L.	-	-	0.6273	0.3727	1*
Other sp.	COL-01	Rosa columnifera	-	-	0.0684	0.9316	2
Other sp.	di-rchi	Rosa chinensis spontanea	-	-	0.0155	0.9845	2
Other sp.	cent-2	Rosa centifolia	-	-	0.7137	0.2863	1*
Other sp.	CAR-03	Rosa carolina L.	-	-	0.0666	0.9334	2
Other sp.	di-rcar	Rosa carolina	-	-	0.0693	0.9307	2
Other sp.	CAN-01	Rosa canina L.	-	-	0.0682	0.9318	2
Other sp.	CAN-06	Rosa canina L.	-	-	0.0045	0.9955	2
Other sp.	CAN-07	Rosa canina L.	-	-	0.0757	0.9243	2
Other sp.	BEL-01	Rosa bella Rehder & Wilson	-	-	0.0693	0.9307	2
Other sp.	BEG-01	Rosa beggeriana Schrenk	-	-	0.0684	0.9316	2
Other sp.	BAN-03	Rosa banksiae Ait.	-	-	0.0831	0.9169	2
Other sp.	pervirens-6	Rosa arvensis x sempervirens	-	-	0.9107	0.0893	1
Other sp.	1-arvhyb-SLO-4	Rosa arvensis x glauca ou villosa	-	-	0.0675	0.9325	2
Other sp.	1-arv-TEMPLE-5	Rosa arvensis L.	-	-	0.8113	0.1887	1
Other sp.	1-arv-SLO-7	Rosa arvensis Huds.	-	-	0.822	0.178	1
Other sp.	arvensis-5	Rosa arvensis Huds.	-	-	0.9977	0.0023	1
Other sp.	di-rarv	Rosa arvensis	-	-	0.5854	0.4146	1*
Other sp.	ALB-02	Rosa albertii Regel	-	-	0.0674	0.9326	2
Other sp.	hexa-ralb	Rosa alba	-	-	0.0693	0.9307	2
Other sp.	AGR-02	Rosa agrestis Savi	-	-	0.0685	0.9315	2
Other sp.	AGR-03	Rosa agrestis Savi	-	-	0.0693	0.9307	2
Other sp.	ABY-01	Rosa abyssinica Lindl.	-	-	0.0667	0.9333	2
Other sp.	ABI-01	Rosa abietina Gren. ex H.Christ	-	-	0.0754	0.9246	2
Other sp.	di-hwic	H de Rosa wichurana	-	-	0.002	0.998	2

Category	ID individual	Species / Horticultural Group	Year	Country	MP Cluster 1	MP cluster 2	Cluster
Other sp.	di-ow9001-pf-ob-hwic	Descendance OW	-	-	0.0011	0.9989	2
Other sp.	di-ow9004-pf-ob-hwic	Descendance OW	-	-	0.001	0.999	2
Other sp.	di-ow9005-pf-ob-hwic	Descendance OW	-	-	0.0011	0.9989	2
Other sp.	di-ow9006-pf-ob-hwic	Descendance OW	-	-	0.001	0.999	2
Other sp.	di-ow9007-pf-ob-hwic	Descendance OW	-	-	0.0011	0.9989	2
Other sp.	di-ow9008-pf-ob-hwic	Descendance OW	-	-	0.0013	0.9987	2
Other sp.	di-ow9010-pf-ob-hwic	Descendance OW	-	-	0.002	0.998	2
Other sp.	di-ow9011-pf-ob-hwic	Descendance OW	-	-	0.001	0.999	2
Other sp.	di-ow9012-pf-ob-hwic	Descendance OW	-	-	0.0011	0.9989	2
Other sp.	di-ow9034-pf-ob-hwic	Descendance OW	-	-	0.0018	0.9982	2

Appendix 3. STRUCTURE results of the subdivision of General Cluster 1. Genotypes were assigned to the most probable cluster MP > 0.5. Admixed individuals are marked with *.

Category	ID Individual	Species / Horticultural Group	YEAR	Country	MP cluster 1.1	MP cluster 1.2	Cluster
Cultivated	abrahamsgarden-9-A8	Hybrid Gallica	Unknown	-	0.004	0.996	1.2
Cultivated	adele-7-C12	Hybrid Gallica	1814	-	0.0039	0.9961	1.2
Cultivated	adele-heu-10-A4	Hybrid Gallica	1816	-	0.0032	0.9968	1.2
Cultivated	adele-pavie-16-G2	Moss	1850	-	0.002	0.998	1.2
Cultivated	adele-prevost-9-E2	Hybrid Gallica	1830	-	0.004	0.996	1.2
Cultivated	agar-16-H4	Hybrid Gallica	1843	-	0.0021	0.9979	1.2
Cultivated	agatha-16-B6	Hybrid Gallica	1817	-	0.002	0.998	1.2
Cultivated	agathe-fatime-9-B1	Hybrid Gallica	1815	-	0.003	0.997	1.2
Cultivated	aimable-amie-9-G2	Hybrid Gallica	1818	-	0.0153	0.9847	1.2
Cultivated	alain-blanchard-7-F9	Hybrid Gallica	1839	-	0.1443	0.8557	1.2
Cultivated	alector-cramoisi-15-H7	Hybrid Gallica	1811	-	0.002	0.998	1.2
Cultivated	ambroise-pare-16-C6	Hybrid Gallica	1846	-	0.003	0.997	1.2
Cultivated	amelie-de-mansfield-16-G8	Hybrid Gallica	1823	-	0.0041	0.9959	1.2
Cultivated	incomparable-d-auteuil-10-E1	Centifolia	1828	-	0.0162	0.9838	1.2
Cultivated	angelique-quetier-14-G10	Moss	1839	-	0.006	0.994	1.2
Cultivated	antonia-d-ormois-15-B5	Hybrid Gallica	1835	-	0.0993	0.9007	1.2
Cultivated	ariadne-8-C10	Hybrid Gallica	1818	-	0.0187	0.9813	1.2
Cultivated	aristobule-16-B1	Moss	1849	-	0.003	0.997	1.2
Cultivated	armide-8-A11	Alba	1817	-	0.0147	0.9853	1.2
Cultivated	bacchante-15-A9	Hybrid Gallica	1811	-	0.003	0.997	1.2
Cultivated	baron-de-wassenaer-16-E4	Moss	1854	-	0.002	0.998	1.2
Cultivated	beau-narcisse-8-F5	Hybrid Gallica	1828	-	0.0032	0.9968	1.2
Cultivated	beaute-virginale-16-E9	Damask	1815	-	0.1573	0.8427	1.2
Cultivated	belle-de-segur-16-D6	Alba	1826	-	0.05	0.95	1.2
Cultivated	belle-de-yebles-9-F9	Hybrid Gallica	1835	-	0.0302	0.9698	1.2
Cultivated	belle-helene-15-B9	Hybrid Gallica	1815	-	0.0131	0.9869	1.2
Cultivated	belle-herminie-15-C9	Hybrid Gallica	1838	-	0.0041	0.9959	1.2
Cultivated	ombre-superbe-7-B12	Hybrid Gallica	1811	-	0.0039	0.9961	1.2
Cultivated	bellevirginie-T1	Hybrid Gallica	Unknown	-	0.003	0.997	1.2
Cultivated	bijou-des-amateurs-16-A5	Hybrid Gallica	1830	-	0.005	0.995	1.2

Category	ID Individual	Species / Horticultural Group	YEAR	Country	MP cluster 1.1	MP cluster 1.2	Cluster
Cultivated	eugenie-de-guinoisseau-16-F1	Moss	1864	-	0.0026	0.9974	1.2
Cultivated	blanc-de-vibert-15-E1	Portland	1847	-	0.0193	0.9807	1.2
Cultivated	blanche-fleur-8-G12	Centifolia	1835	-	0.0243	0.9757	1.2
Cultivated	blush-damask-16-B12	Damask	1759	-	0.5483	0.4517	1.1*
Cultivated	brennus-8-D12	Hybrid Gallica	1830	-	0.0038	0.9962	1.2
Cultivated	camaieux-9-E11	Hybrid Gallica	1826	-	0.004	0.996	1.2
Cultivated	capitaine-john-ingram-16-D1	Hybrid Gallica	1854	-	0.003	0.997	1.2
Cultivated	celanire-8-G2	Alba	1824	-	0.0079	0.9921	1.2
Cultivated	celsiana-16-F5	Damask	1750	-	0.0105	0.9895	1.2
Cultivated	commandant-beaurepaire-15-H9	Hybrid Perpetual	1864	-	0.002	0.998	1.2
Cultivated	comte-de-chambord-10-F2	Portland	1860	-	0.003	0.997	1.2
Cultivated	comte-foy-de-rouen-10-C1	Hybrid Gallica	1827	-	0.004	0.996	1.2
Cultivated	comtesse-de-murinais-15-F1	Moss	1843	-	0.005	0.995	1.2
Cultivated	coralie-16-B3	Moss	1828	-	0.0067	0.9933	1.2
Cultivated	cornet-7-A11	Damask	1845	-	0.0022	0.9978	1.2
Cultivated	cosimo-ridolphi-15-A8	Hybrid Gallica	1842	-	0.002	0.998	1.2
Cultivated	cramoisi-des-alpes-15-E7	Hybrid Gallica	1829	-	0.003	0.997	1.2
Cultivated	cramoisi-picote-16-E6	Hybrid Gallica	1834	-	0.012	0.988	1.2
Cultivated	cuisse-de-nymphe-emue-15-A10	Alba	1811	-	0.2455	0.7545	1.2*
Cultivated	dalstorp-9-D7	Hybrid Gallica	Unknown	-	0.002	0.998	1.2
Cultivated	daphne-15-C7	Hybrid Gallica	1819	-	0.0389	0.9611	1.2
Cultivated	darius-8-C3	Hybrid Gallica	1827	-	0.003	0.997	1.2
Cultivated	de-la-maitre-ecole-9-F3	Hybrid Gallica	1831	-	0.003	0.997	1.2
Cultivated	dembrowski-8-H6	Portland	1840	-	0.0114	0.9886	1.2
Cultivated	desiree-parmentier-7-G8	Hybrid Gallica	1841	-	0.0153	0.9847	1.2
Cultivated	dom-pedro-16-C3	Alba	1811	-	0.002	0.998	1.2
Cultivated	dona-sol-15-B10	Hybrid Gallica	1842	-	0.003	0.997	1.2
Cultivated	duc-d-angouleme-15-H4	Centifolia	1821	-	0.0135	0.9865	1.2
Cultivated	gonsalve-8-C2	Hybrid Gallica	1835	-	0.0039	0.9961	1.2
Cultivated	duc-de-guiche-9-B3	Hybrid Gallica	1810	-	0.0047	0.9953	1.2
Cultivated	duchesse-d-angouleme-8-F12	Hybrid Gallica	1821	-	0.002	0.998	1.2
Cultivated	duchesse-de-berry-15-C10	Hybrid Gallica	1818	-	0.0045	0.9955	1.2
Cultivated	duchesse-de-buccleugh-9-C1	Hybrid Gallica	1837	-	0.003	0.997	1.2
Cultivated	duchesse-de-montebello-15-D10	Hybrid Gallica	1824	-	0.0069	0.9931	1.2
Cultivated	duchesse-de-portland-14-G11	Portland	1775	-	0.003	0.997	1.2
Cultivated	eulalie-lebrun-16-B8	Hybrid Gallica	1844	-	0.003	0.997	1.2
Cultivated	eveque-16-F6	Hybrid Gallica	1790	-	0.0027	0.9973	1.2
Cultivated	pergolese-16-C12	Portland	1860	-	0.003	0.997	1.2
Cultivated	foliacee-16-G1	Centifolia	1810	-	0.0148	0.9852	1.2
Cultivated	frankfurt-9-C3	Hybrid Gallica	1583	-	0.0058	0.9942	1.2
Cultivated	fulgens-gallique-15-H2	Hybrid Gallica	1828	-	0.004	0.996	1.2
Cultivated	general-kleber-15-C3	Moss	1856	-	0.0031	0.9969	1.2
Cultivated	grand-cramoisi-8-B2	Hybrid Gallica	1813	-	0.0065	0.9935	1.2
Cultivated	grande-cramoisi-10-D1	Hybrid Gallica	1813	-	0.008	0.992	1.2
Cultivated	pourpre-charmant-15-B8	Hybrid Gallica	1811	-	0.0024	0.9976	1.2

Category	ID Individual	Species / Horticultural Group	YEAR	Country	MP cluster 1.1	MP cluster 1.2	Cluster
Cultivated	imperatrice-josephine-15-E10	Hybrid Gallica	1789	-	0.0218	0.9782	1.2
Cultivated	indigo-14-B12	Portland	1830	-	0.003	0.997	1.2
Cultivated	jacques-cartier-10-G2	Portland	1868	-	0.002	0.998	1.2
Cultivated	jenny-duval-15-G10	Hybrid Gallica	1842	-	0.2145	0.7855	1.2*
Cultivated	josephine-ritter-15-A4	Hybrid Multiflora	1900	-	0.002	0.998	1.2
Cultivated	julie-krudner-15-D12	Portland	1847	-	0.0118	0.9882	1.2
Cultivated	la-belle-sultane-15-G3	Hybrid Gallica	1795	-	0.005	0.995	1.2
Cultivated	la-maculee-9-H2	Hybrid Gallica	1810	-	0.0057	0.9943	1.2
Cultivated	l-ardoisee-9-D1	Hybrid Gallica	1811	-	0.004	0.996	1.2
Cultivated	lea-15-H10	Hybrid Gallica	1825	-	0.002	0.998	1.2
Cultivated	leda-8-B12	Damask	1827	-	0.002	0.998	1.2
Cultivated	le-loberde-7-H10	Moss	1800	-	0.003	0.997	1.2
Cultivated	le-rire-niais-9-H1	Centifolia	1810	-	0.0053	0.9947	1.2
Cultivated	lycoris-9-B2	Hybrid Gallica	1835	-	0.0039	0.9961	1.2
Cultivated	maiden-s-blush-16-G6	Alba	1797	-	0.2628	0.7372	1.2*
Cultivated	marie-de-saint-jean-8-H7	Portland	1869	-	0.0055	0.9945	1.2
Cultivated	marie-louise-9-A2	Damask	< 1813	-	0.0041	0.9959	1.2
Cultivated	mignonne-charmante-8-B1	Moss	1814	-	0.002	0.998	1.2
Cultivated	mme-hardy-9-C11	Damask	1832	-	0.002	0.998	1.2
Cultivated	moise-15-F5	Hybrid Gallica	1828	-	0.003	0.997	1.2
Cultivated	napoleon-8-C1	Hybrid Gallica	1790	-	0.0088	0.9912	1.2
Cultivated	nouveau-monde-8-A1	Hybrid Gallica	1811	-	0.0021	0.9979	1.2
Cultivated	nouveau-rouge-10-D3	Hybrid Gallica	1811	-	0.003	0.997	1.2
Cultivated	nouvelle-transparente-9-D9	Hybrid Gallica	1835	-	0.0099	0.9901	1.2
Cultivated	tetra-oeill	Damask	1835	-	0.0032	0.9968	1.2
Cultivated	oeillet-double-16-H5	Hybrid Gallica	1829	-	0.0057	0.9943	1.2
Cultivated	paeonienrose-10-H3	Hybrid Gallica	1845	-	0.004	0.996	1.2
Cultivated	parure-des-vierges-8-E1	Hybrid Gallica	1801	-	0.003	0.997	1.2
Cultivated	petite-lisette-15-G5	Alba	1817	-	0.0022	0.9978	1.2
Cultivated	pompon-panache-15-D2	Hybrid Gallica	1857	-	0.0051	0.9949	1.2
Cultivated	provins-marbre-15-C8	Hybrid Gallica	1819	-	0.003	0.997	1.2
Cultivated	provins-renoncule-15-E11	Hybrid Gallica	1810	-	0.0499	0.9501	1.2
Cultivated	reine-des-centfeuilles-14-F12	Centifolia	1824	-	0.002	0.998	1.2
Cultivated	reine-des-mousseuses-16-C4	Moss	1860	-	0.0041	0.9959	1.2
Cultivated	reverend-h-d-ombrain-8-E2	Bourbon	1863	-	0.002	0.998	1.2
Cultivated	rosa-andersonii-15-C4	Inter Species	1912	-	0.4679	0.5321	1.2*
Cultivated	rosa-centifolia-cristata-15-F6	Centifolia	1824	-	0.002	0.998	1.2
Cultivated	rosa-centifolia-major-9-C9	Centifolia	1597	-	0.002	0.998	1.2
Cultivated	rosa-centifolia-parvifolia-8-B7	Hybrid Gallica	1664	-	0.004	0.996	1.2
Cultivated	rosa-centifolia-variegata-8-H4	Centifolia	1817	-	0.003	0.997	1.2
Cultivated	rosa-dupontii-8-H9	Inter Species	1817	-	0.0038	0.9962	1.2
Cultivated	rosa-gallica-15-B6	Botanic Species	Botanic	-	0.0557	0.9443	1.2
Cultivated	rosa-gallica-8-G7	Botanic Species	Botanic	-	0.4213	0.5787	1.2*
Cultivated	rosa-gallica-forme-d-epire-10-A3	Hybrid Gallica	Unknown	-	0.9839	0.0161	1.1
Cultivated	rosa-gallica-huilii-9-G3	Hybrid Gallica	Botanic	-	0.003	0.997	1.2

Category	ID Individual	Species / Horticultural Group	YEAR	Country	MP cluster 1.1	MP cluster 1.2	Cluster
Cultivated	rosa-gallica-incarnata-8-G11	Hybrid Gallica	Botanic	-	0.995	0.005	1.1
Cultivated	rosa-gallica-poumi-8-D6	Hybrid Gallica	Unknown	-	0.0023	0.9977	1.2
Cultivated	rosa-gallica-pumila-8-E9	Hybrid Gallica	1789	-	0.996	0.004	1.1
Cultivated	rosa-gallica-tricolore-16-C7	Hybrid Gallica	1827	-	0.0031	0.9969	1.2
Cultivated	rosa-gallica-velutinaeflora-8-E5	Botanic Species	1850	-	0.9971	0.0029	1.1
Cultivated	rosa-macrantha-8-C9	Hybrid Gallica	Botanic	-	0.6882	0.3118	1.1*
Cultivated	rosa-mundi-selfcoloured-16-D7	Hybrid Gallica	1759	-	0.003	0.997	1.2
Cultivated	rosa-muscipula-8-F7	Hybrid Gallica	Botanic	-	0.9733	0.0267	1.1
Cultivated	rosa-proliferea-10-C2	Centifolia	1817	-	0.3669	0.6331	1.2*
Cultivated	rosa-sublaevis-9-H8	Inter Species	Botanic	-	0.3806	0.6194	1.2*
Cultivated	rosa-sylvatica-8-C8	Inter Species	1826	-	0.346	0.654	1.2*
Cultivated	rosa-villosa-recondita-7-A9	Botanic Species	1771	-	0.9202	0.0798	1.1
Cultivated	rose-de-provins-16-E7	Botanic Species	1240	-	0.0053	0.9947	1.2
Cultivated	rose-de-rescht-8-C4	Portland	1880	-	0.003	0.997	1.2
Cultivated	rose-edouard-13-E5	Bourbon	1819	-	0.003	0.997	1.2
Cultivated	roxelane-16-C10	Hybrid China	1824	-	0.002	0.998	1.2
Cultivated	sidonie-8-C7	Hybrid Perpetual	1845	-	0.002	0.998	1.2
Cultivated	soleil-brillant-10-B3	Hybrid Gallica	1783	-	0.006	0.994	1.2
Cultivated	spencer-8-E12	Hybrid Perpetual	1892	-	0.0103	0.9897	1.2
Cultivated	surpasse-tout-10-A1	Hybrid Gallica	1811	-	0.0059	0.9941	1.2
Cultivated	tetra-janet	Hybrid Eglanteria	1894	-	0.1979	0.8021	1.2
Cultivated	the-portland-rose-16-H11	Portland	1775	-	0.0033	0.9967	1.2
Cultivated	toussaint-l-ouverture-15-A12	Bourbon	1849	-	0.0049	0.9951	1.2
Cultivated	tricolore-9-E3	Hybrid Multiflora	1827	-	0.003	0.997	1.2
Cultivated	unique-de-provence-15-A7	Centifolia	1775	-	0.0397	0.9603	1.2
Cultivated	unique-panachee-7-B10	Centifolia	1821	-	0.002	0.998	1.2
Cultivated	van-huyssum-16-D10	Damask	1732	-	0.003	0.997	1.2
Cultivated	yolande-d-aragon-7-G9	Portland	1843	-	0.0031	0.9969	1.2
Other sp	1-arv-SLO-7	Rosa arvensis Huds.	-	-	0.9962	0.0038	1.1
Other sp	1-arv-TEMPLE-5	Rosa arvensis L.	-	-	0.9976	0.0024	1.1
Other sp	1-SAINT-CIRQ-18	Rosa ressemblant gallica	-	-	0.998	0.002	1.1
Other sp	1-sem-AURIEBAT-1	Rosa sempervirens L.	-	-	0.997	0.003	1.1
Other sp	1-sem-SLO-10	Rosa sempervirens L.	-	-	0.9965	0.0035	1.1
Other sp	arvensis-5	Rosa arvensis Huds.	-	-	0.995	0.005	1.1
Other sp	cent-2	Rosa centifolia	-	-	0.0477	0.9523	1.2
Other sp	CEX-01	Rosa x centifolia L. var. muscosa	-	-	0.002	0.998	1.2
Other sp	DAM-02	Rosa damascena L.	-	-	0.002	0.998	1.2
Other sp	di-rarv	Rosa arvensis	-	-	0.003	0.997	1.2
Other sp	pervirens-6	Rosa arvensis x sempervirens	-	-	0.9973	0.0027	1.1
Other sp	pharma-provins-7	Rosier de Provins	-	-	0.002	0.998	1.2
Other sp	PHO-02	Rosa phoenicea Boiss.	-	-	0.7306	0.2694	1.1*
Other sp	rescht-1	Rosa de Rescht	-	-	0.1245	0.8755	1.2
Other sp	S-1-TOMBEBOEUF-5	Rosa gallica x syns.	-	-	0.1713	0.8287	1.2
Other sp	S-5-HON-5	Rosa gallica var. czackiana	-	-	0.9713	0.0287	1.1
Other sp	Sgal-Rosa-gallica-officinalis-1	Rosa gallica var officinalis	-	-	0.3221	0.6779	1.2*

Category	ID Individual	Species / Horticultural Group	YEAR	Country	MP cluster 1.1	MP cluster 1.2	Cluster
R. gallica	Sgal-3-UKR-2	Rosa gallica L.	-	Ukraine	0.992	0.008	1.1
R. gallica	Sgal-1-CHAMADELLE-1	Rosa gallica L.	-	France	0.0021	0.9979	1.2
R. gallica	Sgal-10-ALL-3	Rosa gallica L.	-	Germany	0.9945	0.0055	1.1
R. gallica	Sgal-10-AUT-2	Rosa gallica L.	-	Austria	0.9948	0.0052	1.1
R. gallica	Sgal-10-CRO-1	Rosa gallica L.	-	Croatia	0.9918	0.0082	1.1
R. gallica	Sgal-10-CRO-2	Rosa gallica L.	-	Croatia	0.9868	0.0132	1.1
R. gallica	Sgal-10-ITA-18026	Rosa gallica L.	-	Italy	0.9814	0.0186	1.1
R. gallica	Sgal-10-POL-3	Rosa gallica L.	-	Poland	0.9959	0.0041	1.1
R. gallica	Sgal-11-ALL-1	Rosa gallica L.	-	Germany	0.995	0.005	1.1
R. gallica	Sgal-11-ALL-2	Rosa gallica L.	-	Germany	0.9891	0.0109	1.1
R. gallica	Sgal-11-ALL-3	Rosa gallica L.	-	Germany	0.998	0.002	1.1
R. gallica	Sgal-11-ALL-4	Rosa gallica L.	-	Germany	0.9951	0.0049	1.1
R. gallica	Sgal-11-AUT-1	Rosa gallica L.	-	Austria	0.997	0.003	1.1
R. gallica	Sgal-11-AUT-2	Rosa gallica L.	-	Austria	0.9947	0.0053	1.1
R. gallica	Sgal-11-CRO-1	Rosa gallica L.	-	Croatia	0.9911	0.0089	1.1
R. gallica	Sgal-11-ITA-12654	Rosa gallica L.	-	Italy	0.996	0.004	1.1
R. gallica	Sgal-11-POL-1	Rosa gallica L.	-	Poland	0.9909	0.0091	1.1
R. gallica	Sgal-11-POL-2	Rosa gallica L.	-	Poland	0.9718	0.0282	1.1
R. gallica	Sgal-11-POL-4	Rosa gallica L.	-	Poland	0.9585	0.0415	1.1
R. gallica	Sgal-12-AUT-2	Rosa gallica L.	-	Austria	0.9703	0.0297	1.1
R. gallica	Sgal-12-CRO-1	Rosa gallica L.	-	Croatia	0.9912	0.0088	1.1
R. gallica	Sgal-12-HON-1	Rosa gallica L.	-	Hungary	0.996	0.004	1.1
R. gallica	Sgal-12-ITA-1	Rosa gallica L.	-	Italy	0.997	0.003	1.1
R. gallica	Sgal-12-POL-1	Rosa gallica L.	-	Poland	0.9851	0.0149	1.1
R. gallica	Sgal-13-AUT-1	Rosa gallica L.	-	Austria	0.996	0.004	1.1
R. gallica	Sgal-13-AUT-2	Rosa gallica L.	-	Austria	0.9958	0.0042	1.1
R. gallica	Sgal-13-CRO-1	Rosa gallica L.	-	Croatia	0.9858	0.0142	1.1
R. gallica	Sgal-13-CRO-4	Rosa gallica L.	-	Croatia	0.9889	0.0111	1.1
R. gallica	Sgal-13-ITA-2	Rosa gallica L.	-	Italy	0.9868	0.0132	1.1
R. gallica	Sgal-13-ITA-6	Rosa gallica L.	-	Italy	0.9949	0.0051	1.1
R. gallica	Sgal-13-POL-3	Rosa gallica L.	-	Poland	0.995	0.005	1.1
R. gallica	Sgal-13-POL-2	Rosa gallica L.	-	Poland	0.9951	0.0049	1.1
R. gallica	Sgal-14-AUT-1	Rosa gallica L.	-	Austria	0.9887	0.0113	1.1
R. gallica	Sgal-14-CRO-1	Rosa gallica L.	-	Croatia	0.9923	0.0077	1.1
R. gallica	Sgal-15-AUT-1	Rosa gallica L.	-	Austria	0.997	0.003	1.1
R. gallica	Sgal-15-AUT-2	Rosa gallica L.	-	Austria	0.9955	0.0045	1.1
R. gallica	Sgal-15-CRO-4	Rosa gallica L.	-	Croatia	0.9407	0.0593	1.1
R. gallica	Sgal-15-POL-1	Rosa gallica L.	-	Poland	0.992	0.008	1.1
R. gallica	Sgal-15-POL-2	Rosa gallica L.	-	Poland	0.9967	0.0033	1.1
R. gallica	Sgal-15-POL-3	Rosa gallica L.	-	Poland	0.9935	0.0065	1.1
R. gallica	Sgal-16-AUT-1	Rosa gallica L.	-	Austria	0.9944	0.0056	1.1
R. gallica	Sgal-16-AUT-2	Rosa gallica L.	-	Austria	0.9889	0.0111	1.1
R. gallica	Sgal-16-POL-1	Rosa gallica L.	-	Poland	0.995	0.005	1.1
R. gallica	Sgal-16-POL-2	Rosa gallica L.	-	Poland	0.9951	0.0049	1.1
R. gallica	Sgal-16-POL-3	Rosa gallica L.	-	Poland	0.996	0.004	1.1

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R. gallica	Sgal-16-POL-4	Rosa gallica L.	-	Poland	0.996	0.004	1.1
R. gallica	Sgal-17-AUT-1	Rosa gallica L.	-	Austria	0.996	0.004	1.1
R. gallica	Sgal-18-AUT-1	Rosa gallica L.	-	Austria	0.996	0.004	1.1
R. gallica	Sgal-18-AUT-2	Rosa gallica L.	-	Austria	0.997	0.003	1.1
R. gallica	Sgal-19-AUT-1	Rosa gallica L.	-	Austria	0.9871	0.0129	1.1
R. gallica	Sgal-1-ALL-3	Rosa gallica L.	-	Germany	0.9918	0.0082	1.1
R. gallica	Sgal-1-ALL-4	Rosa gallica L.	-	Germany	0.993	0.007	1.1
R. gallica	Sgal-1-AUT-2	Rosa gallica L.	-	Austria	0.995	0.005	1.1
R. gallica	Sgal-1-BILLY-1	Rosa gallica L.	-	France	0.4831	0.5169	1.2*
R. gallica	Sgal-1-CERDON-5	Rosa gallica L.	-	France	0.0249	0.9751	1.2
R. gallica	Sgal-1-CORQUOY-1	Rosa gallica L.	-	France	0.6251	0.3749	1.1*
R. gallica	Sgal-1-CORQUOY-3	Rosa gallica L.	-	France	0.6003	0.3997	1.1*
R. gallica	Sgal-1-CORQUOY-5	Rosa gallica L.	-	France	0.8957	0.1043	1.1
R. gallica	Sgal-1-CORQUOY-7	Rosa gallica L.	-	France	0.6686	0.3314	1.1*
R. gallica	Sgal-1-CRO-1	Rosa gallica L.	-	Croatia	0.9941	0.0059	1.1
R. gallica	Sgal-1-CRO-2	Rosa gallica L.	-	Croatia	0.9919	0.0081	1.1
R. gallica	Sgal-1-CRO-3	Rosa gallica L.	-	Croatia	0.998	0.002	1.1
R. gallica	Sgal-1-CRO-4	Rosa gallica L.	-	Croatia	0.9899	0.0101	1.1
R. gallica	Sgal-1-CZE-11	Rosa gallica L.	-	Czech Republic	0.997	0.003	1.1
R. gallica	Sgal-1-DOURS-1	Rosa gallica L.	-	France	0.5512	0.4488	1.1*
R. gallica	Sgal-3-UKR-4	Rosa gallica L.	-	Ukraine	0.9739	0.0261	1.1
R. gallica	Sgal-1-ITA-1	Rosa gallica L.	-	Italy	0.9812	0.0188	1.1
R. gallica	Sgal-1-ITA-3	Rosa gallica L.	-	Italy	0.997	0.003	1.1
R. gallica	Sgal-1-ITA-4	Rosa gallica L.	-	Italy	0.9915	0.0085	1.1
R. gallica	Sgal-1-ITA-6	Rosa gallica L.	-	Italy	0.9937	0.0063	1.1
R. gallica	Sgal-1-ITA-7	Rosa gallica L.	-	Italy	0.9937	0.0063	1.1
R. gallica	Sgal-1-MOL-2	Rosa gallica L.	-	Moldova	0.994	0.006	1.1
R. gallica	Sgal-1-MONTAUBAN-1	Rosa gallica L.	-	France	0.0353	0.9647	1.2
R. gallica	Sgal-1-MONTDOURMEC-1	Rosa gallica L.	-	France	0.4925	0.5075	1.2*
R. gallica	Sgal-1-MONTDOURMEC-7	Rosa gallica L.	-	France	0.5945	0.4055	1.1*
R. gallica	Sgal-1-MONTDOURMEC-9	Rosa gallica L.	-	France	0.7951	0.2049	1.1*
R. gallica	Sgal-1-PESSAC-1	Rosa gallica L.	-	France	0.1073	0.8927	1.2
R. gallica	Sgal-1-PESSAC-4	Rosa gallica L.	-	France	0.016	0.984	1.2
R. gallica	Sgal-1-POL-1	Rosa gallica L.	-	Poland	0.997	0.003	1.1
R. gallica	Sgal-1-PRIMELLES-15	Rosa gallica L.	-	France	0.6017	0.3983	1.1*
R. gallica	Sgal-1-PRIMELLES-16	Rosa gallica L.	-	France	0.477	0.523	1.2*
R. gallica	Sgal-1-PRIMELLES-1	Rosa gallica L.	-	France	0.4565	0.5435	1.2*
R. gallica	Sgal-1-PRIMELLES-2	Rosa gallica L.	-	France	0.5179	0.4821	1.1*
R. gallica	Sgal-1-PRIMELLES-4	Rosa gallica L.	-	France	0.3027	0.6973	1.2*
R. gallica	Sgal-1-PRIMELLES-7	Rosa gallica L.	-	France	0.659	0.341	1.1*
R. gallica	Sgal-1-PRIMELLES-8	Rosa gallica L.	-	France	0.4545	0.5455	1.2*
R. gallica	Sgal-1-PRIMELLES-9	Rosa gallica L.	-	France	0.5795	0.4205	1.1*
R. gallica	Sgal-1-REBRECHIEN-1	Rosa gallica L.	-	France	0.0079	0.9921	1.2
R. gallica	Sgal-1-REBRECHIEN-3	Rosa gallica L.	-	France	0.3513	0.6487	1.2*
R. gallica	Sgal-1-REBRECHIEN-4	Rosa gallica L.	-	France	0.3832	0.6168	1.2*

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R. gallica	Sgal-1-ROU-1	Rosa gallica L.	-	Romania	0.981	0.019	1.1
R. gallica	Sgal-1-SAINT-CIRQ-10	Rosa gallica L.	-	France	0.9699	0.0301	1.1
R. gallica	Sgal-1-SAINT-CIRQ-11	Rosa gallica L.	-	France	0.6269	0.3731	1.1*
R. gallica	Sgal-1-SAINT-CIRQ-12	Rosa gallica L.	-	France	0.9675	0.0325	1.1
R. gallica	Sgal-1-SAINT-CIRQ-14	Rosa gallica L.	-	France	0.9939	0.0061	1.1
R. gallica	Sgal-1-SAINT-CIRQ-15	Rosa gallica L.	-	France	0.6663	0.3337	1.1*
R. gallica	Sgal-1-SAINT-CIRQ-1	Rosa gallica L.	-	France	0.9911	0.0089	1.1
R. gallica	Sgal-1-SAINT-CIRQ-3	Rosa gallica L.	-	France	0.997	0.003	1.1
R. gallica	Sgal-1-SAINT-CIRQ-5	Rosa gallica L.	-	France	0.9597	0.0403	1.1
R. gallica	Sgal-1-SAINT-CIRQ-6	Rosa gallica L.	-	France	0.7259	0.2741	1.1*
R. gallica	Sgal-1-SAINT-CIRQ-7	Rosa gallica L.	-	France	0.9907	0.0093	1.1
R. gallica	Sgal-1-SAINT-CIRQ-8	Rosa gallica L.	-	France	0.9932	0.0068	1.1
R. gallica	Sgal-1-SAINT-LYE-LA-FORET-1	Rosa gallica L.	-	France	0.0111	0.9889	1.2
R. gallica	Sgal-1-SAINT-NAUPHARY-11	Rosa gallica L.	-	France	0.3838	0.6162	1.2*
R. gallica	Sgal-1-SAINT-NAUPHARY-12	Rosa gallica L.	-	France	0.5249	0.4751	1.1*
R. gallica	Sgal-1-SAINT-NAUPHARY-13	Rosa gallica L.	-	France	0.2759	0.7241	1.2*
R. gallica	Sgal-1-SAINT-NAUPHARY-15	Rosa gallica L.	-	France	0.1891	0.8109	1.2
R. gallica	Sgal-1-SAINT-NAUPHARY-17	Rosa gallica L.	-	France	0.396	0.604	1.2*
R. gallica	Sgal-1-SAINT-NAUPHARY-1	Rosa gallica L.	-	France	0.2696	0.7304	1.2*
R. gallica	Sgal-1-SAINT-NAUPHARY-20	Rosa gallica L.	-	France	0.5361	0.4639	1.1*
R. gallica	Sgal-1-SAINT-NAUPHARY-3	Rosa gallica L.	-	France	0.3341	0.6659	1.2*
R. gallica	Sgal-1-SAINT-NAUPHARY-6	Rosa gallica L.	-	France	0.7188	0.2812	1.1*
R. gallica	Sgal-1-SAINT-NAUPHARY-9	Rosa gallica L.	-	France	0.0427	0.9573	1.2
R. gallica	Sgal-1-SAVIGNAC-6	Rosa gallica L.	-	France	0.002	0.998	1.2
R. gallica	Sgal-1-SLK-1	Rosa gallica L.	-	Slovakia	0.9969	0.0031	1.1
R. gallica	Sgal-1-UKR-1	Rosa gallica L.	-	Ukraine	0.9969	0.0031	1.1
R. gallica	Sgal-1-UKR-8	Rosa gallica L.	-	Ukraine	0.995	0.005	1.1
R. gallica	Sgal-1-VIRAZEIL-1	Rosa gallica L.	-	France	0.4496	0.5504	1.2*
R. gallica	Sgal-2-ALL-1	Rosa gallica L.	-	Germany	0.9911	0.0089	1.1
R. gallica	Sgal-2-ALL-3	Rosa gallica L.	-	Germany	0.9902	0.0098	1.1
R. gallica	Sgal-2-AUT-1	Rosa gallica L.	-	Austria	0.9964	0.0036	1.1
R. gallica	Sgal-2-AUT-2	Rosa gallica L.	-	Austria	0.9929	0.0071	1.1
R. gallica	Sgal-2-AUT-3	Rosa gallica L.	-	Austria	0.995	0.005	1.1
R. gallica	Sgal-2-CRO-2	Rosa gallica L.	-	Croatia	0.992	0.008	1.1
R. gallica	Sgal-2-CRO-4	Rosa gallica L.	-	Croatia	0.9025	0.0975	1.1
R. gallica	Sgal-2-CZE-1	Rosa gallica L.	-	Czech Republic	0.9963	0.0037	1.1
R. gallica	Sgal-2-HON-1	Rosa gallica L.	-	Hungary	0.9915	0.0085	1.1
R. gallica	Sgal-2-HON-2	Rosa gallica L.	-	Hungary	0.9931	0.0069	1.1
R. gallica	Sgal-2-ITA-1	Rosa gallica L.	-	Italy	0.9619	0.0381	1.1
R. gallica	Sgal-2-MOL-2	Rosa gallica L.	-	Moldova	0.9877	0.0123	1.1
R. gallica	Sgal-2-POL-1	Rosa gallica L.	-	Poland	0.9908	0.0092	1.1
R. gallica	Sgal-2-PRIMELLES-11	Rosa gallica L.	-	France	0.5904	0.4096	1.1*
R. gallica	Sgal-2-PRIMELLES-13	Rosa gallica L.	-	France	0.9159	0.0841	1.1
R. gallica	Sgal-2-PRIMELLES-1	Rosa gallica L.	-	France	0.9717	0.0283	1.1
R. gallica	Sgal-2-PRIMELLES-3	Rosa gallica L.	-	France	0.7231	0.2769	1.1*

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R. gallica	Sgal-2-PRIMELLES-5	Rosa gallica L.	-	France	0.3903	0.6097	1.2*
R. gallica	Sgal-2-PRIMELLES-7	Rosa gallica L.	-	France	0.5697	0.4303	1.1*
R. gallica	Sgal-2-PRIMELLES-8	Rosa gallica L.	-	France	0.6804	0.3196	1.1*
R. gallica	Sgal-2-ROU-1	Rosa gallica L.	-	Romania	0.9927	0.0073	1.1
R. gallica	Sgal-2-ROU-2	Rosa gallica L.	-	Romania	0.9886	0.0114	1.1
R. gallica	Sgal-2-ROU-4	Rosa gallica L.	-	Romania	0.9949	0.0051	1.1
R. gallica	Sgal-2-SAINT-LYE-LA-FORET-1	Rosa gallica L.	-	France	0.0039	0.9961	1.2
R. gallica	Sgal-2-SAINT-LYE-LA-FORET-8	Rosa gallica L.	-	France	0.005	0.995	1.2
R. gallica	Sgal-2-SLO-11	Rosa gallica L.	-	Slovenia	0.9945	0.0055	1.1
R. gallica	Sgal-2-SLO-12	Rosa gallica L.	-	Slovenia	0.9917	0.0083	1.1
R. gallica	Sgal-2-SLO-13	Rosa gallica L.	-	Slovenia	0.944	0.056	1.1
R. gallica	Sgal-2-SLO-14	Rosa gallica L.	-	Slovenia	0.9941	0.0059	1.1
R. gallica	Sgal-2-SLO-15	Rosa gallica L.	-	Slovenia	0.9966	0.0034	1.1
R. gallica	Sgal-2-SLO-3	Rosa gallica L.	-	Slovenia	0.9767	0.0233	1.1
R. gallica	Sgal-2-SLO-5	Rosa gallica L.	-	Slovenia	0.9895	0.0105	1.1
R. gallica	Sgal-2-SLO-7	Rosa gallica L.	-	Slovenia	0.9937	0.0063	1.1
R. gallica	Sgal-2-SLO-9	Rosa gallica L.	-	Slovenia	0.9907	0.0093	1.1
R. gallica	Sgal-2-UKR-18	Rosa gallica L.	-	Ukraine	0.9819	0.0181	1.1
R. gallica	Sgal-2-UKR-1	Rosa gallica L.	-	Ukraine	0.9968	0.0032	1.1
R. gallica	Sgal-2-UKR-21	Rosa gallica L.	-	Ukraine	0.997	0.003	1.1
R. gallica	Sgal-2-UKR-6	Rosa gallica L.	-	Ukraine	0.9048	0.0952	1.1
R. gallica	Sgal-3-ALL-1	Rosa gallica L.	-	Germany	0.996	0.004	1.1
R. gallica	Sgal-3-ALL-3	Rosa gallica L.	-	Germany	0.9925	0.0075	1.1
R. gallica	Sgal-3-AUT-1	Rosa gallica L.	-	Austria	0.996	0.004	1.1
R. gallica	Sgal-3-CRO-4	Rosa gallica L.	-	Croatia	0.9937	0.0063	1.1
R. gallica	Sgal-3-CZE-1	Rosa gallica L.	-	Czech Republic	0.9275	0.0725	1.1
R. gallica	Sgal-3-ESP-1	Rosa gallica L.	-	Spain	0.2717	0.7283	1.2*
R. gallica	Sgal-3-HON-1	Rosa gallica L.	-	Hungary	0.9817	0.0183	1.1
R. gallica	Sgal-3-HON-2	Rosa gallica L.	-	Hungary	0.9939	0.0061	1.1
R. gallica	Sgal-3-ITA-1	Rosa gallica L.	-	Italy	0.996	0.004	1.1
R. gallica	Sgal-3-POL-1	Rosa gallica L.	-	Poland	0.9885	0.0115	1.1
R. gallica	Sgal-3-POL-3	Rosa gallica L.	-	Poland	0.9949	0.0051	1.1
R. gallica	Sgal-3-POL-4	Rosa gallica L.	-	Poland	0.9963	0.0037	1.1
R. gallica	Sgal-3-POL-6	Rosa gallica L.	-	Poland	0.997	0.003	1.1
R. gallica	Sgal-3-ROU-1	Rosa gallica L.	-	Romania	0.997	0.003	1.1
R. gallica	Sgal-3-ROU-3	Rosa gallica L.	-	Romania	0.997	0.003	1.1
R. gallica	Sgal-3-SLO-2	Rosa gallica L.	-	Slovenia	0.8974	0.1026	1.1
R. gallica	Sgal-3-UKR-3	Rosa gallica L.	-	Ukraine	0.9781	0.0219	1.1
R. gallica	Sgal-4-ALL-1	Rosa gallica L.	-	Germany	0.997	0.003	1.1
R. gallica	Sgal-4-ALL-2	Rosa gallica L.	-	Germany	0.9931	0.0069	1.1
R. gallica	Sgal-4-ALL-3	Rosa gallica L.	-	Germany	0.997	0.003	1.1
R. gallica	Sgal-4-ALL-4	Rosa gallica L.	-	Germany	0.9949	0.0051	1.1
R. gallica	Sgal-4-AUT-2	Rosa gallica L.	-	Austria	0.9971	0.0029	1.1
R. gallica	Sgal-4-CZE-1	Rosa gallica L.	-	Czech Republic	0.7148	0.2852	1.1*
R. gallica	Sgal-4-CZE-2	Rosa gallica L.	-	Czech Republic	0.9929	0.0071	1.1

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R. gallica	Sgal-4-CZE-4	Rosa gallica L.	-	Czech Republic	0.9689	0.0311	1.1
R. gallica	Sgal-4-HON-1	Rosa gallica L.	-	Hungary	0.9949	0.0051	1.1
R. gallica	Sgal-4-ITA-1	Rosa gallica L.	-	Italy	0.9917	0.0083	1.1
R. gallica	Sgal-4-POL-1	Rosa gallica L.	-	Poland	0.997	0.003	1.1
R. gallica	Sgal-4-POL-2	Rosa gallica L.	-	Poland	0.996	0.004	1.1
R. gallica	Sgal-4-POL-3	Rosa gallica L.	-	Poland	0.9934	0.0066	1.1
R. gallica	Sgal-4-POL-4	Rosa gallica L.	-	Poland	0.9945	0.0055	1.1
R. gallica	Sgal-4-ROU-1	Rosa gallica L.	-	Romania	0.9941	0.0059	1.1
R. gallica	Sgal-4-SLO-1	Rosa gallica L.	-	Slovenia	0.7441	0.2559	1.1*
R. gallica	Sgal-4-SLO-2	Rosa gallica L.	-	Slovenia	0.9847	0.0153	1.1
R. gallica	Sgal-4-SLO-4	Rosa gallica L.	-	Slovenia	0.996	0.004	1.1
R. gallica	Sgal-4-SLO-6	Rosa gallica L.	-	Slovenia	0.9919	0.0081	1.1
R. gallica	Sgal-4-SLO-7	Rosa gallica L.	-	Slovenia	0.8153	0.1847	1.1
R. gallica	Sgal-4-SLO-8	Rosa gallica L.	-	Slovenia	0.995	0.005	1.1
R. gallica	Sgal-5-ALL-3	Rosa gallica L.	-	Germany	0.997	0.003	1.1
R. gallica	Sgal-5-AUT-1	Rosa gallica L.	-	Austria	0.994	0.006	1.1
R. gallica	Sgal-5-AUT-4	Rosa gallica L.	-	Austria	0.996	0.004	1.1
R. gallica	Sgal-5-CRO-1	Rosa gallica L.	-	Croatia	0.997	0.003	1.1
R. gallica	Sgal-5-CRO-3	Rosa gallica L.	-	Croatia	0.9946	0.0054	1.1
R. gallica	Sgal-5-CRO-4	Rosa gallica L.	-	Croatia	0.9421	0.0579	1.1
R. gallica	Sgal-5-CZE-1	Rosa gallica L.	-	Czech Republic	0.9631	0.0369	1.1
R. gallica	Sgal-5-CZE-4	Rosa gallica L.	-	Czech Republic	0.9931	0.0069	1.1
R. gallica	Sgal-5-HON-1	Rosa gallica L.	-	Hungary	0.997	0.003	1.1
R. gallica	Sgal-5-HON-2	Rosa gallica L.	-	Hungary	0.998	0.002	1.1
R. gallica	Sgal-5-ITA-1	Rosa gallica L.	-	Italy	0.9345	0.0655	1.1
R. gallica	Sgal-5-POL-4	Rosa gallica L.	-	Poland	0.9945	0.0055	1.1
R. gallica	Sgal-5-ROU-1	Rosa gallica L.	-	Romania	0.9969	0.0031	1.1
R. gallica	Sgal-5-ROU-3	Rosa gallica L.	-	Romania	0.9962	0.0038	1.1
R. gallica	Sgal-5-ROU-4	Rosa gallica L.	-	Romania	0.996	0.004	1.1
R. gallica	Sgal-5-SLO-1	Rosa gallica L.	-	Slovenia	0.9717	0.0283	1.1
R. gallica	Sgal-6-ALL-10	Rosa gallica L.	-	Germany	0.2238	0.7762	1.2*
R. gallica	Sgal-6-AUT-1	Rosa gallica L.	-	Austria	0.995	0.005	1.1
R. gallica	Sgal-6-CRO-2	Rosa gallica L.	-	Croatia	0.997	0.003	1.1
R. gallica	Sgal-6-CZE-4	Rosa gallica L.	-	Czech Republic	0.996	0.004	1.1
R. gallica	Sgal-6-HON-1	Rosa gallica L.	-	Hungary	0.9922	0.0078	1.1
R. gallica	Sgal-6-HON-2	Rosa gallica L.	-	Hungary	0.996	0.004	1.1
R. gallica	Sgal-6-ITA-1	Rosa gallica L.	-	Italy	0.9948	0.0052	1.1
R. gallica	Sgal-6-POL-1	Rosa gallica L.	-	Poland	0.996	0.004	1.1
R. gallica	Sgal-6-POL-3	Rosa gallica L.	-	Poland	0.9576	0.0424	1.1
R. gallica	Sgal-6-ROU-1	Rosa gallica L.	-	Romania	0.9958	0.0042	1.1
R. gallica	Sgal-6-ROU-3	Rosa gallica L.	-	Romania	0.992	0.008	1.1
R. gallica	Sgal-6-UKR-1	Rosa gallica L.	-	Ukraine	0.996	0.004	1.1
R. gallica	Sgal-6-UKR-2	Rosa gallica L.	-	Ukraine	0.9956	0.0044	1.1
R. gallica	Sgal-6-UKR-3	Rosa gallica L.	-	Ukraine	0.9961	0.0039	1.1
R. gallica	Sgal-6-UKR-4	Rosa gallica L.	-	Ukraine	0.9941	0.0059	1.1

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R. gallica	Sgal-6-UKR-5	Rosa gallica L.	-	Ukraine	0.9901	0.0099	1.1
R. gallica	Sgal-6-UKR-6	Rosa gallica L.	-	Ukraine	0.9939	0.0061	1.1
R. gallica	Sgal-6-UKR-7	Rosa gallica L.	-	Ukraine	0.9853	0.0147	1.1
R. gallica	Sgal-6-UKR-8	Rosa gallica L.	-	Ukraine	0.9945	0.0055	1.1
R. gallica	Sgal-6-UKR-9	Rosa gallica L.	-	Ukraine	0.9918	0.0082	1.1
R. gallica	Sgal-7-ALL-2	Rosa gallica L.	-	Germany	0.9896	0.0104	1.1
R. gallica	Sgal-7-ALL-3	Rosa gallica L.	-	Germany	0.9909	0.0091	1.1
R. gallica	Sgal-7-AUT-1	Rosa gallica L.	-	Austria	0.9936	0.0064	1.1
R. gallica	Sgal-7-CZE-1	Rosa gallica L.	-	Czech Republic	0.9897	0.0103	1.1
R. gallica	Sgal-7-CZE-2	Rosa gallica L.	-	Czech Republic	0.996	0.004	1.1
R. gallica	Sgal-7-CZE-3	Rosa gallica L.	-	Czech Republic	0.9899	0.0101	1.1
R. gallica	Sgal-7-HON-1	Rosa gallica L.	-	Hungary	0.9957	0.0043	1.1
R. gallica	Sgal-7-ITA-1	Rosa gallica L.	-	Italy	0.9943	0.0057	1.1
R. gallica	Sgal-7-POL-1	Rosa gallica L.	-	Poland	0.995	0.005	1.1
R. gallica	Sgal-7-POL-2	Rosa gallica L.	-	Poland	0.9202	0.0798	1.1
R. gallica	Sgal-7-ROU-1	Rosa gallica L.	-	Romania	0.9881	0.0119	1.1
R. gallica	Sgal-7-ROU-2	Rosa gallica L.	-	Romania	0.995	0.005	1.1
R. gallica	Sgal-7-ROU-3	Rosa gallica L.	-	Romania	0.9882	0.0118	1.1
R. gallica	Sgal-7-ROU-4	Rosa gallica L.	-	Romania	0.9704	0.0296	1.1
R. gallica	Sgal-7-UKR-1	Rosa gallica L.	-	Ukraine	0.988	0.012	1.1
R. gallica	Sgal-8-ALL-2	Rosa gallica L.	-	Germany	0.995	0.005	1.1
R. gallica	Sgal-8-AUT-1	Rosa gallica L.	-	Austria	0.9912	0.0088	1.1
R. gallica	Sgal-8-CRO-1	Rosa gallica L.	-	Croatia	0.9861	0.0139	1.1
R. gallica	Sgal-8-ITA-4295	Rosa gallica L.	-	Italy	0.995	0.005	1.1
R. gallica	Sgal-8-POL-1	Rosa gallica L.	-	Poland	0.996	0.004	1.1
R. gallica	Sgal-8-POL-7	Rosa gallica L.	-	Poland	0.9963	0.0037	1.1
R. gallica	Sgal-8-ROU-2	Rosa gallica L.	-	Romania	0.9948	0.0052	1.1
R. gallica	Sgal-8-ROU-3	Rosa gallica L.	-	Romania	0.9937	0.0063	1.1
R. gallica	Sgal-9-ALL-2	Rosa gallica L.	-	Germany	0.997	0.003	1.1
R. gallica	Sgal-9-AUT-1	Rosa gallica L.	-	Austria	0.9876	0.0124	1.1
R. gallica	Sgal-9-CRO-1	Rosa gallica L.	-	Croatia	0.9939	0.0061	1.1
R. gallica	Sgal-9-HON-1	Rosa gallica L.	-	Hungary	0.6824	0.3176	1.1*
R. gallica	Sgal-9-POL-3	Rosa gallica L.	-	Poland	0.995	0.005	1.1
R. gallica	Sgal-Altorf-A4	Rosa gallica L.	-	France	0.955	0.045	1.1
R. gallica	Sgal-Aspremont-01-2	Rosa gallica L.	-	France	0.9957	0.0043	1.1
R. gallica	Sgal-Aspremont-01-8	Rosa gallica L.	-	France	0.9789	0.0211	1.1
R. gallica	Sgal-Brax-03-2	Rosa gallica L.	-	France	0.003	0.997	1.2
R. gallica	Sgal-Brax-03-6	Rosa gallica L.	-	France	0.0059	0.9941	1.2
R. gallica	Sgal-Chaponost-01-5	Rosa gallica L.	-	France	0.2397	0.7603	1.2*
R. gallica	Sgal-Chateau-Arnoux-01-1	Rosa gallica L.	-	France	0.997	0.003	1.1
R. gallica	Sgal-Cher-A1	Rosa gallica L.	-	France	0.4837	0.5163	1.2*
R. gallica	Sgal-Cher-E1	Rosa gallica L.	-	France	0.9971	0.0029	1.1
R. gallica	Sgal-Cornebarrieu-01-1	Rosa gallica L.	-	France	0.0038	0.9962	1.2
R. gallica	Sgal-Cornebarrieu-01-5	Rosa gallica L.	-	France	0.003	0.997	1.2
R. gallica	Sgal-Daux-Bichou-763	Rosa gallica L.	-	France	0.004	0.996	1.2

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R. gallica	Sgal-Eyguians-01-1	Rosa gallica L.	-	France	0.9921	0.0079	1.1
R. gallica	Sgal-Eyguians-01-3	Rosa gallica L.	-	France	0.9909	0.0091	1.1
R. gallica	Sgal-Eyguians-02-6	Rosa gallica L.	-	France	0.9692	0.0308	1.1
R. gallica	Sgal-Ferney-Voltaire-01-2	Rosa gallica L.	-	France	0.9806	0.0194	1.1
R. gallica	Sgal-Ferney-Voltaire-02-1	Rosa gallica L.	-	France	0.9907	0.0093	1.1
R. gallica	Sgal-Fonsorbes-01-3	Rosa gallica L.	-	France	0.0512	0.9488	1.2
R. gallica	Sgal-Fonsorbes-Piquet-Souleri-368	Rosa gallica L.	-	France	0.004	0.996	1.2
R. gallica	Sgal-Fonsorbes-Route-de-Seysses-283	Rosa gallica L.	-	France	0.0094	0.9906	1.2
R. gallica	Sgal-Fonsorbes-Saint-Flour-RD65a-381	Rosa gallica L.	-	France	0.004	0.996	1.2
R. gallica	Sgal-Fonsorbes-Saint-Flour-RD65a-386	Rosa gallica L.	-	France	0.005	0.995	1.2
R. gallica	Sgal-Fontenilles-01-3	Rosa gallica L.	-	France	0.2139	0.7861	1.2*
R. gallica	Sgal-Fontenilles-Genibrat-88	Rosa gallica L.	-	France	0.004	0.996	1.2
R. gallica	Sgal-Fontenilles-Genibrat-144	Rosa gallica L.	-	France	0.003	0.997	1.2
R. gallica	Sgal-Fontenilles-Genibrat-192	Rosa gallica L.	-	France	0.0063	0.9937	1.2
R. gallica	Sgal-Fontenilles-Genibrat-194	Rosa gallica L.	-	France	0.0049	0.9951	1.2
R. gallica	Sgal-Fontenilles-Genibrat-196	Rosa gallica L.	-	France	0.005	0.995	1.2
R. gallica	Sgal-Fontienne-01-2	Rosa gallica L.	-	France	0.9899	0.0101	1.1
R. gallica	Sgal-Fontienne-01-4	Rosa gallica L.	-	France	0.974	0.026	1.1
R. gallica	Sgal-Fontienne-01-6	Rosa gallica L.	-	France	0.9959	0.0041	1.1
R. gallica	Sgal-Fontienne-01-8	Rosa gallica L.	-	France	0.992	0.008	1.1
R. gallica	Sgal-GAL-01	Rosa gallica L.	-	Germany	0.997	0.003	1.1
R. gallica	Sgal-Grezieu-la-Varenne-01-3	Rosa gallica L.	-	France	0.5446	0.4554	1.1*
R. gallica	Sgal-Ingwiller-H1	Rosa gallica L.	-	France	0.9709	0.0291	1.1
R. gallica	Sgal-Leguevin-07-2	Rosa gallica L.	-	France	0.006	0.994	1.2
R. gallica	Sgal-Leguevin-15-1	Rosa gallica L.	-	France	0.0029	0.9971	1.2
R. gallica	Sgal-Leguevin-20-2	Rosa gallica L.	-	France	0.0053	0.9947	1.2
R. gallica	Sgal-Leguevin-20-7	Rosa gallica L.	-	France	0.0078	0.9922	1.2
R. gallica	Sgal-Leguevin-20-8	Rosa gallica L.	-	France	0.004	0.996	1.2
R. gallica	Sgal-Leguevin-29-2	Rosa gallica L.	-	France	0.0039	0.9961	1.2
R. gallica	Sgal-Leguevin-College-Dechetterie-712	Rosa gallica L.	-	France	0.0031	0.9969	1.2
R. gallica	Sgal-Leguevin-College-Dechetterie-391	Rosa gallica L.	-	France	0.0051	0.9949	1.2
R. gallica	Sgal-Leguevin-entre-college-et-dechetterie-425	Rosa gallica L.	-	France	0.0119	0.9881	1.2
R. gallica	Sgal-Leguevin-entre-college-et-dechetterie-598	Rosa gallica L.	-	France	0.004	0.996	1.2
R. gallica	Sgal-Leguevin-Mader-55	Rosa gallica L.	-	France	0.0232	0.9768	1.2
R. gallica	Sgal-Leguevin-Mader-58	Rosa gallica L.	-	France	0.005	0.995	1.2
R. gallica	Sgal-Leguevin-Mader-63	Rosa gallica L.	-	France	0.0027	0.9973	1.2
R. gallica	Sgal-Leguevin-Mader-66	Rosa gallica L.	-	France	0.004	0.996	1.2
R. gallica	Sgal-Mison-01-1	Rosa gallica L.	-	France	0.9767	0.0233	1.1
R. gallica	Sgal-Mondonville-05-1	Rosa gallica L.	-	France	0.0505	0.9495	1.2
R. gallica	Sgal-Mondonville-07-1	Rosa gallica L.	-	France	0.0257	0.9743	1.2
R. gallica	Sgal-Morgon-05-1	Rosa gallica L.	-	France	0.8599	0.1401	1.1
R. gallica	Sgal-Morgon-05-2	Rosa gallica L.	-	France	0.6665	0.3335	1.1*
R. gallica	Sgal-Morgon-05-4	Rosa gallica L.	-	France	0.3537	0.6463	1.2*
R. gallica	Sgal-Morgon-06-1	Rosa gallica L.	-	France	0.3749	0.6251	1.2*
R. gallica	Sgal-Morgon-08-2	Rosa gallica L.	-	France	0.458	0.542	1.2*

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R. gallica	Sgal-Morgon-09-1	Rosa gallica L.	-	France	0.3895	0.6105	1.2*
R. gallica	Sgal-Neffes-01-2	Rosa gallica L.	-	France	0.9936	0.0064	1.1
R. gallica	Sgal-Neffes-01-6	Rosa gallica L.	-	France	0.9908	0.0092	1.1
R. gallica	Sgal-Neffes-02-8	Rosa gallica L.	-	France	0.9899	0.0101	1.1
R. gallica	Sgal-Pibrac-20-13	Rosa gallica L.	-	France	0.003	0.997	1.2
R. gallica	Sgal-Pibrac-20-16	Rosa gallica L.	-	France	0.0108	0.9892	1.2
R. gallica	Sgal-Pibrac-20-1	Rosa gallica L.	-	France	0.0031	0.9969	1.2
R. gallica	Sgal-Pibrac-20-3	Rosa gallica L.	-	France	0.003	0.997	1.2
R. gallica	Sgal-Pibrac-20-5	Rosa gallica L.	-	France	0.008	0.992	1.2
R. gallica	Sgal-Pibrac-20-6	Rosa gallica L.	-	France	0.0113	0.9887	1.2
R. gallica	Sgal-Pibrac-20-7	Rosa gallica L.	-	France	0.0059	0.9941	1.2
R. gallica	Sgal-Pibrac-21-7	Rosa gallica L.	-	France	0.0039	0.9961	1.2
R. gallica	Sgal-Pibrac-Grand-Perramond-198	Rosa gallica L.	-	France	0.0133	0.9867	1.2
R. gallica	Sgal-Pibrac-Grand-Perramond-223	Rosa gallica L.	-	France	0.0244	0.9756	1.2
R. gallica	Sgal-Pibrac-Grand-Perramond-759	Rosa gallica L.	-	France	0.0264	0.9736	1.2
R. gallica	Sgal-Pibrac-L-Escalette-46	Rosa gallica L.	-	France	0.0099	0.9901	1.2
R. gallica	Sgal-Plaisance-Du-Touch-Fonsorbe-D632-1136	Rosa gallica L.	-	France	0.0059	0.9941	1.2
R. gallica	Sgal-Plaisance-du-Touch-Lac-de-Bizarel-11	Rosa gallica L.	-	France	0.0059	0.9941	1.2
R. gallica	Sgal-Plaisance-du-Touch-Lac-de-Bizarel-2	Rosa gallica L.	-	France	0.0041	0.9959	1.2
R. gallica	Sgal-Plaisance-du-Touch-Lac-de-Bizarel-7	Rosa gallica L.	-	France	0.1279	0.8721	1.2
R. gallica	Sgal-Plaisance-du-Touch-RD82-secteur-B-962	Rosa gallica L.	-	France	0.008	0.992	1.2
R. gallica	Sgal-Plaisance-du-Touch-RD82-secteur-C-1129	Rosa gallica L.	-	France	0.003	0.997	1.2
R. gallica	Sgal-Plaisance-du-Touch-RD82-secteur-C-1132	Rosa gallica L.	-	France	0.0031	0.9969	1.2
R. gallica	Sgal-Plaisance-du-Touch-RD82-secteur-C-808	Rosa gallica L.	-	France	0.0031	0.9969	1.2
R. gallica	Sgal-Plaisance-du-Touch-Rue-Agricole-Perdiguier-786	Rosa gallica L.	-	France	0.0039	0.9961	1.2
R. gallica	Sgal-Plaisance-du-Touch-Rue-des-charmes-618	Rosa gallica L.	-	France	0.004	0.996	1.2
R. gallica	Sgal-Plaisance-du-Touch-Rue-des-charmes-633	Rosa gallica L.	-	France	0.009	0.991	1.2
R. gallica	Sgal-Plaisance-du-Touch-Rue-des-charmes-649	Rosa gallica L.	-	France	0.0031	0.9969	1.2
R. gallica	Sgal-Plaisance-du-Touch-Rue-de-la-solidarité-776	Rosa gallica L.	-	France	0.0045	0.9955	1.2
R. gallica	Sgal-Poucharramet-01-2	Rosa gallica L.	-	France	0.009	0.991	1.2
R. gallica	Sgal-Primelles-01-1	Rosa gallica L.	-	France	0.7571	0.2429	1.1*
R. gallica	Sgal-Primelles-02-2	Rosa gallica L.	-	France	0.5763	0.4237	1.1*
R. gallica	Sgal-Primelles-02-4	Rosa gallica L.	-	France	0.5768	0.4232	1.1*
R. gallica	Sgal-Revest-des-Brousses-01-3	Rosa gallica L.	-	France	0.9907	0.0093	1.1
R. gallica	Sgal-Revest-des-Brousses-02-1	Rosa gallica L.	-	France	0.9875	0.0125	1.1
R. gallica	Sgal-Revest-des-Brousses-02-7	Rosa gallica L.	-	France	0.9944	0.0056	1.1
R. gallica	Sgal-Ringendorf-A7	Rosa gallica L.	-	France	0.9926	0.0074	1.1
R. gallica	Sgal-Ringendorf-B4	Rosa gallica L.	-	France	0.9915	0.0085	1.1
R. gallica	Sgal-Ringendorf-G1	Rosa gallica L.	-	France	0.9914	0.0086	1.1
R. gallica	Sgal-Rosans-01-1	Rosa gallica L.	-	France	0.9697	0.0303	1.1
R. gallica	Sgal-Rosans-01-7	Rosa gallica L.	-	France	0.9834	0.0166	1.1
R. gallica	Sgal-Rosenwiller-A1	Rosa gallica L.	-	France	0.9883	0.0117	1.1
R. gallica	Sgal-Saint-Lys-Chemin-du-fustie-1152	Rosa gallica L.	-	France	0.0186	0.9814	1.2
R. gallica	Sgal-Saint-Lys-Chemin-du-fustie-1165	Rosa gallica L.	-	France	0.0037	0.9963	1.2
R. gallica	Sgal-Saint-Lys-Impasse-du-Prim-1143	Rosa gallica L.	-	France	0.004	0.996	1.2

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R. gallica	Sgal-Saint-Lys-Juste-23	Rosa gallica L.	-	France	0.3569	0.6431	1.2*
R. gallica	Sgal-Seiches-B1	Rosa gallica L.	-	France	0.0041	0.9959	1.2
R. gallica	Sgal-Seysses-RD12-746	Rosa gallica L.	-	France	0.0071	0.9929	1.2
R. gallica	Sgal-Seysses-RD50-725	Rosa gallica L.	-	France	0.0131	0.9869	1.2
R. gallica	Sgal-Seysses-RD50-728	Rosa gallica L.	-	France	0.014	0.986	1.2
R. gallica	Sgal-Seysses-RD50-736	Rosa gallica L.	-	France	0.2178	0.7822	1.2*
R. gallica	Sgal-Ste-Foy-St-Sulpice-2	Rosa gallica L.	-	France	0.4582	0.5418	1.2*
R. gallica	Sgal-St-Etienne-des-Orgues-01-1	Rosa gallica L.	-	France	0.9818	0.0182	1.1
R. gallica	Sgal-St-Genis-Pouilly-01-2	Rosa gallica L.	-	France	0.9929	0.0071	1.1
R. gallica	Sgal-St-Genis-Pouilly-02-2	Rosa gallica L.	-	France	0.9895	0.0105	1.1
R. gallica	Sgal-St-Genis-Pouilly-02-7	Rosa gallica L.	-	France	0.9651	0.0349	1.1
R. gallica	Sgal-Tallard-01-3	Rosa gallica L.	-	France	0.991	0.009	1.1
R. gallica	Sgal-Tallard-02-5	Rosa gallica L.	-	France	0.9919	0.0081	1.1
R. gallica	Sgal-Thil-La-Trougne-767	Rosa gallica L.	-	France	0.003	0.997	1.2
R. gallica	Sgal-Tournefeuille-02-2	Rosa gallica L.	-	France	0.004	0.996	1.2
R. gallica	Sgal-Tournefeuille-02-4	Rosa gallica L.	-	France	0.0037	0.9963	1.2
R. gallica	Sgal-Tournefeuille-02-6	Rosa gallica L.	-	France	0.008	0.992	1.2
R. gallica	Sgal-Tournefeuille-02-8	Rosa gallica L.	-	France	0.004	0.996	1.2
R. gallica	Sgal-Ville-la-Grand-01-3	Rosa gallica L.	-	France	0.9772	0.0228	1.1
R. gallica	Sgal-Villie-Morgon-01-1	Rosa gallica L.	-	France	0.3926	0.6074	1.2*
R. gallica	Sgal-Villie-Morgon-01-5	Rosa gallica L.	-	France	0.4013	0.5987	1.2*
R. gallica	Sgal-Villie-Morgon-01-7	Rosa gallica L.	-	France	0.6115	0.3885	1.1*
R. gallica	Sgal-Viry-01-1	Rosa gallica L.	-	France	0.9951	0.0049	1.1
R. gallica	Sgal-Viry-02-1	Rosa gallica L.	-	France	0.9885	0.0115	1.1
R. gallica	Sgal-Viry-02-4	Rosa gallica L.	-	France	0.9908	0.0092	1.1
R. gallica	Sgal-Viry-02-7	Rosa gallica L.	-	France	0.9837	0.0163	1.1
R. gallica	tetra-rgal-clo111	Rosa gallica L.	-	-	0.0069	0.9931	1.2
R. gallica	tetra-rgal-clo154	Rosa gallica L.	-	-	0.0055	0.9945	1.2
R. gallica	tetra-rgal-df-m73-d3	Rosa gallica L.	-	France	0.003	0.997	1.2
R. gallica	tetra-rgal-df-m73-d4	Rosa gallica L.	-	France	0.0044	0.9956	1.2
R. gallica	tetra-rgal-df-m73-d5	Rosa gallica L.	-	France	0.0037	0.9963	1.2
R. gallica	tetra-rgal-df-m73-d6	Rosa gallica L.	-	France	0.0061	0.9939	1.2
R. gallica	tetra-rgal-df-m73-d7	Rosa gallica L.	-	France	0.005	0.995	1.2
R. gallica	tetra-rgal-df-m82-d10	Rosa gallica L.	-	France	0.004	0.996	1.2
R. gallica	tetra-rgal-df-m82-d2	Rosa gallica L.	-	France	0.0031	0.9969	1.2
R. gallica	tetra-rgal-df-m82-d4	Rosa gallica L.	-	France	0.0041	0.9959	1.2
R. gallica	tetra-rgal-df-m82-d6	Rosa gallica L.	-	France	0.005	0.995	1.2
R. gallica	tetra-rgal-df-m82-d7	Rosa gallica L.	-	France	0.003	0.997	1.2
R. gallica	tetra-rgal-m82	Rosa gallica L.	-	France	0.0041	0.9959	1.2
R. gallica	tetra-rgal-morgo	Rosa gallica L.	-	France	0.4142	0.5858	1.2*

Appendix 4. STRUCTURE results of the subdivision of General Cluster 2. Genotypes were assigned to the most probable cluster MP > 0.5. Admixed individuals are marked with *.

Category	ID Individual	Species / Horticultural Group	Year	Country	MP cluster 2.1	MP cluster 2.2	Cluster
Cultivated	elisabeth-d-angleterre-10-F3	Unknown	1817	-	0.9325	0.0675	2.1
Cultivated	a-feuilles-de-chanvre-16-C9	Alba	1807	-	0.7089	0.2911	2.1*
Cultivated	a-longs-pedoncules-16-A1	Moss	1851	-	0.9325	0.0675	2.1
Cultivated	amelia-16-H2	Alba	1823	-	0.9306	0.0694	2.1
Cultivated	anais-16-F10	Hybrid Gallica	1817	-	0.001	0.999	2.2
Cultivated	anna-maria-de-montravel-11-G12	Polyantha	1879	-	0.0667	0.9333	2.2
Cultivated	baron-j-b-gonella-7-A10	Bourbon	1859	-	0.001	0.999	2.2
Cultivated	baronne-de-noirmont-7-G12	Bourbon	1861	-	0.001	0.999	2.2
Cultivated	baronne-prevost-14-F10	Hybrid Perpetual	1842	-	0.999	0.001	2.1
Cultivated	jacques-cartier-blanc-15-C5	Portland	1868	-	0.0791	0.9209	2.2
Cultivated	berenice-15-E4	Hybrid Gallica	1818	-	0.001	0.999	2.2
Cultivated	bernard-9-H6	Portland	1836	-	0.0337	0.9663	2.2
Cultivated	blairii-n-1-7-C10	Bourbon	1844	-	0.001	0.999	2.2
Cultivated	tri-littl	Unknown	Unknown	-	0.3834	0.6166	2.2*
Cultivated	blomsterhult-9-F7	Hybrid Gallica	Unknown	-	0.0187	0.9813	2.2
Cultivated	blush-hip-16-A3	Alba	1834	-	0.0292	0.9708	2.2
Cultivated	blush-noisette-15-E9	Noisette	1814	-	0.0011	0.9989	2.2
Cultivated	bon-silene-13-F5	Tea	1834	-	0.001	0.999	2.2
Cultivated	bougainville-15-A2	Noisette	1822	-	0.0013	0.9987	2.2
Cultivated	boula-de-nanteuil-15-F9	Hybrid Gallica	1834	-	0.9325	0.0675	2.1
Cultivated	bouquet-de-flore-8-G6	Bourbon	1833	-	0.001	0.999	2.2
Cultivated	bourbon-queen-8-E7	Bourbon	1834	-	0.001	0.999	2.2
Cultivated	burgundy-rose-16-C5	Hybrid Gallica	1664	-	0.9325	0.0675	2.1
Cultivated	catherine-guillot-8-A7	Bourbon	1860	-	0.001	0.999	2.2
Cultivated	celestial-9-A12	Alba	1739	-	0.4391	0.5609	2.2*
Cultivated	celine-9-D11	Bourbon	1824	-	0.0019	0.9981	2.2
Cultivated	charles-lawson-15-G9	Bourbon	1853	-	0.0019	0.9981	2.2
Cultivated	chloris-14-F11	Alba	1815	-	0.0674	0.9326	2.2
Cultivated	cocarde-pale-15-F8	Hybrid Gallica	1813	-	0.9325	0.0675	2.1
Cultivated	complicata-10-A2	Hybrid Gallica	1800	-	0.0037	0.9963	2.2
Cultivated	coupe-d-hebe-16-G10	Bourbon	1840	-	0.001	0.999	2.2
Cultivated	cramoisi-superieur-15-G7	China	1832	-	0.0011	0.9989	2.2
Cultivated	delambre-9-C10	Portland	1863	-	0.9316	0.0684	2.1
Cultivated	delille-15-F3	Moss	1852	-	0.0019	0.9981	2.2
Cultivated	di-abelc	Hybrid Tea	1894	-	0.001	0.999	2.2
Cultivated	di-coron	Unknown	Unknown	-	0.0395	0.9605	2.2
Cultivated	di-mvaum	Noisette	1875	-	0.001	0.999	2.2
Cultivated	di-parky	Unknown	Unknown	-	0.3282	0.6718	2.2*
Cultivated	di-singl	China	Unknown	-	0.0011	0.9989	2.2
Cultivated	di-thefa	Polyantha	Unknown	-	0.0672	0.9328	2.2
Cultivated	di-trann	Unknown	Unknown	-	0.001	0.999	2.2
Cultivated	double-white-16-G7	Hybrid Spinosissima	1808	-	0.999	0.001	2.1

Category	ID Individual	Species / Horticultural Group	Year	Country	MP cluster 2.1	MP cluster 2.2	Cluster
Cultivated	duc-de-crillon-16-H7	Bourbon	1860	-	0.0011	0.9989	2.2
Cultivated	duchess-of-sutherland-14-D10	Hybrid Tea	1839	-	0.001	0.999	2.2
Cultivated	edith-de-murat-7-F11	Bourbon	1858	-	0.001	0.999	2.2
Cultivated	rosa-multiflora-carnea-15-E6	Botanic Species	1804	-	0.0674	0.9326	2.2
Cultivated	felicite-parmentier-15-A5	Alba	1834	-	0.0019	0.9981	2.2
Cultivated	flocons-de-neige-9-B6	Polyantha	1898	-	0.0657	0.9343	2.2
Cultivated	flora-mac-ivor-16-F4	Hybrid Eglanteria	1895	-	0.6803	0.3197	2.1*
Cultivated	geant-des-batailles-14-A10	Hybrid Perpetual	1846	-	0.001	0.999	2.2
Cultivated	general-clerc-16-E3	Moss	1845	-	0.0259	0.9741	2.2
Cultivated	general-jacqueminot-14-C10	Hybrid Perpetual	1853	-	0.001	0.999	2.2
Cultivated	geschwind-s-nordland-n-2-16-A11	Hybrid Setigera	1910	-	0.0399	0.9601	2.2
Cultivated	geschwind-s-nordlandrose-9-F11	Hybrid Setigera	1884	-	0.1215	0.8785	2.2
Cultivated	geschwind-s-orden-9-H10	Hybrid Multiflora	1886	-	0.0323	0.9677	2.2
Cultivated	geschwind-s-schonste-15-D3	Hybrid Multiflora	1900	-	0.0192	0.9808	2.2
Cultivated	gewoehnliche-moss-rose-16-F3	Moss	1696	-	0.0334	0.9666	2.2
Cultivated	gourdault-8-F1	Bourbon	1859	-	0.001	0.999	2.2
Cultivated	hap-hob	Unknown	Unknown	-	0.0031	0.9969	2.2
Cultivated	heroine-de-vaucluse-9-H7	Hybrid Gallica	1863	-	0.0059	0.9941	2.2
Cultivated	hume-s-blush-tea-scented-china-14-D12	Tea	1809	-	0.0011	0.9989	2.2
Cultivated	jeune-henry-16-G5	Portland	1815	-	0.0019	0.9981	2.2
Cultivated	jules-margottin-15-E3	Hybrid Perpetual	1852	-	0.0019	0.9981	2.2
Cultivated	Konigin-von-Danemark-16-G3	Alba	1816	-	0.001	0.999	2.2
Cultivated	la-france-15-C2	Hybrid Tea	1867	-	0.001	0.999	2.2
Cultivated	la-noblesse-14-C12	Centifolia	1857	-	0.002	0.998	2.2
Cultivated	la-reine-15-H1	Hybrid Perpetual	1842	-	0.0019	0.9981	2.2
Cultivated	la-rubanee-15-A1	Hybrid Gallica	1839	-	0.9325	0.0675	2.1
Cultivated	las-casas-9-A10	Bourbon	1828	-	0.001	0.999	2.2
Cultivated	manette-8-G5	Hybrid Gallica	1820	-	0.9325	0.0675	2.1
Cultivated	les-saisons-d-italie-7-H11	Hybrid Gallica	1801	-	0.0072	0.9928	2.2
Cultivated	mannings-blush-9-E12	Botanic Species	1799	-	0.9325	0.0675	2.1
Cultivated	marietta-silva-tarouca-15-B4	Hybrid Multiflora	1925	-	0.0601	0.9399	2.2
Cultivated	meteor-16-G4	Noisette	1887	-	0.001	0.999	2.2
Cultivated	minette-9-D10	Centifolia	1819	-	0.2615	0.7385	2.2*
Cultivated	mle-blanche-lafitte-8-G1	Bourbon	1851	-	0.001	0.999	2.2
Cultivated	mme-nerard-16-D8	Bourbon	1838	-	0.001	0.999	2.2
Cultivated	mogador-15-E5	Portland	1819	-	0.0674	0.9326	2.2
Cultivated	niphetos-14-E10	Tea	1835	-	0.001	0.999	2.2
Cultivated	nuits-de-young-16-H1	Moss	1845	-	0.001	0.999	2.2
Cultivated	omer-pacha-16-A10	Bourbon	1863	-	0.001	0.999	2.2
Cultivated	petite-ecossaise-15-G1	Hybrid Spinosissima	1826	-	0.9985	0.0015	2.1
Cultivated	pierre-de-saint-cyr-8-D5	Bourbon	1838	-	0.0019	0.9981	2.2
Cultivated	poesie-9-A6	Hybrid Musk	1982	-	0.0275	0.9725	2.2
Cultivated	prince-albert-16-F8	Bourbon	1852	-	0.001	0.999	2.2
Cultivated	princesse-louise-16-B5	Hybrid Sempervirens	1829	-	0.4429	0.5571	2.2*
Cultivated	princesse-marie-9-B10	Hybrid Sempervirens	1829	-	0.1436	0.8564	2.2

Category	ID Individual	Species / Horticultural Group	Year	Country	MP cluster 2.1	MP cluster 2.2	Cluster
Cultivated	princesse-royale-16-B4	Moss	1846	-	0.0441	0.9559	2.2
Cultivated	rosa-stylosa-7-C9	Botanic Species	Botanic	-	0.9325	0.0675	2.1
Cultivated	roi-de-siam-15-C1	Tea	1825	-	0.4711	0.5289	2.2*
Cultivated	roi-des-pays-bas-16-A6	Damask	1824	-	0.7226	0.2774	2.1*
Cultivated	rosa-anemonae-9-B12	Hybrid Gallica	1814	-	0.7415	0.2585	2.1*
Cultivated	rosa-atropurpurea-15-H5	Hybrid Gallica	1786	-	0.2575	0.7425	2.2*
Cultivated	rosa-brunonii-10-H1	Botanic Species	Botanic	-	0.0443	0.9557	2.2
Cultivated	rosa-burgundiaca-8-F8	Centifolia	1664	-	0.9923	0.0077	2.1
Cultivated	rosa-cinnamomae-rugosa-7-D9	Botanic Species	Botanic	-	0.9978	0.0022	2.1
Cultivated	rosa-complicata-8-A9	Hybrid Gallica	Botanic	-	0.0031	0.9969	2.2
Cultivated	rosa-francofurtana-9-D12	Botanic Species	1774	-	0.9918	0.0082	2.1
Cultivated	rosa-gallica-caucasica-8-D8	Hybrid Gallica	Botanic	-	0.9325	0.0675	2.1
Cultivated	rosa-gallica-conditorum-8-E10	Hybrid Gallica	Botanic	-	0.4409	0.5591	2.2*
Cultivated	rosa-gallica-grandiflora-15-C6	Hybrid Gallica	1797	-	0.0625	0.9375	2.2
Cultivated	rosa-gallica-wallonic-8-F9	Hybrid Gallica	Botanic	-	0.0019	0.9981	2.2
Cultivated	rosa-hemisphaerica-15-G12	Botanic Species	1516	-	0.9325	0.0675	2.1
Cultivated	rosa-hypathea-15-H11	Centifolia	1843	-	0.9325	0.0675	2.1
Cultivated	rosa-iwara-14-H9	Hybrid Multiflora	1830	-	0.5521	0.4479	2.1*
Cultivated	rosa-majalis-plena-16-E12	Inter Species	1583	-	0.9983	0.0017	2.1
Cultivated	rosa-micrantha-sepium-8-A10	Botanic Species	1800	-	0.9325	0.0675	2.1
Cultivated	rosa-moschata-la-mosquenton-7-C8	Botanic Species	Unknown	-	0.9325	0.0675	2.1
Cultivated	rosa-moschata-umbrella-7-B8	Botanic Species	1912	-	0.002	0.998	2.2
Cultivated	rosa-moschata-yamada-7-D8	Botanic Species	Unknown	-	0.0073	0.9927	2.2
Cultivated	rosa-muscosa-japonica-9-B9	Moss	Botanic	-	0.0035	0.9965	2.2
Cultivated	rosa-odorata-spontanea-16-E5	Inter Species	Botanic	-	0.0706	0.9294	2.2
Cultivated	rosa-odorata-sweet-var-odorata-9-E8	Inter Species	1808	-	0.0782	0.9218	2.2
Cultivated	rosa-pendulina-plena-8-F6	Boursault	1883	-	0.2163	0.7837	2.2*
Cultivated	rosa-pomifera-16-H8	Botanic Species	1770	-	0.9325	0.0675	2.1
Cultivated	rosa-prolifera-16-A9	Hybrid Gallica	1817	-	0.9264	0.0736	2.1
Cultivated	rosa-simianjing-9-C8	Inter Species	Unknown	-	0.001	0.999	2.2
Cultivated	rosa-sulphurea-9-A9	Botanic Species	1516	-	0.9909	0.0091	2.1
Cultivated	rosa-yunzheng-xiawei-9-D8	Inter Species	Unknown	-	0.0011	0.9989	2.2
Cultivated	rose-edouard-8-D7	Bourbon	1819	-	0.0029	0.9971	2.2
Cultivated	rotrou-16-D4	Moss	1849	-	0.0117	0.9883	2.2
Cultivated	rouge-marbree-8-H1	Bourbon	1863	-	0.0021	0.9979	2.2
Cultivated	sir-joseph-paxton-15-F2	Bourbon	1852	-	0.001	0.999	2.2
Cultivated	solbakkens-9-G7	Moss	Unknown	-	0.0118	0.9882	2.2
Cultivated	tetra-black	Hybrid Tea	Unknown	-	0.0029	0.9971	2.2
Cultivated	tetra-conra	Hybrid Rugosa	1897	-	0.2111	0.7889	2.2*
Cultivated	tetra-inabi	Hybrid Perpetual	1906	-	0.001	0.999	2.2
Cultivated	tetra-meivh	Unknown	Unknown	-	0.001	0.999	2.2
Cultivated	tetra-nilbl	Hybrid Tea	Unknown	-	0.0016	0.9984	2.2
Cultivated	tetra-pault	Hybrid Wichurana	1900	-	0.5291	0.4709	2.1*
Cultivated	tetra-rfed	Botanic Species	1871	-	0.9985	0.0015	2.1
Cultivated	tetra-robus	Bourbon	Unknown	-	0.001	0.999	2.2

Category	ID Individual	Species / Horticultural Group	Year	Country	MP cluster 2.1	MP cluster 2.2	Cluster
Cultivated	tetra-sonia	Unknown	Unknown	-	0.0066	0.9934	2.2
Cultivated	tetra-tiffa	Unknown	Unknown	-	0.0011	0.9989	2.2
Cultivated	tetra-virgi	Unknown	Unknown	-	0.1747	0.8253	2.2
Cultivated	the-garland-9-C6	Hybrid Multiflora	1835	-	0.0014	0.9986	2.2
Cultivated	triomphe-de-l-exposition-16-F12	Hybrid Perpetual	1855	-	0.0011	0.9989	2.2
Cultivated	veloute-d-orleans-7-E12	Bourbon	1852	-	0.001	0.999	2.2
Cultivated	venusta-pendula-15-H3	Ayrshire	1776	-	0.0392	0.9608	2.2
Cultivated	vicomtesse-d-avesne-16-E10	Noisette	1847	-	0.0011	0.9989	2.2
Cultivated	williams-double-yellow-14-B10	Hybrid Foetida	1828	-	0.9981	0.0019	2.1
Other sp	10-jun-HON-11	Rosa jundzillii Besser	-	-	0.9325	0.0675	2.1
Other sp	10-pomz-HON-1	Rosa x pomazensis	-	-	0.9325	0.0675	2.1
Other sp	10-pomz-HON-3	Rosa x pomazensis	-	-	0.9325	0.0675	2.1
Other sp	10-pomz-HON-9	Rosa zalana Wiesb.	-	-	0.9325	0.0675	2.1
Other sp	11-cent-HON-1-C	Rosa x centifolia L.	-	-	0.1403	0.8597	2.2
Other sp	1-alb-SUI-1	Rosa x alba L.	-	-	0.7655	0.2345	2.1*
Other sp	1-arvhyb-SLO-4	Rosa arvensis x glauca ou villosa	-	-	0.9989	0.0011	2.1
Other sp	1-gla-SLO-4	Rosa glauca Pourr.	-	-	0.9316	0.0684	2.1
Other sp	1-pend-SLO-5	Rosa pendulina L.	-	-	0.9985	0.0015	2.1
Other sp	1-perv-VIRAZEIL-7	Rosa x pervirens	-	-	0.9315	0.0685	2.1
Other sp	1-rubig-FERRIERE-1	Rosa rubiginosa L.	-	-	0.9325	0.0675	2.1
Other sp	1-rubig-HON-1	Rosa rubiginosa L. sensu stricto	-	-	0.9325	0.0675	2.1
Other sp	1-sectcan-BEAUCOUZE-1	Rosa sect. Caninae	-	-	0.9325	0.0675	2.1
Other sp	1-sectcan-LAMARQUE-4	Rosa sect Caninae grp Agrestis	-	-	0.9325	0.0675	2.1
Other sp	1-semp-SAVIGNAC-1	Rosa sempervirens L.	-	-	0.9127	0.0873	2.1
Other sp	1-spi-SLO-6	Rosa spinosissima L.	-	-	0.9987	0.0013	2.1
Other sp	1-VERNAS-1	Rosa<a0>micrantha<a0>Borrer ex Sm.	-	-	0.9213	0.0787	2.1
Other sp	1-vil-SLO-1	Rosa villosa L. hyb.	-	-	0.999	0.001	2.1
Other sp	1-vil-SLO-2	Rosa villosa L.	-	-	0.999	0.001	2.1
Other sp	2-gla-SLO-1	Rosa glauca Pourr.	-	-	0.9281	0.0719	2.1
Other sp	2-gla-SLO-2	Rosa glauca Pourr.	-	-	0.9325	0.0675	2.1
Other sp	2-gla-SLO-4	Rosa glauca Pourr.	-	-	0.9325	0.0675	2.1
Other sp	4-jun-HON-6	Rosa jundzillii Besser	-	-	0.9325	0.0675	2.1
Other sp	4-pomz-HON-2	Rosa x pomazensis	-	-	0.9325	0.0675	2.1
Other sp	4-zala-HON-5	Rosa zalana var. zempleniensis	-	-	0.9325	0.0675	2.1
Other sp	ABI-01	Rosa abietina Gren. ex H.Christ	-	-	0.9325	0.0675	2.1
Other sp	ABY-01	Rosa abyssinica Lindl.	-	-	0.9964	0.0036	2.1
Other sp	AGR-02	Rosa agrestis Savi	-	-	0.9325	0.0675	2.1
Other sp	AGR-03	Rosa agrestis Savi	-	-	0.9325	0.0675	2.1
Other sp	ALB-02	Rosa albertii Regel	-	-	0.9976	0.0024	2.1
Other sp	BAN-03	Rosa banksiae Ait.	-	-	0.9962	0.0038	2.1
Other sp	BEG-01	Rosa beggeriana Schrenk	-	-	0.9989	0.0011	2.1
Other sp	BEL-01	Rosa bella Rehder & Wilson	-	-	0.9955	0.0045	2.1
Other sp	CAN-01	Rosa canina L.	-	-	0.9315	0.0685	2.1
Other sp	CAN-06	Rosa canina L.	-	-	0.0683	0.9317	2.2
Other sp	CAN-07	Rosa canina L.	-	-	0.9307	0.0693	2.1

Category	ID Individual	Species / Horticultural Group	Year	Country	MP cluster 2.1	MP cluster 2.2	Cluster
Other sp	CAR-03	Rosa carolina L.	-	-	0.9777	0.0223	2.1
Other sp	cent-3	Rosa x centifolia L.	-	-	0.0015	0.9985	2.2
Other sp	COL-01	Rosa columnifera	-	-	0.9325	0.0675	2.1
Other sp	DAC-01	Rosa davurica Pall.	-	-	0.9929	0.0071	2.1
Other sp	di-coule	Rosa multiflora	-	-	0.0675	0.9325	2.2
Other sp	di-guyon	Rosa multiflora	-	-	0.0675	0.9325	2.2
Other sp	di-hwic	H de Rosa wichurana	-	-	0.0675	0.9325	2.2
Other sp	di-oriot	Rosa multiflora	-	-	0.0675	0.9325	2.2
Other sp	di-ow9001-pf-ob-hwic	Descendance OW	-	-	0.0655	0.9345	2.2
Other sp	di-ow9004-pf-ob-hwic	Descendance OW	-	-	0.0672	0.9328	2.2
Other sp	di-ow9005-pf-ob-hwic	Descendance OW	-	-	0.0673	0.9327	2.2
Other sp	di-ow9006-pf-ob-hwic	Descendance OW	-	-	0.0672	0.9328	2.2
Other sp	di-ow9007-pf-ob-hwic	Descendance OW	-	-	0.0548	0.9452	2.2
Other sp	di-ow9008-pf-ob-hwic	Descendance OW	-	-	0.0671	0.9329	2.2
Other sp	di-ow9010-pf-ob-hwic	Descendance OW	-	-	0.0671	0.9329	2.2
Other sp	di-ow9011-pf-ob-hwic	Descendance OW	-	-	0.0657	0.9343	2.2
Other sp	di-ow9012-pf-ob-hwic	Descendance OW	-	-	0.0673	0.9327	2.2
Other sp	di-ow9034-pf-ob-hwic	Descendance OW	-	-	0.0653	0.9347	2.2
Other sp	di-pelle	Rosa multiflora	-	-	0.0675	0.9325	2.2
Other sp	di-pgabe	Rosa multiflora	-	-	0.0683	0.9317	2.2
Other sp	di-rcar	Rosa carolina	-	-	0.988	0.012	2.1
Other sp	di-rchi	Rosa chinensis spontanea	-	-	0.0683	0.9317	2.2
Other sp	di-rfor	Rosa forrestiana	-	-	0.9964	0.0036	2.1
Other sp	di-rglo	Rosa glomerata	-	-	0.0678	0.9322	2.2
Other sp	di-rgym	Rosa gymnocarpa	-	-	0.9989	0.0011	2.1
Other sp	di-rlae	Rosa laevigata	-	-	0.9405	0.0595	2.1
Other sp	di-rmaj	Rosa majalis	-	-	0.9986	0.0014	2.1
Other sp	di-rmos	Rosa moschata	-	-	0.9904	0.0096	2.1
Other sp	di-rodo	Rosa var odorata gigantea	-	-	0.0015	0.9985	2.2
Other sp	di-rper	Rosa persica	-	-	0.9982	0.0018	2.1
Other sp	di-rrox	Rosa roxburghii	-	-	0.989	0.011	2.1
Other sp	di-rrug	Rosa rugosa	-	-	0.9989	0.0011	2.1
Other sp	di-rseg	Rosa setigera	-	-	0.9959	0.0041	2.1
Other sp	di-rsem	Rosa sempervirens	-	-	0.9306	0.0694	2.1
Other sp	WIC-04	Rosa wichurana var. poteriifolia Koidz.	-	-	0.0674	0.9326	2.2
Other sp	XAN-05	Rosa xanthina Lindl.	-	-	0.999	0.001	2.1
Other sp	duma-1	Rosa x dumalis Bechst.	-	-	0.0049	0.9951	2.2
Other sp	ELI-01	Rosa elliptica Tausch	-	-	0.9325	0.0675	2.1
Other sp	FED-01	Rosa fedtschenkoana Regl.	-	-	0.999	0.001	2.1
Other sp	hexa-ralb	Rosa alba	-	-	0.9325	0.0675	2.1
Other sp	HUG-01	Rosa hugonis Hemsl.	-	-	0.999	0.001	2.1
Other sp	INO-01	Rosa inodora Fr.	-	-	0.9325	0.0675	2.1
Other sp	JUN-01	Rosa jundzillii Besser	-	-	0.9325	0.0675	2.1
Other sp	LON-03	Rosa longicuspis Bertol.	-	-	0.0731	0.9269	2.2
Other sp	LUC-01	Rosa luciae	-	-	0.1191	0.8809	2.2

Category	ID Individual	Species / Horticultural Group	Year	Country	MP cluster 2.1	MP cluster 2.2	Cluster
Other sp	MAC-03	Rosa macrophylla Lindl.	-	-	0.9925	0.0075	2.1
Other sp	MAI-02	Rosa marretii H. L<e9>v.	-	-	0.9985	0.0015	2.1
Other sp	MAJ-01	Rosa majalis Herrm.	-	-	0.9988	0.0012	2.1
Other sp	MAJ-02	Rosa majalis Herrm.	-	-	0.9986	0.0014	2.1
Other sp	MAJ-04	Rosa majalis Herrm.	-	-	0.9987	0.0013	2.1
Other sp	MAR-02	Rosa marginata Wallr.	-	-	0.9657	0.0343	2.1
Other sp	MAX-01	Rosa maximowicziana R<e9>g.	-	-	0.0779	0.9221	2.2
Other sp	MIC-01	Rosa micrantha Borrer ex Sm.	-	-	0.9325	0.0675	2.1
Other sp	MOL-01	Rosa mollis Sm.	-	-	0.9369	0.0631	2.1
Other sp	MOS-01	Rosa moschata Herrm.	-	-	0.9325	0.0675	2.1
Other sp	MOS-02	Rosa moschata Herrm.	-	-	0.0627	0.9373	2.2
Other sp	MUA-01	Rosa multiflora Thunb.	-	-	0.0675	0.9325	2.2
Other sp	NAN-01	Rosa nanothamnus var. litvinovi	-	-	0.9989	0.0011	2.1
Other sp	NIX-01	Rosa x nitidula Besser	-	-	0.9325	0.0675	2.1
Other sp	OXY-01	Rosa oxyodon Boiss.	-	-	0.9961	0.0039	2.1
Other sp	PEN-03	Rosa pendulina L.	-	-	0.9323	0.0677	2.1
Other sp	penta-rdum	Rosa dumalis	-	-	0.9325	0.0675	2.1
Other sp	PIM-03	Rosa spinossissima L.	-	-	0.998	0.002	2.1
Other sp	PRI-03	Rosa primula Boulenger	-	-	0.999	0.001	2.1
Other sp	RUG-01	Rosa rugosa Thunb.	-	-	0.9989	0.0011	2.1
Other sp	RUG-02	Rosa rugosa Thunb.	-	-	0.0675	0.9325	2.2
Other sp	RUS-01	Rosa ruscinonensis	-	-	0.4237	0.5763	2.2*
Other sp	SEF-01	Rosa serafinii Viv.	-	-	0.9308	0.0692	2.1
Other sp	SEM-01	Rosa sempervirens L.	-	-	0.9324	0.0676	2.1
Other sp	SEP-04	Rosa setipoda Hemsl. & Wils.	-	-	0.9975	0.0025	2.1
Other sp	SPI-05	Rosa spinosissima L.	-	-	0.9989	0.0011	2.1
Other sp	tetra-ow9001-ow9007	Tetrasynthetique	-	-	0.0628	0.9372	2.2
Other sp	tetra-rmac	Rosa macrophylla	-	-	0.999	0.001	2.1
Other sp	TOA-02	Rosa tomentosa Sm.	-	-	0.9339	0.0661	2.1
Other sp	TOM-02	Rosa tomentella	-	-	0.9325	0.0675	2.1
Other sp	VIL-01	Rosa villosa L.	-	-	0.9328	0.0672	2.1
Other sp	VIR-02	Rosa virginiana Mill.	-	-	0.9944	0.0056	2.1
Other sp	WIC-03	Rosa wichurana var. wichurana	-	-	0.0684	0.9316	2.2
R. gallica	Sgal-10-ALL-4	Rosa gallica L.	-	Germany	0.8183	0.1817	2.1
R. gallica	Sgal-14-POL-1	Rosa gallica L.	-	Poland	0.931	0.069	2.1
R. gallica	Sgal-14-POL-2	Rosa gallica L.	-	Poland	0.9305	0.0695	2.1
R. gallica	Sgal-14-POL-4	Rosa gallica L.	-	Poland	0.928	0.072	2.1
R. gallica	Sgal-1-ESP-1	Rosa gallica L.	-	Spain	0.999	0.001	2.1
R. gallica	Sgal-1-SLO-1	Rosa gallica L.	-	Slovenia	0.9325	0.0675	2.1
R. gallica	Sgal-1-SLO-6	Rosa gallica L.	-	Slovenia	0.9325	0.0675	2.1
R. gallica	Sgal-2-BOS-1	Rosa gallica L.	-	Bosnia	0.0876	0.9124	2.2
R. gallica	Sgal-2-ESP-1	Rosa gallica L.	-	Spain	0.0682	0.9318	2.2
R. gallica	Sgal-2-SLO-1	Rosa gallica L.	-	Slovenia	0.9325	0.0675	2.1
R. gallica	Sgal-2-SLO-2	Rosa gallica L.	-	Slovenia	0.9325	0.0675	2.1
R. gallica	Sgal-3-BOS-1	Rosa gallica L.	-	Bosnia	0.9325	0.0675	2.1

Category	ID Individual	Species / Horticultural Group	Year	Country	MP cluster 2.1	MP cluster 2.2	Cluster
R. gallica	Sgal-4-CRO-1	Rosa gallica L.	-	Croatia	0.9325	0.0675	2.1
R. gallica	Sgal-4-CRO-4	Rosa gallica L.	-	Croatia	0.9315	0.0685	2.1
R. gallica	Sgal-7-CRO-3	Rosa gallica L.	-	Croatia	0.9325	0.0675	2.1
R. gallica	Sgal-Plaisance-du-Touch-RD82-secteur-B-811	Rosa gallica L.	-	France	0.9325	0.0675	2.1
R. gallica	Sgal-Verneugheol-2	Rosa gallica L.	-	France	0.9325	0.0675	2.1
R. gallica	Sgal-Verneugheol-4	Rosa gallica L.	-	France	0.9325	0.0675	2.1
R. gallica	Sgal-Verneugheol-6	Rosa gallica L.	-	France	0.9325	0.0675	2.1
R. gallica	Sgal-Verneugheol-8	Rosa gallica L.	-	France	0.9325	0.0675	2.1

Appendix 5. STRUCTURE results on the cultivated compartment. Genotypes were assigned to the most probable cluster MP > 0.5. Admixed individuals are marked with *.

ID Individual	Complete_hort_Group	MP Cluster 1	MP Cluster 2	MP Cluster 3	Cluster
elisabeth-d-angleterre-10-F3	Unknown	0.0013	0.002	0.9967	3
abrahamsgarden-9-A8	Hybrid Gallica	0.3802	0.6138	0.006	2*
adele-7-C12	Hybrid Gallica	0.001	0.998	0.001	2
adele-heu-10-A4	Hybrid Gallica	0.001	0.998	0.001	2
adele-pavie-16-G2	Moss	0.3018	0.6972	0.001	2*
adele-prevost-9-E2	Hybrid Gallica	0.351	0.648	0.001	2*
a-feuilles-de-chanvre-16-C9	Alba	0.0042	0.2951	0.7007	3*
agar-16-H4	Hybrid Gallica	0.001	0.998	0.001	2
agatha-16-B6	Hybrid Gallica	0.0086	0.989	0.0024	2
agathe-fatime-9-B1	Hybrid Gallica	0.001	0.997	0.002	2
aimable-amie-9-G2	Hybrid Gallica	0.0234	0.9736	0.003	2
alain-blanchard-7-F9	Hybrid Gallica	0.001	0.997	0.002	2
alector-cramoisi-15-H7	Hybrid Gallica	0.001	0.998	0.001	2
a-longs-pedoncules-16-A1	Moss	0.0041	0.002	0.9939	3
ambroise-pare-16-C6	Hybrid Gallica	0.001	0.998	0.001	2
amelia-16-H2	Alba	0.0054	0.0051	0.9895	3
amelie-de-mansfield-16-G8	Hybrid Gallica	0.001	0.998	0.001	2
anais-16-F10	Hybrid Gallica	0.888	0.111	0.001	1
incomparable-d-auteuil-10-E1	Centifolia	0.001	0.997	0.002	2
angelique-quetier-14-G10	Moss	0.001	0.998	0.001	2
anna-maria-de-montravel-11-G12	Polyantha	0.996	0.002	0.002	1
antonia-d-ormois-15-B5	Hybrid Gallica	0.001	0.998	0.001	2
ariadne-8-C10	Hybrid Gallica	0.0012	0.9978	0.001	2
aristobule-16-B1	Moss	0.001	0.998	0.001	2
armide-8-A11	Alba	0.1544	0.8426	0.003	2
bacchante-15-A9	Hybrid Gallica	0.001	0.998	0.001	2
baron-de-wassenaer-16-E4	Moss	0.3162	0.6818	0.002	2*
baron-j-b-gonella-7-A10	Bourbon	0.7972	0.201	0.0018	1*
baronne-de-noirmont-7-G12	Bourbon	0.9227	0.0743	0.003	1
baronne-prevost-14-F10	Hybrid Perpetual	0.001	0.001	0.998	3
beau-narcisse-8-F5	Hybrid Gallica	0.3922	0.6068	0.001	2*
beaute-virginale-16-E9	Damask	0.003	0.5293	0.4677	2*

ID Individual	Complete_hort_Group	MP Cluster 1	MP Cluster 2	MP Cluster 3	Cluster
belle-de-segur-16-D6	Alba	0.161	0.835	0.004	2
belle-de-yebles-9-F9	Hybrid Gallica	0.003	0.995	0.002	2
belle-helene-15-B9	Hybrid Gallica	0.001	0.998	0.001	2
belle-herminie-15-C9	Hybrid Gallica	0.001	0.997	0.002	2
ombre-superbe-7-B12	Hybrid Gallica	0.001	0.998	0.001	2
jacques-cartier-blanc-15-C5	Portland	0.3721	0.003	0.6249	3*
berenice-15-E4	Hybrid Gallica	0.995	0.004	0.001	1
bernard-9-H6	Portland	0.2238	0.7696	0.0066	2*
bijou-des-amateurs-16-A5	Hybrid Gallica	0.001	0.998	0.001	2
eugenie-de-guinoisseau-16-F1	Moss	0.1194	0.8786	0.002	2
blairii-n-1-7-C10	Bourbon	0.9678	0.0302	0.002	1
blanc-de-vibert-15-E1	Portland	0.0043	0.9927	0.003	2
tri-littl	Unknown	0.5022	0.0066	0.4912	1*
blanche-fleur-8-G12	Centifolia	0.002	0.9969	0.0011	2
blomsterhult-9-F7	Hybrid Gallica	0.4445	0.5481	0.0074	2*
blush-damask-16-B12	Damask	0.2796	0.7137	0.0067	2*
blush-hip-16-A3	Alba	0.997	0.001	0.002	1
blush-noisette-15-E9	Noisette	0.9969	0.002	0.0011	1
bon-silene-13-F5	Tea	0.997	0.001	0.002	1
bougainville-15-A2	Noisette	0.9978	0.0012	0.001	1
boula-de-nanteuil-15-F9	Hybrid Gallica	0.001	0.002	0.997	3
bouquet-de-flore-8-G6	Bourbon	0.9946	0.0044	0.001	1
bourbon-queen-8-E7	Bourbon	0.7036	0.2944	0.002	1*
brennus-8-D12	Hybrid Gallica	0.3334	0.6655	0.0011	2*
burgundy-rose-16-C5	Hybrid Gallica	0.001	0.002	0.997	3
camaieux-9-E11	Hybrid Gallica	0.001	0.998	0.001	2
capitaine-john-ingram-16-D1	Hybrid Gallica	0.001	0.998	0.001	2
catherine-guillot-8-A7	Bourbon	0.9936	0.0054	0.001	1
celanire-8-G2	Alba	0.3128	0.6861	0.0011	2*
celestial-9-A12	Alba	0.0338	0.4839	0.4822	*
celine-9-D11	Bourbon	0.7127	0.2853	0.002	1*
celsiana-16-F5	Damask	0.0056	0.9884	0.006	2
charles-lawson-15-G9	Bourbon	0.406	0.593	0.001	2*
chloris-14-F11	Alba	0.998	0.001	0.001	1
cocarde-pale-15-F8	Hybrid Gallica	0.001	0.003	0.996	3
commandant-beaurepaire-15-H9	Hybrid Perpetual	0.4526	0.5464	0.001	2*
complicata-10-A2	Hybrid Gallica	0.5937	0.4012	0.0051	1*
comte-de-chambord-10-F2	Portland	0.2726	0.7254	0.002	2*
comte-foy-de-rouen-10-C1	Hybrid Gallica	0.001	0.998	0.001	2
comtesse-de-murinais-15-F1	Moss	0.006	0.9637	0.0303	2
coralie-16-B3	Moss	0.001	0.998	0.001	2
cornet-7-A11	Damask	0.3015	0.6965	0.002	2*
cosimo-ridolphi-15-A8	Hybrid Gallica	0.001	0.998	0.001	2
coupe-d-hebe-16-G10	Bourbon	0.9925	0.0065	0.001	1
cramoisi-des-alpes-15-E7	Hybrid Gallica	0.001	0.998	0.001	2

ID Individual	Complete_hort_Group	MP Cluster 1	MP Cluster 2	MP Cluster 3	Cluster
cramoisi-picote-16-E6	Hybrid Gallica	0.001	0.998	0.001	2
cramoisi-superieur-15-G7	China	0.998	0.001	0.001	1
cuisse-de-nymphe-emue-15-A10	Alba	0.003	0.5054	0.4916	2*
dalstorp-9-D7	Hybrid Gallica	0.0049	0.9931	0.002	2
daphne-15-C7	Hybrid Gallica	0.001	0.997	0.002	2
darius-8-C3	Hybrid Gallica	0.001	0.998	0.001	2
de-la-maitre-ecole-9-F3	Hybrid Gallica	0.001	0.998	0.001	2
delambre-9-C10	Portland	0.0016	0.0025	0.9959	3
delille-15-F3	Moss	0.4009	0.5971	0.002	2*
dembrowski-8-H6	Portland	0.0013	0.9977	0.001	2
desiree-parmentier-7-G8	Hybrid Gallica	0.0014	0.9956	0.003	2
di-abelc	Hybrid Tea	0.9978	0.001	0.0012	1
di-coron	Unknown	0.9979	0.001	0.0011	1
di-mvaum	Noisette	0.998	0.001	0.001	1
di-parky	Unknown	0.3289	0.0087	0.6624	3*
di-singl	China	0.998	0.001	0.001	1
di-thefa	Polyantha	0.9938	0.0032	0.003	1
di-trann	Unknown	0.9887	0.0103	0.001	1
dom-pedro-16-C3	Alba	0.3349	0.6634	0.0017	2*
dona-sol-15-B10	Hybrid Gallica	0.001	0.998	0.001	2
double-white-16-G7	Hybrid Spinosissima	0.001	0.001	0.998	3
duc-d-angouleme-15-H4	Centifolia	0.4396	0.5584	0.002	2*
gonsalve-8-C2	Hybrid Gallica	0.001	0.998	0.001	2
duc-de-crillon-16-H7	Bourbon	0.9903	0.0077	0.002	1
duc-de-guiche-9-B3	Hybrid Gallica	0.001	0.998	0.001	2
duchesse-d-angouleme-8-F12	Hybrid Gallica	0.1925	0.8065	0.001	2
duchesse-de-berry-15-C10	Hybrid Gallica	0.001	0.998	0.001	2
duchesse-de-buccleugh-9-C1	Hybrid Gallica	0.001	0.998	0.001	2
duchesse-de-montebello-15-D10	Hybrid Gallica	0.001	0.9979	0.0011	2
duchesse-de-portland-14-G11	Portland	0.2967	0.7013	0.002	2*
duchess-of-sutherland-14-D10	Hybrid Tea	0.995	0.004	0.001	1
edith-de-murat-7-F11	Bourbon	0.9978	0.0012	0.001	1
rosa-multiflora-carnea-15-E6	Botanic Species	0.8966	0.0607	0.0427	1
eulalie-lebrun-16-B8	Hybrid Gallica	0.001	0.998	0.001	2
eveque-16-F6	Hybrid Gallica	0.331	0.668	0.001	2*
felicite-parmentier-15-A5	Alba	0.387	0.611	0.002	2*
pergolese-16-C12	Portland	0.001	0.998	0.001	2
flocons-de-neige-9-B6	Polyantha	0.997	0.001	0.002	1
flora-mac-ivor-16-F4	Hybrid Eglanteria	0.2668	0.0103	0.7229	3*
foliacee-16-G1	Centifolia	0.0021	0.9918	0.0061	2
frankfurt-9-C3	Hybrid Gallica	0.005	0.6558	0.3392	2*
fulgens-gallique-15-H2	Hybrid Gallica	0.3031	0.6949	0.002	2*
geant-des-batailles-14-A10	Hybrid Perpetual	0.9701	0.0289	0.001	1
general-clerc-16-E3	Moss	0.9733	0.009	0.0177	1
general-jacqueminot-14-C10	Hybrid Perpetual	0.9884	0.0106	0.001	1

ID Individual	Complete_hort_Group	MP Cluster 1	MP Cluster 2	MP Cluster 3	Cluster
general-kleber-15-C3	Moss	0.002	0.9932	0.0048	2
geschwind-s-nordland-n-2-16-A11	Hybrid Setigera	0.7201	0.2789	0.001	1*
geschwind-s-nordlandrose-9-F11	Hybrid Setigera	0.3457	0.4685	0.1858	*
geschwind-s-orden-9-H10	Hybrid Multiflora	0.6092	0.3878	0.003	1*
geschwind-s-schonste-15-D3	Hybrid Multiflora	0.9959	0.003	0.0011	1
gewoehnliche-moss-rose-16-F3	Moss	0.3822	0.6148	0.003	2*
gourdault-8-F1	Bourbon	0.9916	0.0054	0.003	1
grand-cramoisi-8-B2	Hybrid Gallica	0.001	0.998	0.001	2
grande-cramoisi-10-D1	Hybrid Gallica	0.001	0.998	0.001	2
pourpre-charmant-15-B8	Hybrid Gallica	0.001	0.998	0.001	2
hap-hob	Unknown	0.9978	0.001	0.0012	1
heroine-de-vaucluse-9-H7	Hybrid Gallica	0.5059	0.4911	0.003	1*
hume-s-blush-tea-scented-china-14-D12	Tea	0.998	0.001	0.001	1
imperatrice-josephine-15-E10	Hybrid Gallica	0.002	0.7579	0.2401	2*
indigo-14-B12	Portland	0.002	0.996	0.002	2
jacques-cartier-10-G2	Portland	0.2411	0.7579	0.001	2*
jenny-duval-15-G10	Hybrid Gallica	0.001	0.997	0.002	2
jeune-henry-16-G5	Portland	0.6702	0.3283	0.0015	1*
josephine-ritter-15-A4	Hybrid Multiflora	0.2157	0.7833	0.001	2*
jules-margottin-15-E3	Hybrid Perpetual	0.4533	0.5447	0.002	2*
julie-krudner-15-D12	Portland	0.002	0.996	0.002	2
Konigin-von-Danemark-16-G3	Alba	0.992	0.006	0.002	1
la-belle-sultane-15-G3	Hybrid Gallica	0.001	0.998	0.001	2
la-france-15-C2	Hybrid Tea	0.9922	0.0058	0.002	1
la-maculee-9-H2	Hybrid Gallica	0.001	0.998	0.001	2
la-noblesse-14-C12	Centifolia	0.4588	0.5392	0.002	2*
l-ardoisee-9-D1	Hybrid Gallica	0.001	0.998	0.001	2
la-reine-15-H1	Hybrid Perpetual	0.4908	0.5072	0.002	2*
la-rubanee-15-A1	Hybrid Gallica	0.001	0.002	0.997	3
las-casas-9-A10	Bourbon	0.99	0.009	0.001	1
lea-15-H10	Hybrid Gallica	0.005	0.993	0.002	2
leda-8-B12	Damask	0.0039	0.9941	0.002	2
le-loberde-7-H10	Moss	0.002	0.996	0.002	2
le-rire-niais-9-H1	Centifolia	0.001	0.998	0.001	2
manette-8-G5	Hybrid Gallica	0.001	0.002	0.997	3
les-saisons-d-italie-7-H11	Hybrid Gallica	0.4233	0.5733	0.0034	2*
lycoris-9-B2	Hybrid Gallica	0.001	0.998	0.001	2
maiden-s-blush-16-G6	Alba	0.0027	0.5128	0.4845	2*
mannings-blush-9-E12	Botanic Species	0.0012	0.002	0.9968	3
marie-de-saint-jean-8-H7	Portland	0.001	0.9978	0.0012	2
marietta-silva-tarouca-15-B4	Hybrid Multiflora	0.997	0.001	0.002	1
marie-louise-9-A2	Damask	0.001	0.998	0.001	2
meteor-16-G4	Noisette	0.9931	0.0059	0.001	1
mignonne-charmante-8-B1	Moss	0.2802	0.7178	0.002	2*
minette-9-D10	Centifolia	0.0861	0.5174	0.3965	2*

ID Individual	Complete_hort_Group	MP Cluster 1	MP Cluster 2	MP Cluster 3	Cluster
mle-blanche-lafitte-8-G1	Bourbon	0.997	0.002	0.001	1
mme-hardy-9-C11	Damask	0.004	0.9934	0.0026	2
mme-nerard-16-D8	Bourbon	0.9978	0.0012	0.001	1
mogador-15-E5	Portland	0.998	0.001	0.001	1
moise-15-F5	Hybrid Gallica	0.1675	0.8315	0.001	2
napoleon-8-C1	Hybrid Gallica	0.001	0.998	0.001	2
niphetos-14-E10	Tea	0.7875	0.2115	0.001	1*
nouveau-monde-8-A1	Hybrid Gallica	0.2769	0.7221	0.001	2*
nouveau-rouge-10-D3	Hybrid Gallica	0.001	0.998	0.001	2
nouvelle-transparente-9-D9	Hybrid Gallica	0.1265	0.8725	0.001	2
nuits-de-young-16-H1	Moss	0.996	0.003	0.001	1
tetra-oeill	Damask	0.003	0.995	0.002	2
oeillet-double-16-H5	Hybrid Gallica	0.001	0.998	0.001	2
omer-pacha-16-A10	Bourbon	0.997	0.002	0.001	1
paeonienrose-10-H3	Hybrid Gallica	0.017	0.981	0.002	2
parure-des-vierges-8-E1	Hybrid Gallica	0.3906	0.6084	0.001	2*
petite-ecossaise-15-G1	Hybrid Spinosissima	0.0028	0.004	0.9932	3
petite-lisette-15-G5	Alba	0.0034	0.9956	0.001	2
pierre-de-saint-cyr-8-D5	Bourbon	0.9819	0.01	0.0081	1
poesie-9-A6	Hybrid Musk	0.9963	0.0017	0.002	1
pompon-panache-15-D2	Hybrid Gallica	0.002	0.997	0.001	2
prince-albert-16-F8	Bourbon	0.996	0.003	0.001	1
princesse-louise-16-B5	Hybrid Sempervirens	0.4329	0.0189	0.5482	3*
princesse-marie-9-B10	Hybrid Sempervirens	0.2783	0.099	0.6227	3*
princesse-royale-16-B4	Moss	0.9942	0.0019	0.0039	1
rosa-stylosa-7-C9	Botanic Species	0.002	0.003	0.995	3
provins-marbre-15-C8	Hybrid Gallica	0.001	0.998	0.001	2
provins-renoncule-15-E11	Hybrid Gallica	0.001	0.9978	0.0012	2
reine-des-centfeuilles-14-F12	Centifolia	0.0051	0.9939	0.001	2
reine-des-mousseuses-16-C4	Moss	0.001	0.998	0.001	2
reverend-h-d-ombrain-8-E2	Bourbon	0.003	0.996	0.001	2
roi-de-siam-15-C1	Tea	0.5262	0.003	0.4708	1*
roi-des-pays-bas-16-A6	Damask	0.0039	0.3065	0.6896	3*
rosa-andersonii-15-C4	Inter Species	0.005	0.5217	0.4733	2*
rosa-anemonae-9-B12	Hybrid Gallica	0.1372	0.0507	0.8121	3
rosa-atropurpurea-15-H5	Hybrid Gallica	0.0274	0.801	0.1716	2
rosa-brunonii-10-H1	Botanic Species	0.4152	0.002	0.5828	3*
rosa-burgundiaca-8-F8	Centifolia	0.0036	0.0164	0.98	3
rosa-centifolia-cristata-15-F6	Centifolia	0.0072	0.9908	0.002	2
rosa-centifolia-major-9-C9	Centifolia	0.1286	0.8674	0.004	2
rosa-centifolia-parvifolia-8-B7	Hybrid Gallica	0.001	0.998	0.001	2
rosa-centifolia-variegata-8-H4	Centifolia	0.1924	0.8066	0.001	2
rosa-cinnamomae-rugosa-7-D9	Botanic Species	0.002	0.003	0.995	3
rosa-complicata-8-A9	Hybrid Gallica	0.5649	0.4316	0.0035	1*
rosa-dupontii-8-H9	Inter Species	0.076	0.9214	0.0026	2

ID Individual	Complete_hort_Group	MP Cluster 1	MP Cluster 2	MP Cluster 3	Cluster
rosa-francofurtana-9-D12	Botanic Species	0.0041	0.001	0.9949	3
rosa-gallica-15-B6	Botanic Species	0.002	0.9964	0.0016	2
rosa-gallica-8-G7	Botanic Species	0.0029	0.8753	0.1218	2
rosa-gallica-caucasica-8-D8	Hybrid Gallica	0.001	0.0027	0.9963	3
rosa-gallica-conditorum-8-E10	Hybrid Gallica	0.003	0.7267	0.2703	2*
rosa-gallica-forme-d-epire-10-A3	Hybrid Gallica	0.0068	0.7727	0.2205	2*
rosa-gallica-grandiflora-15-C6	Hybrid Gallica	0.8396	0.0175	0.1429	1
rosa-gallica-huilii-9-G3	Hybrid Gallica	0.0022	0.9968	0.001	2
rosa-gallica-incarnata-8-G11	Hybrid Gallica	0.002	0.9616	0.0364	2
rosa-gallica-poumi-8-D6	Hybrid Gallica	0.3305	0.6685	0.001	2*
rosa-gallica-pumila-8-E9	Hybrid Gallica	0.004	0.7654	0.2306	2*
rosa-gallica-tricolore-16-C7	Hybrid Gallica	0.001	0.9979	0.0011	2
rosa-gallica-velutinaeflora-8-E5	Botanic Species	0.002	0.6627	0.3353	2*
rosa-gallica-wallonic-8-F9	Hybrid Gallica	0.6867	0.3113	0.002	1*
rosa-hemisphaerica-15-G12	Botanic Species	0.001	0.003	0.996	3
rosa-hypathea-15-H11	Centifolia	0.001	0.002	0.997	3
rosa-iwara-14-H9	Hybrid Multiflora	0.3687	0.002	0.6293	3*
rosa-macrantha-8-C9	Hybrid Gallica	0.0089	0.7442	0.247	2*
rosa-majalis-plena-16-E12	Inter Species	0.0011	0.001	0.9979	3
rosa-micrantha-sepium-8-A10	Botanic Species	0.0028	0.0058	0.9914	3
rosa-moschata-la-mosquenton-7-C8	Botanic Species	0.001	0.0042	0.9948	3
rosa-moschata-umbrella-7-B8	Botanic Species	0.9194	0.0105	0.0701	1
rosa-moschata-yamada-7-D8	Botanic Species	0.5228	0.4752	0.002	1*
rosa-mundi-selfcoloured-16-D7	Hybrid Gallica	0.001	0.998	0.001	2
rosa-muscipula-8-F7	Hybrid Gallica	0.0019	0.9941	0.004	2
rosa-muscosa-japonica-9-B9	Moss	0.5738	0.4183	0.0079	1*
rosa-odorata-spontanea-16-E5	Inter Species	0.32	0.001	0.679	3*
rosa-odorata-sweet-var-odorata-9-E8	Inter Species	0.5282	0.0143	0.4575	1*
rosa-pendulina-plena-8-F6	Boursault	0.7165	0.005	0.2785	1*
rosa-pomifera-16-H8	Botanic Species	0.002	0.003	0.995	3
rosa-prolifera-16-A9	Hybrid Gallica	0.003	0.1853	0.8117	3
rosa-proliferea-10-C2	Centifolia	0.002	0.996	0.002	2
rosa-simianjing-9-C8	Inter Species	0.995	0.003	0.002	1
rosa-sublaevis-9-H8	Inter Species	0.002	0.9851	0.0129	2
rosa-sulphurea-9-A9	Botanic Species	0.005	0.001	0.994	3
rosa-sylvatica-8-C8	Inter Species	0.0694	0.928	0.0026	2
rosa-villosa-recondita-7-A9	Botanic Species	0.0761	0.8827	0.0412	2
rosa-yunzheng-xiawei-9-D8	Inter Species	0.995	0.003	0.002	1
rose-de-provins-16-E7	Botanic Species	0.001	0.998	0.001	2
rose-de-rescht-8-C4	Portland	0.2182	0.7798	0.002	2*
rose-edouard-13-E5	Bourbon	0.0135	0.9768	0.0097	2
rose-edouard-8-D7	Bourbon	0.8848	0.1115	0.0037	1
rotrou-16-D4	Moss	0.9951	0.001	0.0039	1
rouge-marbree-8-H1	Bourbon	0.4738	0.5242	0.002	2*
roxelane-16-C10	Hybrid China	0.2861	0.7129	0.001	2*

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sidonie-8-C7	Hybrid Perpetual	0.3019	0.697	0.0011	2*
sir-joseph-paxton-15-F2	Bourbon	0.99	0.008	0.002	1
solbakkens-9-G7	Moss	0.2731	0.7148	0.0121	2*
soleil-brillant-10-B3	Hybrid Gallica	0.001	0.998	0.001	2
spencer-8-E12	Hybrid Perpetual	0.2546	0.7441	0.0013	2*
surpasse-tout-10-A1	Hybrid Gallica	0.001	0.998	0.001	2
tetra-black	Hybrid Tea	0.998	0.001	0.001	1
tetra-conra	Hybrid Rugosa	0.8554	0.002	0.1426	1
tetra-inabi	Hybrid Perpetual	0.9928	0.006	0.0012	1
tetra-janet	Hybrid Eglanteria	0.001	0.994	0.005	2
tetra-meivh	Unknown	0.996	0.002	0.002	1
tetra-nilbl	Hybrid Tea	0.997	0.001	0.002	1
tetra-pault	Hybrid Wichurana	0.5109	0.0064	0.4827	1*
tetra-rfed	Botanic Species	0.01	0.002	0.988	3
tetra-robus	Bourbon	0.998	0.001	0.001	1
tetra-sonia	Unknown	0.9765	0.0215	0.002	1
tetra-tiffa	Unknown	0.997	0.002	0.001	1
tetra-virgi	Unknown	0.2641	0.6959	0.04	2*
the-garland-9-C6	Hybrid Multiflora	0.995	0.003	0.002	1
the-portland-rose-16-H11	Portland	0.002	0.9968	0.0012	2
toussaint-l-ouverture-15-A12	Bourbon	0.002	0.996	0.002	2
tricolore-9-E3	Hybrid Multiflora	0.001	0.997	0.002	2
triomphe-de-l-exposition-16-F12	Hybrid Perpetual	0.4195	0.5792	0.0013	2*
unique-de-provence-15-A7	Centifolia	0.004	0.9807	0.0153	2
unique-panachee-7-B10	Centifolia	0.0486	0.949	0.0024	2
van-huyssum-16-D10	Damask	0.1463	0.8519	0.0018	2
veloute-d-orleans-7-E12	Bourbon	0.9856	0.0124	0.002	1
venusta-pendula-15-H3	Ayrshire	0.7149	0.2727	0.0124	1*
vicomtesse-d-avesne-16-E10	Noisette	0.995	0.003	0.002	1
williams-double-yellow-14-B10	Hybrid Foetida	0.0012	0.0018	0.997	3
yolande-d-aragon-7-G9	Portland	0.3296	0.669	0.0014	2*