

Research and Recovery of Ancient Ornamental Plants in Italy to Promote Floricultural Production

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Abstract

While it is already a long time that the necessity of preserving the genetic patrimony in its integrity has been understood as far as cereals and fodder crops are concerned, very little has been done for this purpose in the sector of ornamental flower crops. The reduction of genetic variability in roses and camellias represents, at present, a very serious problem, since it is impossible to reconstruct the incalculable genetic diversity of nature once it is lost. This paper concerns the identification and characterization of ancient garden roses present in a very important garden located in Cavriglia (Arezzo) and of *Camellia japonica* L. collected in several gardens of Lake Maggiore. The purpose of this paper is to safeguard and to preserve a very unique genetic patrimony which can be used in the breeding work to obtain new varieties able to respond to negative climatic conditions, to the scarcity of nutrients and to the spread of new diseases.

INTRODUCTION

In these recent years in Italy different efforts were made to improve floricultural industry that often depends on importation of products from other countries. In this contest, the importance of the use of native species has been understood, as they can be better adapted to the local environmental conditions, and used as essential genetic resources to improve marketing, obtaining crops more resistant to local climate (Fig. 1). The plant material must solve specific topics according to different purposes:

- production of wild species of considerable diffusion in different climatic situations is becoming more and more important to environment recovery. This vegetable material should show a broad genetic variability (an example of the importance of this subject is the establishment of the "Centro Regionale per la Flora Autoctona di Minoprio" near Como;
- reproduction of endemic and rare species risking disappearance and production of species with broad ecological capacity useful in the environment recovery;
- use of wild species with ornamental purposes where some characters are utilized by plant breeders to improve the species itself. In this case the specific ornamental value is taken into consideration (for example flower size and colour, etc.) in order to obtain a new product appreciated by the consumer. In some cases wild species such as alpine plants can be employed without any genetical change by collectors, by specialist amateurs, by botanical gardens and parks or in a specific part of the garden (rock garden) and for educational purposes.

Old Ornamental Varieties

While in the case of field crops it is a long time that the need to save genetic variability has been realized through the development of germplasm conservation programmes and the establishment of genetic banks (Knudson et al., 1998; Hardon, 1996; Cooper et al., 1998), only lately, in floriculture, research work has been undertaken to safeguard cultivarietal variability (Petrova, 1996).

In this contest the "Strategic project NRC (National Research Council) - Biodiversity"- Characterization and enhancement of plant, animal and microbial genetic resources, coordinated by the "Istituto del Germoplasma" (Bari) has been developed. This project has been carried out during a three years course and has involved different research centres located in different regions, in total 30 Operative Units with the purpose

to safeguard biodiversity in situ (wild species) and ex situ (cultivated species) (Perrino, 2001). The Operative Unit of Turin, represented by the Department of Agronomy, Silviculture and Land Management of the University of Turin, that has a good experience in flower crop production, carried out research concerning the phenotypic characterisation and identification of old cultivars of *Camellia japonica*, of the genus *Rhododendron* and of the genus *Rosa* to safeguard and to preserve a very unique genetic heritage which can be used in the breeding work to obtain varieties suitable also to difficult climatic and pedological conditions and disease resistant. Another purpose was to clarify the nomenclature of these varieties.

Genetic erosion is obvious and assumes an alarming significance especially in the species in which genetic improvement originated an extremely high number of cultivars. Among these, *Camellia japonica* L., the genus *Rhododendron* and the genus *Rosa* represent a bright example, as they include currently several thousands of cultivars: during the 19th century, in Italy, these ornamental plants reached a high productive importance, due to the genetic improvement that produced an increase of new cultivars of the genus *Camellia* and of the genus *Rosa* (Austin, 1988; Beals, 1989; Bosi, 1997; Corneo et al., 2000). The study and discovery of old botanical varieties is realized considering historical, botanical and cultural characteristics of each variety. These varieties are very often grown in the historical parks and gardens and represent an important germplasm reservoir. They can promote a profitable commercial activity both in garden restoration and to obtain typical, peculiar and distinctive flower products, which can be sold through a quality brand representing a very remarkable item (for example old camellia of Lucchesia).

The proper approach to study the old varieties according to our experience (Corneo et al, 2000; Remotti and Accati, 2001) is the following, (as described in Fig. 2):

- a) to investigate the historical documents which report the varieties introduced and the date of introduction;
- b) to analyse specialized old magazines, catalogues and books; to know the descriptions reported by different Authors, to compare and complete them;
- c) to characterize the varieties found in some historical sites on the base of specific protocols which allow a detailed description of the variety (flower, leaf, colour, habit, etc.). In the meantime it is absolutely necessary to take good pictures of the most interesting parts of the plant;
- d) to identify the variety through the comparison of the information gathered in the literature with the data coming from the analysis in situ (see point c).

Once the variety has been identified, it is necessary to evaluate it from the horticultural and also from the consumer's appreciation viewpoint. This requires to test the variety through agronomic trials (multiplication, evaluation of the time of growth, nutritional needs, resistance to parasites) and to realize collections of rare specimen gathering regularly data and comparing them and to assure germplasm protection and safeguard. In this way the old varieties considered suitable can be re-introduced into cultivation enlarging the number of varieties as they represent a product with new interesting characters.

Among these old varieties it is possible to identify the most significant morphological and genetic characters useful to breeding programmes. Breeding is responsible of the disappearance of old varieties and to be successful it needs a broad genetic variability, which can be assured by the conservation of old varieties: this is a strong contradiction!

This paper is referring the identification and the characterization of ancient garden roses present in a very important garden located in Cavriglia (Arezzo) and of *Camellia japonica* cultivars collected in several gardens of Lake Maggiore. The purpose of this paper is to safeguard and to preserve a very rare genetic heritage from extinction.

Genus *Rosa*

The rose-garden of Cavriglia (Arezzo –Tuscany), in spite of its relatively recent origin (it started its activity in 1963), has a remarkable scientific meaning, both for the extraordinary number of plants grown (about 7,000 species, varieties and hybrids), and for the rarity and uniqueness of many of these roses.

It was established by Prof. Gianfranco Fineschi, a well known expert of roses; the rose garden is the result of thirty years of research work on botanic species, ancient and modern roses, collected or bought all over the world (Asia Minor, central Asia, northern Asia, Mediterranean Basin, Great Britain, and North America) and, then, acclimatised in the rose-garden in Cavriglia. The collections of botanical species and of ancient roses coming from the first crosses with the same botanical species obtained in the 19th century are particular interesting (Fineschi, 2000). Most of these varieties, once frequent in gardens, have lost interest during the last century, because they were replaced by other new ones; the search of novelties determined, in fact, the success and diffusion of new plants, and the loss of old ones.

MATERIALS AND METHODS

A census of the botanical species and of the ancient roses (*Caninae*, *Synstylae*, *Cinnamomeae*, *Carolinae*, *Ecae*, etc.) and their characterisation based on the definition of a detailed characterisation method of plant features according to a specifically prepared model has been carried out. In particular, the following points have been analysed: habit of the plant (creepers, climbers, ramblers, erect, prostrate, etc.), thorniness (type, consistence, colour of the thorns, etc.), foliage (number of segments, size, colour, hairiness, type of margins, etc.), flower set (solitary, in groups), form (simple, semidouble, double), size, perfume, petals (form, number, colour, type of margin and of eventual variegation), sepals (with particular reference to lateral and floral laciniae), features of the flower peduncle (length, hairiness and colour), fruit (persistent or deciduous, form, size and colour). A picture of the flower, with some leaves, was taken for each cultivar. To evaluate such characters 3 flowers in full blooming and 3 mature leaves were considered, so to check the variability existing within a cultivar. The samples were chosen excluding the anomalous elements.

RESULTS

On the whole, more than 300 cultivars have been characterized.

The understanding of the research undertaken to create the great number of existing varieties represents an element of historical, scientific and practical importance also in view of its usefulness in parks and gardens. This could also supply valid information about the choice of species and cultivars for specific pedo-climatic features.

***Camellia japonica* L.**

Florence, Milan, and Pallanza (Verbania) were the main cultivation centres of camellia during the 18th century; in these realities a flourishing commercial activity developed, based on the sale of more than one thousand varieties. Today, the Italian production, even if it covers a considerable economic importance, is limited to the commercialization of about 200 cultivars, of which 50% of Northamerican origin, 15-20% Japanese, 4-7% Australian, and 20-28% European; only 5-9% are of Italian origin (Remotti, 2001).

In order to safeguard a botanical heritage of considerable value, to find out cultivars, surely adapted to local pedo-climatic conditions, and to re-introduce them on the Italian market, so to decrease the foreign dependence, an investigation was carried out with the aim to detect 19th century *C. japonica* cultivars present in historical gardens located along the western side of the Lake Maggiore, an area which represents a rich reservoir of germplasm due to its favourable eco-pedologic conditions.

MATERIALS AND METHODS

Based on bibliographic information derived from the check of the lists of cultivated plants in the historical gardens of the Verbania province, at the blooming time we proceeded, during the months of March and April 1999, to characterize the camellias obtained in the 19th century existing in the gardens of Villa San Remigio, Villa Taranto, Villa Ada Troubetzkoy (Ghiffa), Villa Rusconi-Clerici, Villa Anelli (Oggebbio), Botanical Garden of the Isola Madre, and the Nursery 'La Margotta' (Cannero Riviera). In these gardens only some of the cultivars have been taken into account, considering the introduction period of the cultivar in Italy, the age of the specimen (established on the grounds of the size of the specimen) and its typicity, that is a determinant factor to attain a correct determination. This characterization consisted in the editing of a morpho-botanical card, specifically prepared, in which the phenotypic features necessary for the identification were written and described and are hereafter listed. To evaluate such characters 3 flowers in full blooming and 3 mature leaves were considered, so to check the variability existing within a cultivar. The samples were chosen excluding the anomalous elements.

RESULTS

On the whole 100 cultivars of *C. japonica* have been characterized and identified. The perfection standards of extreme symmetry may represent peculiar features that would characterize a typical Italian production. Other considerations concerning cultivation, such as the evaluation of the easiness of propagation, of the time necessary for the first blooming, of the susceptibility to diseases, etc., must be made in order to establish the actual success of the re-introduction of the studied cultivars in the cultivation practice.

CONCLUSIONS

The production of a certain plant follows precise economic evaluations and is, therefore, justified only if there is a commercial interest. Therefore this causes the loss of some productions, in favour of other more "fashionable" ones. This trend is the cause of the phenomenon of "banalisation", that happens in the entire agricultural world, and is extremely dangerous, but unfortunately real. The disappearance of these old plants means losing not only a precious botanical patrimony, but also the patient and careful work made by the breeders. The safeguard becomes then a scientific, but also an economic objective.

The identification and morpho-botanical characterization of old cultivars, beside helping the safeguard and exploitation of them, allows to rediscover an interesting genetic heritage, the recovery of which could be of advantage in the restoration of historical gardens and in modern horticulture, as these cultivars are surely adapted to local ecopedological conditions.

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Figures

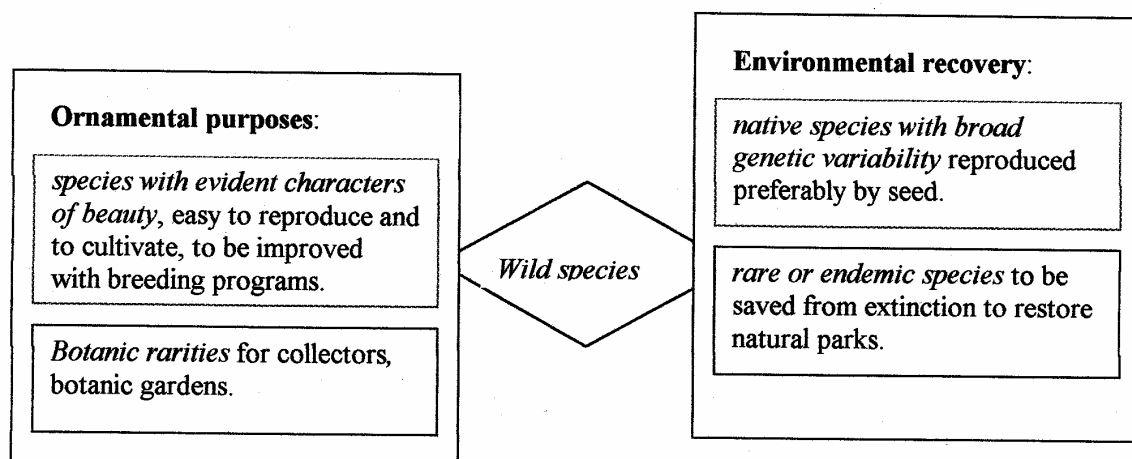


Fig. 1. The use of wild species as flower crops

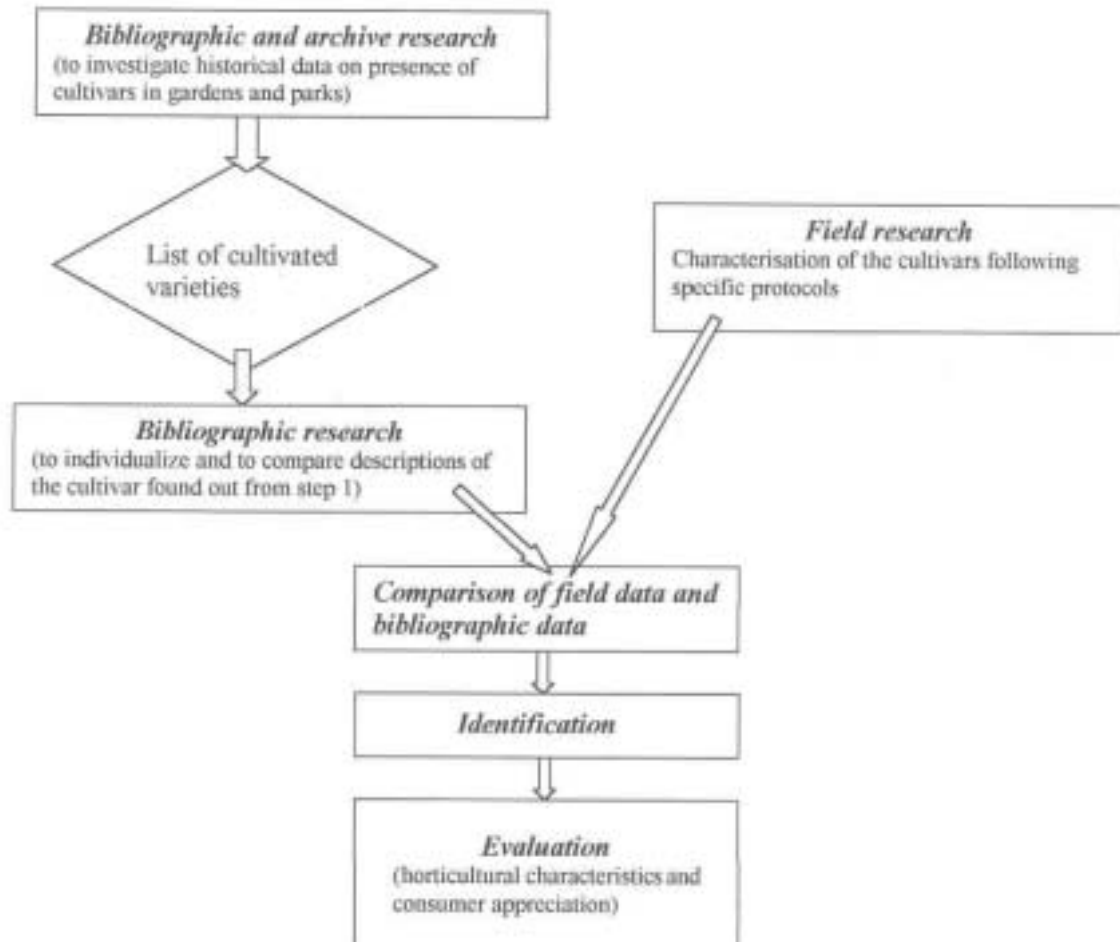


Fig. 2. Steps to study the ancient cultivars of ornamental species.