

STUDIES ON THE COLLECTION OF ROSES IN THE “DIMITRIE BRANDZA” BOTANICAL GARDEN - BUCHAREST

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Abstract

The "Dimitrie Brandza" Botanical Garden - Bucharest University was founded in 1860 and has an important role in preserving the diversity of plants species and varieties through collections. The Rosarium contains one of the most varied collections of roses. It was established on the present location during 1976-1978. Between 2008-2010 the rose collection was reorganized in a proportion of 80%. The rose collection represents an important source of germoplasma, which is used to create new varieties, but also an important base for studies regarding the responses of new varieties purchase. Researches are developing on these varieties regarding the phenological phases, biodynamic growth, phitopatology aspects and resistance to extreme conditions caused by temperature differences. Following these studies some of these varieties are to be added to nurseries and gardens in the southern part of Romania.

Keywords: collection, roses, cultivars classification, studies, purposes

INTRODUCTION

In Romania the rose research started in 1888 with W. Mühle and his ‘Mme Josephine Mühle’ rose variety and continued with his son A. Mühle who created 20 new varieties between 1923 and 1929. Rudolf Palocsay started to work in Cluj in the early 30’s and was considered a very important rose breeder. After World War II he worked with Stefan Wagner, who continued to work with roses after the death of Palocsay. Wagner created more than 20 new varieties in his career; some of them being developed in collaboration with Gabriela Roman [1].

About the collection of roses from the Botanical Garden, initially the Rosarium, was founded on the place where the greenhouses are placed today. In the beginning it was the host of 200 varieties of roses. Judging by the pictures found in the Botanical Museum (Photo 1, 2, 3), we can say that there was an important collection of grafted roses, but also hybrid tea, floribunda and polyantha etc. Everything was lost during the bombardments of World War II [2]. Once the greenhouses were built (1976-1978), the rosary was moved to the place where it stands today.

An important step in the development of the Rosarium was made during the reorganization of 2008; time when there were almost 900 roses planted, representing over 100 new varieties. This led to the reconstruction of almost 80% of the whole rose collection (photo 4). Presently, the rosary takes up almost 0.7 ha of surface, showcasing 3500 plants, 200 varieties and 7 species (*Rosa gallica* L., *Rosa wichuraiana* Crépin, *Rosa arvensis* Huds, *Rosa multiflora* Thunb., *Rosa jundzillii* Besser, *Rosa canina* L., *Rosa chinensis* (Jacq.) f. *viridiflora* C. K. Schneid. The results presented in this essay are a compendium of several works from PhD theses; regarding to the study of 10 varieties from a phenological phases [3,4], growth biodynamics, disease resistance aspects and also resilience to high temperatures [1,5], point of view.



Photo 1. Old greenhouses



Photo 2. Aspects from the old collection



Photo 3. Aspects from the old collection



Photo 4. Present aspects

MATERIAL AND METHOD

The biological material for the studies is represented by 10 rose varieties, which were planted during 2008 and 2009 ('Abraham Darby', 'Acapella', 'Angela', 'Caprice de Meilland', 'Christoph Columbus', 'Forever Young', 'Heritage', 'Ingrid Bergman', 'Rhapsody in Blue', 'Red Berlin'). These varieties received the same climate conditions. Crop technology was done step-by-step in normal conditions, with spring cuts and also, cuts during the vegetation state for stimulating a new wave of bloom [1]. 2011 marked the beginning of the biodynamic growth, phenological phases studies and a study on the resistance to diseases and extreme temperature resilience.

Biodynamic growth was determined by measuring the longest shoot grown between May and November, once every 4 weeks [3, 4]. Phenological phases were visually determined during the most important steps (budding, leafing, blooming) [3, 4]

The disease resistance details were considered, by observing the plants resilience towards the most important pathogen agents: *Sphaerotheca pannosa*, *Phragmidium disciflorum*, *Diplocarpon rosae* [1,5]. The visual aspects were observed and verified in the mycology lab from the Faculty of Biology. Details regarding the resilience towards extreme temperatures were determined by observing wood loss after winter frosts; when spring cuts were performed in spring 2012 [1].

RESULTS AND DISCUSSIONS

The results of the observations were:

Regarding the budding and leaf phenological phases there were similarities recorded among varieties [3, 4]. Regarding early flowering 'Forever Young' (floribunda) was recorded as the earliest variety to bloom (May 19) the latest being 'Rhapsody in Blue' (June 7) (Table 1).

Table 1. Phenological phases for researched varieties

Variety	Budding	Leafing	Blooming
Abraham Darby	March 15	March 29	May 24
Acapella	March 15	March 29	May 30
Angela	March 15	March 29	May 23
Caprice de Meilland	March 14	March 29	May 24
Christoph Columbus	March 16	March 31	May 30
Forever Young	March 15	March 29	May 19
Heritage	March 15	March 29	May 25
Ingrid Bergman	March 15	March 29	May 26
Red Berlin	March 15	March 31	May 26
Rhapsody in Blue	March 15	March 31	June 7

Growth rate observed during May and November of 2011 is highlighted in Table 2, as well as in the graphs (Fig.1, 2, 3, 4).

Growth speed was influenced by suppression of past flowers along with some brushwood [1]. Overall, the growth rate was clearly higher, during spring season. Between the varieties of each group, the growth rate recorded different values; for example: in the hybrid tea group, the 'Acapella' variety had a longer period of active growth until the month of August; a strong fluctuation of growth was recorded on the Caprice de 'Meilland' variety (Fig. 1).

Table 2. Length of shoots monthly (cm)

Variety	Group	Mai	June	July	Aug	Sept	Oct	Nov
Angela	park rose	52	112	100	160	210	245	240
Abraham Darby	English rose	50	65	110	56	30	40	120
Heritage	English rose	24	65	110	161	161	52	150
Forever Young	floribunda	42	50	45	16	10	23	42
Rhapsody In Blue	floribunda	60	107	130	136	133	88	140
Acapella	hybrid tea	54	63	77	110	108	30	180
Caprice de Meilland	hybrid tea	40	60	90	34	93	50	104
Christoph Columbus	hybrid tea	63	80	101	52	45	26	165
Ingrid Bergman	hybrid tea	33	64	72	35	26	16	113
Red Berlin	hybrid tea	40	63	65	35	28	19	84

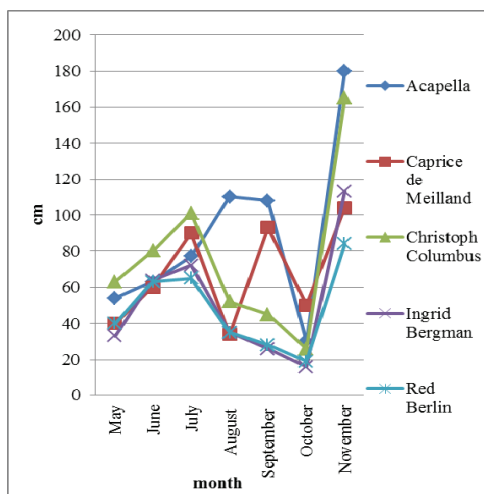


Fig. 1. Length of shoots during 2011 in hybrid tea rose group

In the English rose group, the two varieties studied, presented a progressive decrease in growth that began in July (Fig. 2)

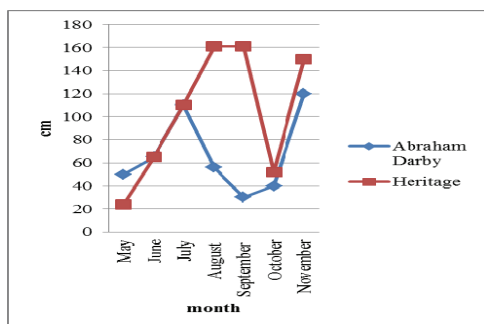


Fig. 2. Length of shoots during 2011 in English rose group

On the varieties in both groups, there was a decrease in growth when high temperatures started [1]; during the month of September, a

new wave of growth was observed. Hybrid tea varieties had similarities with English rose varieties in the first part of vegetation when the growth rate is sustained and a decrease, during high temperature season [1]; in the floribunda group, some differences in growth rate were recorded (Fig. 3).

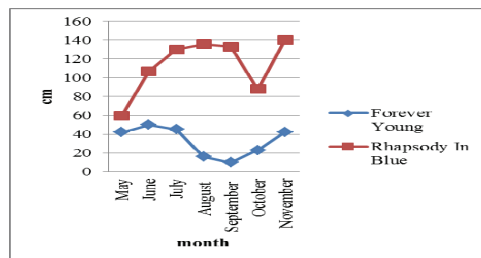


Fig. 3. Length of shoots during 2011 in floribunda group

The most representative variety in the park roses group - 'Angela' presented an almost constant growth rate and has not been strongly influenced by the cuts during the vegetation period (Fig. 4)

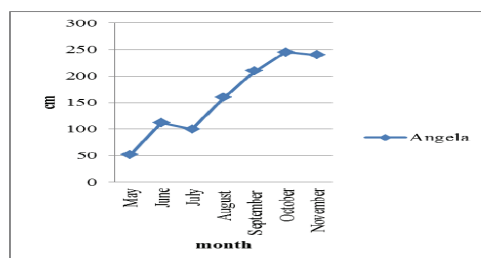


Fig. 4. Length of shoots during 2011 in rose park group

The graphs above (Fig.1, 2, 3, 4) show that the cuts made in the second decade of June have not slowed the growth rate of most varieties, up until July, when high temperatures occurred [1]. The energy for growth given by the maximum height growth of plants at the end of vegetation (table 3) showed a difference between groups of varieties, in terms of maximum length of shoots.

Disease resilience of the studied varieties is shown in Table 3 [1, 5]. 'Heritage' has shown high resistance; good/very good resistance was shown by 'Angela' and 'Christoph Columbus', as the rest of varieties have shown different levels of tolerance towards the different pathogen agents.

Tabel 3. Diseases resistance

Variety	<i>Sphaerotheca pannosa</i>	<i>Diplocarpon rosae</i>	<i>Phragmidium disciflorum</i>
Abraham Darby	++	++	+++
Acapella	+	++	+++
Angela	++	+	+++
Caprice de Meilland	+	+	++
Christoph Columbus	++	+++	+++
Forever Young	+	+	++
Heritage	+++	+++	+++
Ingrid Bergman	++	++	++
Red Berlin	+	+	++
Rhapsody In Blue	+++	++	++

+ weak resistance

++ good resistance

+++ very good resistance

Resistance to extreme temperatures was recorded in spring 2012 when losses on most varieties were significant (about 75% of growth) [1].

CONCLUSIONS

1. Overall, the results show different growth aspects according to rose variety group;
2. Climate conditions present during the spring of 2011 did not influence the different phenological phases of leaf and budding on the 10 varieties observed;
3. The differences observed during early blooming, indicate that this is something specific to each variety;
4. The growth rate was sustained during spring season, until mid-July without being held back by cuts after the first wave of blooming, with the exception of the 'Angela' variety (Group rose park) which had an almost continuous growth;

5. The variety with the most noticeable growth rate belongs to the rose park group; 'Angela' reaching even 245 cm. Also, some noticeable growth rates were observed in the hybrid tea group, especially on the 'Acapella' and 'Christoph Columbus' varieties;

6. The results of the first year of study on the 10 varieties of roses are shown, with the purpose of selecting and promoting some of them for the parks and gardens areas in Bucharest. More research will be conducted. These rose varieties will be the object of future studies that will consider different measurements regarding their growth;

ACKNOWLEDGEMENTS

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