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Cluj-Napoca

THE "ALEXANDRU BORZA" BOTANICAL GARDEN TULIP COLLECTION (2014–2015)

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Abstract: This paper presents a brief analysis of the tulip collection in the "Al. Borza" Botanical Garden, which in 2015 achieved a record number of 142 cultivars. This diversity is available and should be exploited scientifically in various approaches used in studies of crop technology, phenology, stability of characters, etc.

Key words: tulip, collection, Botanical Garden Cluj-Napoca, cultivars.

Introduction

The Tulip is considered the "Queen of Gardens" in spring. The history of tulip cultivation is shorter than that of the lilies, peonies or roses, but is still rich and fascinating. These splendid flowers have a 'glorious' past, formerly arousing deep passions, even causing economic crises and defining the history of an era [7, 11].

The genus *Tulipa* comprises about 150 species. Nowadays there are known some 5600 varieties and hybrids with high decorative value regarding the colour, size and shape of tepals [2,9].

Tulip cultivation is traditional in the "Al. Borza" Botanical Garden, Cluj-Napoca, ever since 1920 when the botanical garden was created. In the Ornamental Sector tulips had been planted in flowerbeds of sunny aspect all along the alleys where these flowers were able to exhibit their beauty and elegance. Unfortunately, in the publications of the Botanical Garden, only in 2002 was the tulip collection described, with 80 varieties and hybrids, most of them belonging to the species *Tulipa gesneriana*, which under our climatic conditions presents the best performance, along with some other botanical species [5,12]. The collection comprised this number of varieties until 2012 when it decreased to 60, most of the bulbs being strongly infested with *Fusarium oxysporum* f. sp. *Tulipae*. This fungus has compromised the collection to almost 80% making necessary the replacement of bulbs. In 2013 the Dutch ES ELEKTRO society provided by sponsorship 5000 bulbs of 100 varieties, enriching the existing collection up to 123 cultivars. In the following spring there was an explosion of flower shape and colour, attracting a large influx of visitors (e.g. on 28 May almost 4000 persons visited the Botanical Garden). The same sponsor returned in the autumn of 2014 with another 2500 bulbs, so that in 2015 the tulip collection had reached 142 cultivars (Fig.1).

Such an ample collection can offer comprehensive experimental material for breeders regarding the study of performance, phenology, disease and pest resistance, and stability of characters in the climatic conditions of Cluj-Napoca, this being the aim of the present paper.

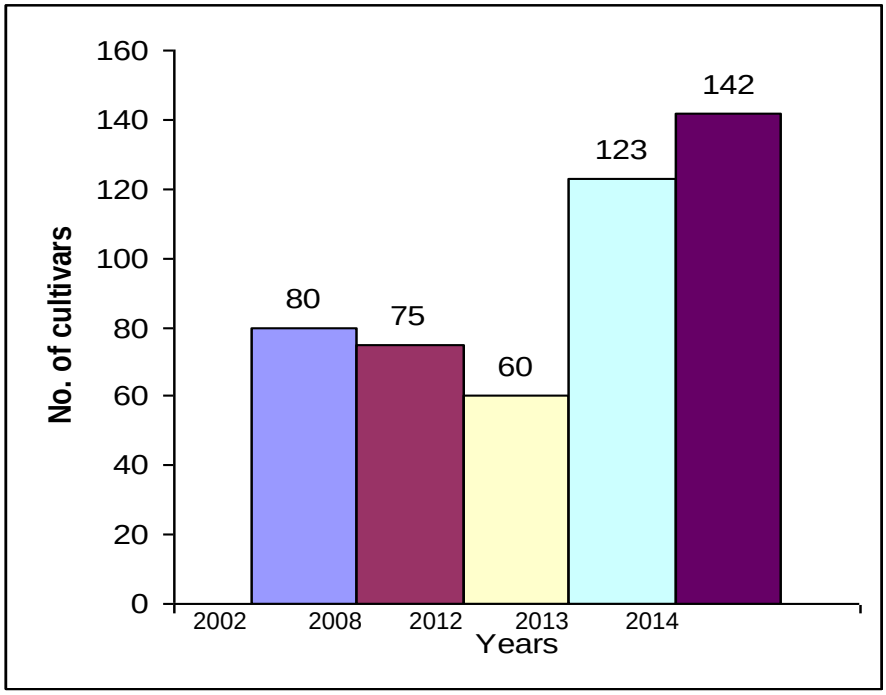


Fig.1: Expansion of numbers of tulip cultivars in "Al. Borza" Botanical Garden Cluj-Napoca

Results and Discussion

Brief description of the collection:

- The 142 taxa of our tulip collection, according to their horticultural classification [1, 4], belong to 16 divisions (groups) with regard to flowering period and aspect of the flowers (Table 1). Most of the cultivars belong to the group of *Triumph tulips* (29), *Fringed tulips* (14), *Double late tulips* (13), *Parrot tulips* and *Double early tulips* (12 cultivars).
- The tulip collection exhibits some extremely spectacular cultivars with various flower shapes and colours: fringed type (e.g. '*Fancy Frills'*, *'Curly Sue', 'Davenport'*, etc.); parrot type (e.g. *'Black Parrot'*, *'Topparrot'*, *'Estella Rijnveld'*, etc.); with simple flowers (*'Atlantis'*, *'La Courtine'*, *'Christmas Marvel'*, etc.) or abundant peony type (e.g. *'Blue Diamond'*, *'Queen of Marvel'*, *'Willemsoord'*, etc.); lily type (*'China Pink'*, *'West Point'*, *'Elegant Lady'*, etc.); with pure white tepals (*'Hakuun'),* and countless shades of pink (*'Angelique'*, *'Pink Impression'*), yellow (*'Yellow Flight'*), orange (*'Orange Princess*'), red (*'Apeldoorn'*, *'Couleur Cardinal'*), to the so-called "black tulip", which is in fact dark violet (*'Paul Scherer'*, *'Queen of Night'*); with bicoloured flowers (*'Banja Luka'*, *'Esperanto'*), and even coloured leaves (*'Sweet Lady'*, *'Red Riding Hood'*, etc.); and, finally, with multiple flowers on the scape (*'Candy Club'*, *'Antoinette'*, etc.).
- In the spring of 2015 the earliest variety was *'The First'* (on 23 March), followed by: *'Heart's Delight'* and *'Quebec'* (26 March); *'Showwinner'* and *'Jetfire'* (27 March);

'Mary Ann' (30 March), etc. The latest flowering cultivars were: *'Antoinette'*, *'Curly Sue'*, *'Davenport'* (2 May), *'Gavota'*, *'Gipsy Love'* (3 May), *'Atlantis'* and *'Carrousel'* (4 May), with a blooming period up to the beginning of June (Table 1).

- The decorative value of tulips is enhanced by the planting design composition with other ornamentals such as *Muscari*, *Hyacinthus*, *Narcissus*, *Viola*, *Myosotis* and *Bellis* [8], (Fig. 2).

Table 1: The Tulip collection (2014–2015) of the "*Al.Borza*" Botanical Garden Cluj-Napoca, Romania

Groups (no. of cultivars in the collection)	Cultivar	Flowering time (month)	Height of plant (cm)	Color
I. Single early tulips (No.= 9)	*Baby Blue*	IV	30	purple-blue
	Christmas Marvel	IV	35	deep pink
	Couleur Cardinal	IV	45	deep red
	Hermitage	IV	35	orange
	White Marvel	IV	35	white
	Yokohama	IV	45	yellow
	Apricot Magic	IV	35	light orange
	Merry Christmas	IV	35	red
	Prinses Irene	IV	35	bright orange-purple
II. Double early tulips (No. = 12)	*Abba*	IV	30	deep red
	La Belle Epoque	IV	45	pink salmon
	Mondial	IV	30	white
	Monsella	IV	30	yellow with red
	Monte Carlo	IV	30	yellow
	Orange Princess	IV	30	orange
	Queen of Marvel	IV	35	pink
	David Teniers	IV	25	deep red
	Eternal Flame	IV	30	deep red
	Peach Blossom	IV	25	light pink
	Willem Van Orange	IV	25	orange
	Willemsoord	IV	25	deep red
III. Triumph tulips (No. = 29)	*Annie Schilder*	IV	40	orange
	Apricot Foxx	IV	45	light orange-pink
	Arie Hoek	IV	55	red
	Boston	IV	55	yellow with violet
	Brown Sugar	IV/V	30	deep orange
	Carnaval de Rio	IV/V	50	white with red
	Escape	IV	50	red
	Fontainebleau	IV	50	purple with white
	Guus Papendrecht	IV	45	burgundy with white
	Havran	IV	50	deep purple
	Negrita	IV/V	45	deep purple
	Paul Scherer	IV	45	dark purple
	Pretty Princess	IV	45	pink with purple
	Recreado	IV	50	deep purple
	Rems Favourite	IV	50	purple with white
	Suncatcher	IV	45	yellow with red

	Yellow Flight	IV/V	35	yellow
	Jan Reus	IV	50	deep purple
	Garden Party	IV	40	pink with white
	Kees Nelis	IV	45	red with yellow
	Play Girl	IV	45	white with pink
	White Dream	IV	45	white
	Calgary Flames	IV	20	white with light yellow
	Don Quichotte	IV	50	deep pink
	Leen van der Mark	IV	45	pink with white
	Tender Whisper	IV	45	fuchsia with white
	Veronique Sanson	IV	45	orange with red
	Purple Flag	IV	50	deep purple
	Gavota	IV	50	burgundy with yellow
IV. Darwin hybrid tulips (No. = 10)	*Apeldoorn's Elite*	IV	55	orange with red
	Beauty of Apeldoorn	IV	55	golden orange
	Daydream	IV	55	apricot orange
	Hatsuzakura	IV	55	pink with white
	Banja Luka	IV	50	dark yellow streaked with red
	Ad Rem	IV	60	scarlet petals with golden band
	American Dream	IV	55	golden yellow with reddish-orange
	Hakuun	IV	55	white
	Salmon Impression	IV	55	light pink salmon
	Sweet Impression	IV	55	light pink salmon
V. Single late tulips (No. = 5)	*Atlantis*	V	55	purple with white
	Ile De France	V	50	red
	Queen Of Night	V	60	dark velvet maroon
	Sorbet	V	60	red with white
	Shirley	V	50	white with purple
VI. Lily-flowered tulips (No. = 5)	*China Pink*	V	45	pink
	Claudia	V	55	purple with white
	Elegant Lady	V	45	yellow with pink
	Sanne	V	55	pink with cream
	West Point	V	50	yellow
VII. Fringed tulips (No. = 14)	*Burgundy Lace*	V	60	magenta to burgundy
	Canasta	V	45	red with white
	Curly Sue	V	45	deep purple
	Davenport	V	45	red with yellow
	Fancy Frills	V	45	pink
	Carrousel	V	60	cream with red
	Daytona	V	50	white
	Lambada	V	50	golden-orange
	Mascotte	V	45	purple
	Oviedo	V	60	pink with white
	Queensland	V	45	pink with white
	Fringed Family	V	45	pink
	Valery Gergiev	V	45	red
	Sensual Touch	V	50	light orange
VIII. Viridiflora tulips	*China Town*	V	45	light pink
	Esperanto	V	30	red

(No. = 5)	*Golden Artist*	V	30	golden orange
	Nightrider	V	50	deep purple
	Spring Green	V	50	white-cream
IX. Rembrandt tulips	Mix	IV/V	50	bicolored red with yellow
X. Parrot tulips (No. = 12)	*Apricot Parrot*	V	50	apricot pink
	Black Parrot	V	50	deep purple
	Estella Rijnveld	V	50	red with white
	Topparrot	V	40	red
	Orange Favourite	V	50	orange with red
	Parrot King	V	50	golden apricot
	Professor Röntgen	V	50	golden apricot
	Super Parrot	V	40	white
	Texas Flame	V	45	yellow with red
	Green Wave	V	50	light pink
	Libretto Parrot	IV/V	45	pink and cream
	Blue Parrot	V	55	violet
XI. Double late tulips (No. = 13)	*Abigail*	V	50	purple
	Akebono	V	55	yellow
	Angélique	V	45	pink
	Black Hero	V	60	deep purple
	Blue Diamond	V	40	violet
	Carnaval De Nice	V	40	white with red
	Drumline	V	45	white with red
	Queensday	V	45	orange
	Verona	V	40	golden yellow
	Sweet Desire	V	45	light pink with white
	Maureen Double	V	50	white
	Renown Unique	V	50	red with white
	Uncle Tom	V	45	deep purple
XII. Kaufmanniana tulips (No. = 7)	*Heart's Delight*	IV	20	red with cream
	Ice Stick	III	35	white with pink
	Love Song	III	25	orange
	Scarlet Baby	III	20	red
	Showwinner	III	25	red
	Stresa	III/V	25	yellow with red
	The First	III	20	cream with red
XIII. Fosteriana tulips (No. = 6)	*Orange Emperor*	IV	40	orange with red
	Princeps	IV	25	red
	Yellow Purissima	IV	40	golden yellow
	Pirand	IV	40	red with white
	Purissima	IV	40	white
	Solva	IV	40	red
XIV. Greigii tulips (No. = 8)	*Cape Cod*	IV	30	red with orange
	Quebec	IV	35	scarlet with yellow
	Royal Anthos	IV	30	red
	Sweet Lady	IV	30	apricot
	Red Riding Hood	IV	30	red
	Mary Ann	IV	35	white with pink
	Toronto	IV	30	red
	Flowerdale	IV	30	yellow-orange

XV. Botanical species tulips (No. = 2)	*Tulipa linifolia*	IV	10	red
	Tulipa tarda	IV	10	yellow
XVI. Multi-flowering tulips (No. = 5)	*Candy Club*	V	50	ivory-white with pale pink
	Praestans Unicum	IV	35	red
	Jetfire	IV/V	45	red
	Antoinette	V	40	pale yellow and salmon pink
	Gipsy Love	V	50	dark red





Fig. 2: Tulips in "Alexandru Borza" Botanical Garden (photo: A. Pui)

Unfortunately, certain organizational and pedo-climatic features of the Botanical Garden impose a number of issues related to their culture technology. Thus:

- Crop rotation cannot be achieved, therefore a regular intervention is necessary to improve the soil structure, texture and chemistry.
- A rather high vulnerability to diseases such as grey mould (*Botrytis tulipae*) and *Fusarium oxysporum* f. sp. *tulipae*, and pests such as aphids (*Aphidae*) and bulb mites or root spiders (*Rhizoglyphus echinops*) has been observed [6];
- Planting of bulbs is often delayed due to the existing cultures (the *Dahlia*, *Canna* and annual ornamentals collections) [9];
- Harvesting of bulbs is two or three weeks earlier than the best period since it is necessary to release the ground for planting the summer-autumn collections. Early harvesting declines quality in most of the new bulbs [10].

Conclusions

A wide range of tulip cultivars arouses the interest of visitors, which is of financial benefit the Botanical Garden. At the same time, a large and well-maintained collection offers an important research base for researchers, PhD. and college students.

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COLECŢIA DE LALELE A GRĂDINII BOTANICE "ALEXANDRU BORZA" DIN CLUJ-NAPOCA (2014-2015)

(Rezumat)

Laleaua, considerată "regina" grădinilor de primăvară, este întâlnită cel mai frecvent, în climatul nostru, prin specia Tulipa gesneriana. În prezent, în lume se cultivă cca.5.600 de soiuri şi hibrizi care diferă, cel mai adesea, prin forma şi culoarea tepalelor.

În Grădina Botanică "Al.Borza", se cultivă lalele încă de la înfiinţarea ei, în 1920, sortimentul de soiuri şi hibrizi îmbogăţindu-se de-a lungul timpului. De la câteva soiuri, câte au fost la început, s-a ajuns în 2015, la o colecţie impresionantă de 142 de cultivarii. Conform clasificării horticole, aceşti taxoni aparţin la 16 divizii (grupe), în funcţie de epoca de înflorire şi de aspectul florilor. Dintre aceştia, cel mai bine au fost reprezentaţi cei din grupurile: Triumph tulips (29), Fringed tulips (14), Double late tulips (13), Parrot tulips şi Double early tulips (câte 12).

Prin această colecţie impresionantă, care prin forma şi culoarea florilor, oferă un adevărat "spectacol" de primăvară pe parcursul a două luni, sunt atraşi foarte mulţi vizitatori în Grădina Botanică. De asemenea, colecţia oferă material de studiu ştiinţific pentru cercetători, doctoranzi şi studenţi pentru a putea urmări comportamentul diferitelor cultivarii de lalele în condiţiile pedo-climatice din Cluj-Napoca, fenologia, rezistenţa la boli şi dăunători, precum şi stabilitatea lor în timp.

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