RESEARCH ON FINDINGS ABOUT CULTIVATION AND USE OF ANNUAL AND BIENNIAL FLOWERING PLANT SPECIES IN THE REGION OF ŠIBENIK AND KNIN – THE REPUBLIC OF CROATIA

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Abstract

Most plant species that are cultivated in climatic conditions prevailing in the Republic of Croatia as annual or biennial flowering plants originate from warm and temperate climate zones of the planet. The plant groups in question are primarily used in privately-owned gardens and on various landscapes. They can be planted in raised flower beds, as well as used for landscape edging, rock gardens, decorative pots and they are also used as cut flowers. They are cost effective and provide the premises with a decorative value added. The objective of the survey research was to verify the findings about cultivation and use of annual and biennial flowering plants that are frequently used in gardens and landscaping in Šibenik and Knin. The survey research was conducted in May 2016 on a sample comprising of 30 respondents (for annual species) and 29 different respondents (for biennial species) from the region of the cities Šibenik and Knin and their outskirts. The respondents assessed the decorative features of six selected species per individual flower group and the method of their maintenance with an average grade (4). The participants in the survey showed a higher level of knowledge on annual flower species (67.7%-100%) compared with the knowledge on biennial flower species (57.9%-75.9%). The persons questioned correctly assessed the use of various species according to their function in the premises. Most respondents used decorative pumpkins (Cucurbita pepo) amongst annual flower plants for decoration of premises, whilst amongst biennial plants they primarily opted for daisies (Bellis perennis). The data provided can be used for the promotion of cultivation and use of flowering plants in practice.

Keywords: Gardens, landscape, knowledge.

Introduction

Annual and biennial flowering plants are an integral feature of all parks, gardens, yards, balconies and terraces. Their biological lifecycle is restricted to one or two years. Their origins vary, yet they normally originate from areas with moderate or warmer climate (Vinceljak-Toplak, 1989).

The previously mentioned flower groups have been used in landscape architecture since ancient times, yet the preserved records about floral gardens, their arrangement and types within different plantings are scarce. It was only at the end of the 19th century, upon appearance of the civil society, that public parks were established (R. Visiani Park in Šibenik) (Piplović, 2003). During the first half of the 20th century, Mate Zorić, a gardener from Šibenik, cultivated flowers within his nursery to meet the requirements both of public spaces and the general public. Subsequently, primacy was taken over by the company named Zelenilo (Dorbić and Temim, 2016). A more committed landscape architecture with greenery and flowers in Knin commenced after the Second World War (Dorbić and Temim, 2015). In the area of Knin and Šibenik the following annual flowering plants are currently the most popular: begonias (*Begonia semperflorens*), petunias (*Petunia hybrida*), scarlet sage (*Salvia splendens*), marigolds (*Tagetes*), pumpkins (*Cucurbita pepo*) and sunflower (Helianthus annuus). Amongst the biennials it is important to highlight as follows: daisies (Bellis perennis), pinks (Dianthus

sp.), pansies (Wiola x vittrockiana), bellflowers (fam. Campanulaceae), hollyhocks (*Alcea rosea*) and wallflowers (*Cheiranthus Cheiri*), amongst others. The popularity of seasonal flowers is in the fact that they are of modest needs, they prefer sunny habitats and plenty of water and they bloom lusciously throughout the summer months. They are widely used, since they can be planted in flower beds of different design, rock gardens, decorative flower pots, as well as used as cut flowers. In order to create an appealing floral composition, one needs to have an insight into the flowering time and duration, as well as the colour, the height, habitus, as well as biological and ecological traits of the specific species. Floral features are grouped in carefully selected venues in order to emphasise specific compositional traits. Flowering time and duration have an immense practical importance (Vujković and Došenović, 2014). Irrespective of the fact that currently, due to a lack of available time, reduced costs and ecological benefits, the use of autochthonous plants is given precedence (Židovec and Karlović, 2005.), annual and biennial flowering plants are still fashionable due to a wide variety of their flowers.

The objective of this paper is to analyse the perception of the general knowledge about annual and biennial flowering plants in the area of Knin and Šibenik through application of the survey method.

Material and methods

In the drafting of this paper, various publications were used as secondary sources of information. Surveys conducted in the town of Knin and its surrounding area, as well as the area of the city of Šibenik, were used as primary sources of information. The goal of the survey was to ascertain general knowledge regarding annual and biannual flowering plant species.

The survey regarding annual flowering species was conducted during May 2016 among a sample of 30 subjects in the area of Knin and its surroundings, as well as Šibenik (17 female and 13 male subjects). Distribution of sample by age group was as follows: younger than 20 years of age – 5 subjects, between 20 and 30 – 11 subjects, 30-40 – 1 subject, 40-50 – 2 subjects, 50-65 – 3 subjects, and over 65 years of age – 8 subjects. Distribution of sample by level of education was: elementary school 13,3%, secondary professional qualification 63,3%, higher expertise 13,3% and higher professional qualification 10,0%.

For the purposes of this paper, a five-degree scale (measuring attitudes on decoration and maintenance of species) with values 1 to 5 was used. Data was processed using the criteria of central tendency, that is, based on the analysis of the arithmetic mean and standard deviation. Statistical analysis of data was done using software SPSS 16 for Windows interface.

Results and discussion

The subjects evaluate and perceive floral characteristics and means of maintenance of the following species (Table 1.): begonia (*Begonia semperflorens*), decorative summer squash (*Cucurbita pepo*) with value of circa 4,0 and perceive petunia (*Petunia x Hybrida*), Mexican marigold (*Tagetes erecta*) and scarlet sage (*Salvia splendens*) as having somewhat higher value.

According to the survey and the photographs, the subjects recognize species in the following degrees (Table 2.): sufficient – begonia, good – petunia, scarlet sage, excellent – sunflower and Mexican marigold. As seen in chart 2, the subjects have used decorative squash, sunflowers and marigolds to a higher percentage, and have used begonia, petunia and scarlet sage in a lesser degree.

Table 1. Results of evaluation and maintenance of certain flowering species

Ordinal No.	Questions	Arithmetic Mean	Standard Deviation
1.	Evaluate the decorative characteristics of the begonia (*Begonia semperflorens*). (1 – non-decorative, 5 – very decorative)	3,87	,900
2.	Evaluate the maintenance of begonias (1 – very difficult, 5 – easy)	4,03	,964
3.	Evaluate the decorative characteristics of the summer squash (*Cucurbita pepo*). (1 – non-decorative, 5 – very decorative)	3,97	1,129
4.	Evaluate the maintenance of the summer squash (1–- very difficult, 5 – easy)	3,93	1,015
5.	Evaluate the decorative characteristics of the petunia (*Petunia x hybrida*). (1 – non-decorative, 5 – very decorative)	4,47	,900
6.	Evaluate the maintenance of the petunia (1 – very difficult, 5 – easy)	4,03	,850
7.	Evaluate the decorative characteristics of the sunflower (*Helianthus annuus*). (1 – non-decorative, 5 – very decorative)	3,83	1,147
8.	Evaluate the maintenance of the sunflower (1 – very difficult, 5 – easy)	3,80	1,064
9.	Evaluate the decorative characteristics of the Mexican marigold (*Tagetes erecta*). (1 – non-decorative, 5 – very decorative)	4,30	1,022
10.	Evaluate the maintenance of the Mexican marigold (1 – very difficult, 5 – easy)	4,27	,691
11.	Evaluate the decorative characteristics of the scarlet sage (*Salvia splendens*). (1 – non-decorative, 5 – very decorative)	4,17	,834
12.	Evaluate the maintenance of the scarlet sage (1 - very difficult, 5 – easy)	3,39	1,015

Table 2. Results of recognition and usage of certain flowering species

Ordinal No.	Questions	Yes %	N0 %
1.	Do you recognize the begonia (*Begonia semperflorens*)	66,7	33,3
2.	Have you used begonias?	53,3	46,7
3.	Do you recognize the summer squash (*Cucurbita pepo*)	100	/
4.	Have you used summer squash?	83,3	16,7
5.	Do you recognize the petunia (*Petunia x hybrida*)	73,3	26,7
6.	Have you used petunias?	50,0	50,0
7.	Do you recognize the sunflower (*Helianthus annuus*)	100	
8.	Have you used sunflowers?	56,7	43,3
9.	Do you recognize the Mexican marigold (*Tagetes erecta*)	90,0	10,0
10.	Have you used Mexican marigold?	70,0	30,0
11.	Do you recognize the scarlet sage (*Salvia splendens*)	70,0	30,0
12.	Have you used scarlet sage?	30,0	70,0

As seen in Table 3., the subjects have used the following for balconies and terraces: *Begonia semperflorens* (60%), *Petunia x hybrida* (43%), *Tagetes erecta* (23,3%) and *Salvia splendens* (63,3%). In gardens, the subjects mostly used: *Cucurbita pepo, Helianthus annus* (over 90%), *Tagetes erecta* and *Salvia splendens* (20%). In parks, the subjects perceive: *Petunia x Hybrida* (43,3%) and *Tagetes erecta* (47,7%).

It is evident from the Table 4. that the best values were assigned to the decorative characteristics of: daisy (*Bellis perennis* L.) graded 4,34 and Sweet William (*Dianthus barbatus*) graded 4,34. The

subjects perceive Sweet William (4,21) as easiest and common wallflower (3,66) as hardest to maintain.

Table 3. Results for manners of usage of certain flowering species

Ordinal No.	Questions	A %	B %	C%
1.	Evaluate way of begonias (*Begonia semperflorens*) application in landscape. A) gardens B) parks C) balcony / terraces	16,7	23,3	60,0
2.	Evaluate way of summer squash (*Cucurbita pepo*) application in landscape. A) gardens B) parks C) balcony / terraces	90,0	/	10,0
3.	Evaluate way of petunias (*Petunia x hybrida*) application in landscape. A) gardens B) parks C) balcony / terraces	13,3	43,3	43,3
4.	Evaluate way of sunflowers (*Helianthus annuus*) application in landscape. A) gardens B) parks C) balcony / terraces	93,3	3,3	3,3
5.	Evaluate way of Mexican marigold (*Tagetes erecta*) application in landscape. A) gardens B) parks C) balcony / terraces	30,0	46,7	23,3
6.	Evaluate way of scarlet sage (*Salvia splendens*) application in landscape. A) gardens B) parks C) balcony / terraces	20,0	16,7	63,3

Results of the survey research for the biennial flowers species

Surveys were conducted in the town of Knin and its surrounding area, as well as the area of the city of Šibenik. The goal of the survey was to ascertain general knowledge regarding biannual flowering plant species.

According to the survey and the photographs, the subjects recognize species in the following degrees (Table 5.): The highest number of subjects (79,3%) recognizes common hollyhock (79.3%), daisy (75,9%), Sweet William (75,9%) and pansy (75,9%). Only 51% of the subjects recognizes Canterbury bells. As seen in the chart, more subjects used common hollyhock (48,3%), Sweet William (44,8%) and pansy (34,5%) than daisy (24,1%), common wallflower (13,8%) and Canterbury bells (10,3%).

As seen in table 6., the subjects value the following species highest for balconies and terraces: *Dianthus barbatus* (69,0%); for gardens: *Campanula medium* (58,6%), *Altea rosea* (48,3%) and *Cheiranthus cheiri* (37,9%), *Wiola x wittrockiana* (31,0%), *Dianthus barbatus* (17,2%), *Bellis perennis* L. (17,2%); for parks: *Bellis perennis* L. (75,9%), *Wiola x wittrockiana* (69,0%) and *Cheiranthus cheiri* (55,2%).

Table 4. Results of evaluation and maintenance of certain flowering species

Ordinal No.	Questions	Arithmetic Mean	Standard deviation
1.	Evaluate the decorative characteristics of the daisy (*Bellis perennis* L.) (1 – non-decorative, 5 – very decorative)	4,34	,857
2.	Evaluate the maintenance of the daisy (1 – very difficult, 5 – easy)	3,97	,906
3.	Evaluate the decorative characteristics of the Sweet William (*Dianthus barbatus*). (1 – non-decorative, 5 – very decorative)	4,34	1,078
4.	Evaluate the maintenance of the Sweet William (1 – very difficult, 5 – easy)	4,21	,978
5.	Evaluate the decorative characteristics of the pansy (*Wiola x wittrockiana*). (1 – non-decorative, 5 – very decorative)	4,07	,884
6.	Evaluate the maintenance of the pansy (1 – very difficult, 5 – easy)	4,00	,802
7.	Evaluate the decorative characteristics of the Canterbury bells (*Campanula medium*). (1 – non-decorative, 5 – very decorative)	3,83	1,104
8.	Evaluate the maintenance of the Canterbury bells (1 – very difficult, 5 – easy)	3,59	1,053
9.	Evaluate the decorative characteristics of the Wall flower (*Cheiranthus cheiri*). (1 – non-decorative, 5 – very decorative)	4,14	,953
10.	Evaluate the maintenance of the Wall flower (1 – very difficult, 5 – easy)	3,66	,936
11.	Evaluate the decorative characteristics of the Common hollyhock sage (*Alcea rosea*). (1 – non-decorative, 5 – very decorative)	4,24	,689
12.	Evaluate the maintenance of the Common hollyhock (1 – very difficult, 5 – easy)	4,03	,944

Table 5. Recognition and usage of decorative species

Ordinal No.	Questions	Yes %	N0 %
1.	Do you recognize the daisy (*Bellis perennis*)?	75,9	24,1
2.	Have you used daisy?	24,1	75,9
3.	Do you recognize the Sweet William (*Dianthus barbatus*)	75,9	24,1
4.	Have you used Sweet William?	44,8	55,2
5.	Do you recognize the pancy (*Wiola x wittrockiana*)	75,9	24,1
6.	Have you used pancy?	34,5	65,5
7.	Do you recognize the canterbury bells (*Campanula medium*)	51,7	48,3
8.	Have you used Canterbury bells?	10,3	89,7
9.	Do you recognize the wall flower (*Cheiranthus cheiri*)	69,0	31,0
10.	Have you used wall flower?	13,8	86,2
11.	Do you recognize the common hollyhock (*Alcea rosea*)	79,3	20,7
12.	Have you used common hollyhock?	48,3	51,7

Conclusion

A survey has revealed the following facts. The subjects evaluated the decorative characteristics of the all annuals and biennials flower species and means of maintenance with a grade of „very good",

while their knowledge of the species is based on a percentage of: *Cucurbita pepo* (100%), *Tagetes erecta* (90%)*, Dianthus barbatus* (75,9%), *Begonia semperflorens* (67,7%), *Campanula medium* (51,7) etc. They would use in: garden, parks balconies / terraces. The subject are used in different percentages annuals and biennials flower species (*Cucurbita pepo* (83,3%), *Tagetes erecta* (70%), *Helianthus annuus* (56,7%), *Wiola x wittrockiana* (34,5%) etc.

Table 6. Evaluation of manners of usage of certain flowering species

Ordinal No.	Questions	A %	B %	C%
1.	Evaluate way of daisy (*Bellis perennis*) application in landscape. A) gardens B) parks C) balcony / terraces	17,2	75,9	6,9
2.	Evaluate way of Sweet William (*Dianthus barbatus*) application in landscape. A) gardens B) parks C) balcony / terraces	17,2	13,8	69,0
3.	Evaluate way of pansy (*Wiola x wittrockiana*) application in landscape. A) gardens B) parks C) balcony / terraces	31,0	69,0	0
4.	Evaluate way of Canterbury bells *Campanula medium*) application in landscape. A) gardens B) parks C) balcony / terraces	58,6	31,0	10,3
5.	Evaluate way of wall flower (*Cheiranthus cheiri*) application in landscape. A) gardens B) parks C) balcony / terraces	37,9	55,2	6,9
6.	Evaluate way of common hollyhock (*Alcea rosea*) application in landscape. A) gardens B) parks C) balcony / terraces	48,3	31,0	20,7

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