THE STUDY OF FLOWERING SHRUBS (FORSYTHIA, SYRINGA, COTONEASTER) CULTIVARS IN THE ENVIRONMENT ARCHITECTURE AND URBANE LANDSCAPE

N. BALAJ[1], L. HAXHINASTO[2] , F. HASANI[3], I. LUSHI[4], Filloreta BALAJ[5]

[1]European Institute 'Juridica'- Faculty of Public Policy and Management, Prishtina, Kosovo
[2]Agricultural University of Tirana, Albania
[3] Ministry of Environment and Spatial Planning – Prishtina, Kosovo
[4]SH.F.K.P. "Anadrini" Xerxe, Kosovo
[5]University of Prishtina, Kosovo
E-mail: agroalbi54@hotmail.com

Abstract: Using of plants and ornamental trees in urban areas, are an important element and have impact on environmental quality, besides the aesthetic aspect, green plants clean the air from carbon dioxide, gases, dust, etc. In Republic of Kosovo is increased the tendency for environmental regulation with different ornamental plant, in parallel with the expansion of urban centers, large cities, new houses, residential areas. Landscape architecture is the design of outdoor public areas, landmarks, and structures to achieve environmental, social-behavioral, or aesthetic outcomes. The name "landscape architecture" was ***invented*** *by a Scotsman in 1828. It uses the ancient skill of garden designers (to compose landform with water, vegetation, structures and paving) and applies this skill to the man-made landscape. The purpose of our work was the study of characteristics of flowering stage, ornamental values and used flowerin shurbs (Forsythia, Syringa, Cotoneaster)* cultivars, *as integral component in landscape architecture and urban design in Kosovo. Flowering shurbs are the most popular garden plant crop grown in the Kosovo. Three flowering shurbs with three cultivars have been studied: Forsythia x intermedia'Lynwood', Forsythiax intermedia' BetryceFerand' ,Forsythiaxintermedia' 'Boronxensis';Syringa vulgaris' Madame Lemoine', Syringa vulgaris 'Froebelii', Syringa vulgaris'Alba'; Cotoneaster dammeri 'Tom Thumb', Cotoneaster dammeri 'Coral Beauty', Cotoneaster dammeri 'Streibs Findling' . The experiment was conducted during 2009-2010, tested in a commercial farm in Prizren, Kosovo. During the vegetation were measured:blooming seasons, number of flowers, diameter of flowers, colour, and length of growth. From our study and the obtained results it is proved that the studied species (Forsythia, Syringa and Cotoneaster) have a very good blooming due to favourable climatic conditions in Kosovo, which affected the growth, quality and colour of the flowers. One of the first shrubs to bloom in spring, weeping Forsythia erupts with bright golden yellow flowers all along its bare leafless branches when most plants are still in winter dormancy.*

Key words: *Kosovo, flowering shurbs, landscape design, blooming period*

INTRODUCTION

Landscape architecture is the design of outdoor public areas, landmarks, and structures to achieve environmental, social-behavioral, or aesthetic outcomes. The name "landscape architecture" was invented by a Scotsman in 1828. It uses the ancient skill of garden designers (to compose landform with water, vegetation, structures and paving) and applies this skill to the man-made landscape.

Open space projects can cover landscapes such as residential, commercial, open space reserves, urban open space, greenways and developed public spaces. We strive to strike an effective balance between the fundamental requirements of civil engineering and the landscape architectural components of art, architecture and ecology.

It is well established that urban green areas provide a wide range of social, aesthetic, environmental and economic benefits (THOMPSON, 2002).

The importance of urban green spaces has been known for decades; however the relationship between urban livability and green areas as incorporated in overall urban green structures has become the focus of international studies especially during the last 10 to 15 years.

Forests, parks and other open spaces in and near cities offer attractive settings for outdoor recreation, both for daily (short-term) and longer-term use.

Countries such as the Netherlands have recognized the importance of green space for the quality of urban life and developed policies to cater for residents' demands for 'green living'.

Research has documented that access to green areas has a positive influence on visitors' wellbeing and can reduce stress-related illness such as mental fatigue and headaches, and additionally also can have a restitution effect (KAMP, I., LEIDELMEIJER, K, MARSMAN, G., HOLLANDER, A , 2003).

Urban vegetation can directly and indirectly affect local and regional air quality by altering the urban atmospheric environment. The four main ways that urban trees affect air quality are:

Temperature reduction and other microclimatic effects; Removal of air pollutants;Emission of volatile organic compounds and tree maintenance emissions; Energy effects on buildings.

Forsythia x intermedia- the flowers are produced in the early spring before the leaves, bright yellow with a deeply four-lobed flower, the petals joined only at the base, They are deciduous shrubs typically growing to a height of 1–3 m.

Syringa vulgaris is deciduous shrub - much loved for its hardiness and ability to produce masses of creamy white flowers throughout early summer, all being heavily scented. This hardy and easy to grow large shrub is great for back of border/informal screen 3m X 2.5 m.

Cotoneaster is a genus of deciduous, semi-evergreen and evegreen species, the majority of which are shrubs, and few are trees. Grown mainly for their decorative fruits, borne continuously all autumn and winter, for their often fragrant, bee-attracting flowers which are borne in late spring and for the bright red autumn leaves of the deciduous species.

The purpose of study has been the study of characteristics of flowering stage, ornamental values and used flowerin shurbs (*Forsythia*, *Syrginia* and *Cotoneaster*,) cultivars, as integral component in landscape architecture and urban design in Kosovo.

MATERIAL AND METHODS

Three flowering shurbs with three cultivars have been studied: Forsythia x intermedia'Lynwood', Forsythiax intermedia'Betryce Ferand', Forsythia x intermedia' 'Boronxensis'; Syringa vulgaris 'Madame Lemoine', Syringa vulgaris 'Froebelii ', Syringa vulgaris 'Alba'; Cotoneaster dammeri 'Tom Thumb', Cotoneaster dammeri 'Coral Beauty', Cotoneaster dammeri 'Streibs Findling'.

The experiment was conducted during 2009-2010, tested in a commercial farm in Prizren, Kosovo (Figure 1).

During the vegetation were measured:blooming seasons, number of flowers, diameter of flowers, colour, and length of growth etc.

The scheme of experiment rise was ''randomized block'' with four replications and 25 plants for each variety. Growth period that plants have and flowering stage in urban landscape design are studied from March to August under Kosovo climate conditions.

Kosovo is located in the central part of Balkan. Lies between 41°50'58" and 43° 51'42" of northern geographic latitude and 20°01'3 "and 21°48'02" of east geographic length.

Kosovo has an area of 10,908 km^2. The climate is continental-sized, with a dominant influence of Adriatic-Mediterranean climate in Dukagjini Plane, through the valley of Drin i Bardhe.

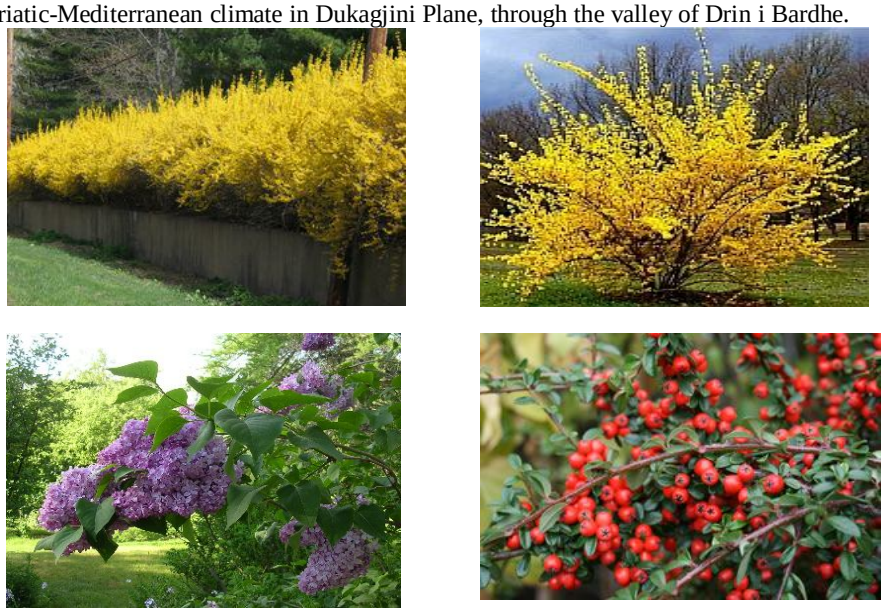

Figure 1. Experimental field of plants types in the study

RESULTS AND DISCUSSION

1. Dynamics of the blooming period of *Forsythia*, Syringa and *Cotoneaster* cultivars

***1 a*. Dynamics of the blooming period for Forsythia cultivars**

Dynamics of the blooming period by type *Forsythia* cultivars is presented in (figure 2). For all cultivars the blooming begins in March. There exists different number of flowers per plant. Maximum blooming (the largest number of flowers) is achieved in end of March, depending on the cultivars; the highest was recorded at the cultivar 'Lynwod' with (145) flowers per plant, the lowest one with (131) flowers at the cultivar 'Beatryce Ferand'. Blooming ends in late April. The smallest number of flowers was detected at the cultivar 'Boronxensis' with (13) flower per plant and the highest at cultivar ''Lynwod' with (17) flowers per plant.

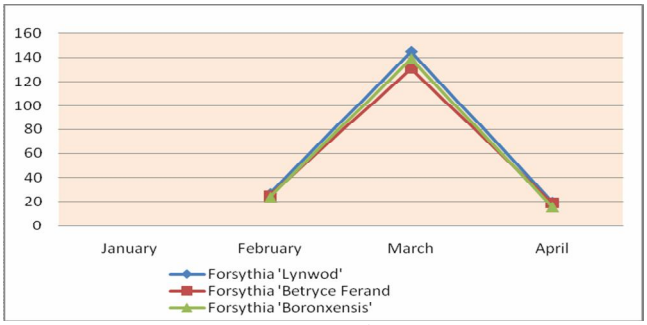

Figure 2. Blooming period of *Forsythia* cultivars

***1b*. Dynamics of the blooming period for Syringa cultivars**

For all cultivars the blooming begins in April. There exists different number of flowers per plant. Maximum blooming (the largest number of flowers) is achieved in middle of May, depending on the cultivars; the highest was recorded at the cultivar 'Alba' with (61) flowers per plant, the lowest one with (57) flowers at the cultivar 'Froebelii'. Blooming ends in late June. The smallest number of flowers was detected at the cultivar 'Diamond Jubilee' with (14) flower per plant and the highest at cultivar 'Alba' with (19) flowers per plant (Figure 3).

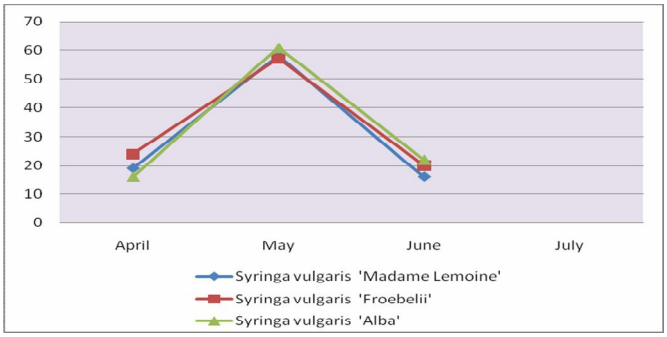

Figure 3. Blooming period of Syringa cultivars

1*c*. Dynamics of the blooming period for *Cotoneaster* cultivars

For all cultivars the blooming begins in June. There exist different number of flowers (3-6) per plant. The number of flowers per plant begins to increase in July and the highest is achieved at the cultivar 'Streibs Findling'(189), while the lowest one at the cultivar 'Tom Thumb' (175). Blooming ends in late July or early August. The smallest number of flowers was detected at the cultivar 'Streibs Findling' with 13 flower per plant and the highest at cultivar 'Tom Thumb' with 16 flowers per plant (Figure 4).

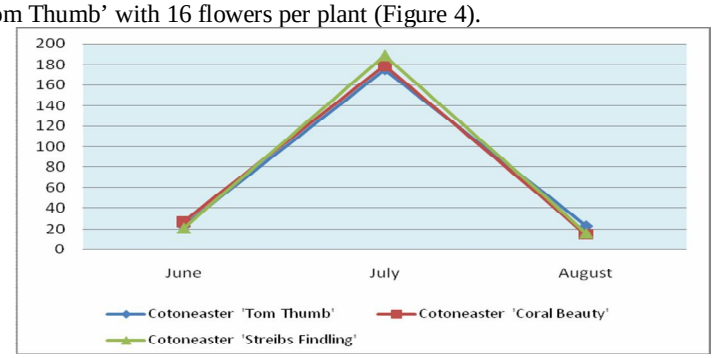

Figure 4. Blooming period of Cotoneaster cultivars

2. Morphological characteristics of *Forsythia, Syringa* and *Cotoneaster* cultivars

2*a*. Morphological characteristics of Forsythia cultivars

Morphological characteristicts of Forsythia cultivars are presented in *Table 1:*

Floral stem and Color of flowers

The length of the floral stem was between 66.7 cm 'Lynwood' and 56.6 cm 'Betryce Ferand '. This property is very important for cut flowers and the vigorous cultivars can also be used as individuals or in plant groups in landscape design. The average value of this character was 60.6 cm.The all cultivars studied have colors of flowers are Yellow.

Flower diameter

Flowers diameter is one of the most important qualitative characteristics of ornamental plants. From the results of the study for three cultivars it is demonstrated that the size of the flowers is different and it is an essential feature of the cultivar. The largest diameter of flowers has been achieved at the cultivar 'Betryce Ferand' (3.4 cm) and the cultivar 'Lynwood' has a smaller diameter of flowers (2.5 cm). Other cultivars are with a diameter of flowers in the average value between them.

Plant height

The average value for this parameter was 1.83 m , the most vigorous being 'Betryce Ferand' (2.2 m), ''Lynwood' (1.7 m), while the cultivar 'Boronxensis' was less vigorous (1.6 m) .

Table 1.

Morphological characteristics of *Forsythia, Syringa* and *Cotoneaster* cultivars

Scientific Name	Cultivars	Height plant (m)	Floral stem (cm)	Foliage color	Color flower	Diameter flower (cm)
Forsythia x intermedia	'Lynwood'	1.7	66.7	Green	Yellow	2.5
Forsythia x intermedia	'Betryce Ferand'	2.2	56.6	Green	Yellow	3.4
Forsythia x intermedia	'Boronxensis'	1.6	58.7	Green	Yellow	2.8
Syringa vulgaris	'Madame Lemoine'	2.5	33.5	Medium green	White	15
Syringa vulgaris	'Froebelii'	2.3	27.5	Medium green	Blue	17
Syringa vulgaris	'Alba'	2.2	30.5	Medium green	White	18
Cotoneaster dammeri	'Tom Thumb'	1.1	30.7	Dark green	Pink	1.0
Cotoneaster dammeri	'Coral Beauty'	1.2	28.5	Dark green	Pink	0.8
Cotoneaster dammeri	'Streibs Findling'	1.4	32.4	Dark green	Pink	1.1

2*b*. Morphological characteristics of *Syringa* cultivars

Morphological characteristics of *Syringa* cultivars are presented in *Table 1:*

Floral stem and Color of flowers

The length of the floral stem was between 33.5 cm 'Madame Lemoine' and 27.5 cm 'Froebelii'.This property is very important for cut flowers and the vigorous cultivars can also be used as individuals or in plant groups in landscape design. The average value of this character was 30.2 cm.

The cultivars studied have a range of colors from white ('Madame Lemoine' and 'Alba') and Blue ('Froebelii'). There is a large variation of varieties associated with the intensity of colors and have beautiful views of gardens.

Flower diameter

From the results of the study for three cultivars it is demonstrated that the size of the flowers is different and it is an essential feature of the cultivar. The largest diameter of flowers has been achieved at the cultivar 'Alba' (18 cm) and the cultivar 'Madame Lemoine' has a smaller diameter of flowers (15 cm).

2 *c*. Morphological characteristics of *Cotoneaster* cultivars

Plant height

The average value for this parameter was 1.2 m , the most vigorous being 'Streibs Findling' (1.4 m), 'Coral Beauty' (1.2 m), while the cultivar 'Tom Thumb' was less vigorous (1.1 m).

Flower diameter

The largest diameter of flowers has been achieved at the cultivar 'Streibs Findling' (1.1 cm) and the cultivar 'Coral Beauty' has a smaller diameter of flowers (0.8 cm). The all cultivars studied have colors of flowers are Pink.

Floral stem

The length of the floral stem was between 32.4 cm 'Streibs Findling' and 28.5 cm 'Coral Beauty'.

The average value of this character was 30.5 cm (Table 1).

CONCLUSIONS

In Republic of Kosovo is increased the tendency for environmental regulation with different ornamental plant, in parallel with the expansion of urban centers, large cities, new houses, residential areas.

Flowering shurbs are the most popular garden plant crop grown in the Kosovo. Hybrids of species like *Forsythia, Syringa* and *Cotoneaster*, have demonstrated high decorative value and period with flowers, good growing, leaves and flowers of different colours (white, yellow, pink, etc.).

From our study and the obtained results it is proved that the studied species (*Forsythia, Syringa* and *Cotoneaster*) have a very good blooming due to favourable climatic conditions in Kosovo, which affected the growth, quality and colour of the flowers.

One of the first shrubs to bloom in spring, weeping Forsythia erupts with bright golden yellow flowers all along its bare leafless branches when most plants are still in winter dormancy.

Lilac features showy panicles of fragrant white flowers rising above the foliage in mid spring. The flowers are excellent for cutting. It has bluish-green foliage throughout the season.

Cotoneaster generally fast growing shrub with attractive pink flowers and berries which tend to get wider than tall. The late spring flowers are not very showy, but they produce shiny red fruit.

For a good architecture of the urban landscape, the studied cultivars of *Forsythia, Syringa* and *Cotoneaster* species should be included in the planting structure.

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