

ORNAMENTAL PLANTS USED IN LANDSCAPE ARCHITECTURE DESIGN OF A BIBLICAL GARDEN

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Abstract

From the beginning of time, 'the Lord God planted a garden in Eden, and there He put the man he had formed'. Based on the historical accounts, there was always a connection between people and plants, and the concept of Biblical garden named in the Bible was created by using collections of edible and ornamental plants. The aim of the present study was to design and create a Biblical landscape in the 21st century, establishing the current needs of a Roman-Catholic parish green area in the centre of Cluj-Napoca, Romania. Concluding the importance and symbolism of a biblical landscape, the garden was design by following the thematic planting guidelines, using some of the ornamental plant's species (Buxus sempervivum, Cedrus deodara, Rosa sp., Iris germanica, Lilium candidum) mentioned in the Scripture. In the landscape architecture design process computer software's were used (ArchiCAD and Lumion) to achieve a realistic representation and a deeper understanding of the biblical layout concept. According to the project proposal, Biblical gardens can get a new meaning, evidencing also the morpho-decorative characteristics of ornaments by learning through landscape, where people can reconnect with plants in a residence full of history and spirituality.

Keywords: Bible, environment, healing, plants, sensory garden.

1. INTRODUCTION

The name of Biblical Gardens highlights the symbolism of specific landscape architecture space arrangement, using also a specific selection of ornamental plants mentioned in the Holy Bible. For nearly 80 years Biblical gardens have been present in the natural and cultural landscape, located in a public (Włodarczyk, 2019) or in a private space. This specific tip of green area spread all over the world, but the origin of it is in the lines of the Holy Bible. Though the location of the Garden of Eden, the description of it in Genesis leaves no question as to the beauty and extravagance of God's garden: 'This was the perfect home for man. It was created before sin. Its beauty was perfect'. The lush vegetation contained fruits and trees not seen on earth since. The environment existed in a perfect state of harmony, as man and animal coexisted without death or threat.

The Biblical gardens are cultivated collections of ornamental plants that are named in the Bible. A list of plants in the Bible includes species of plants mentioned in the Jewish and Christian scriptures. During the last few decades, several research studies indicate result regarding the identity of Biblical plant names (Moldenke, 1952; Feldmann, 1956; Felix, 1957; Zohary, 1982; Duke, 1983; Włodarczyk, 2007; Amar, 2012; Dafni and Böck, 2019). The monastic gardens were also part of a healing environment, mentioned by early Christian leaders that a sensory awakens in

nature can be a healing component for humans (Marcus Cooper and Sachs, 2014). Also, the hospital garden was a place where the Roman Catholic Church started to celebrate Mass, and in this regard the Ospedale Maggiore of Milan was built in 1458 to incorporate a green space visible from all rooms (Thompson and Goldin, 1975).

Włodarczyk (2007) counted and evidenced the number of plants which were mentioned in the Bible and concluded that the list contains 206 plant names, 95 of which “are recognized by all contemporary researchers of the floras of the Bible” (Dafni and Böck, 2019). Other plants with associations to the themes and subjects of the Bible are sometimes also included, especially in areas with different climates. According to this, a selective list was formed in order to obtain a specific list of ornamental plants suitable in a landscape design for a temperate climate (Table 1.), in correlation with the biblical reference.

Table 1. Selective list of ornamental plants used or mentioned explicitly in the Bible
source: https://en.wikipedia.org/wiki/List_of_plants_in_the_Bible and
<https://www.csu.edu.au/special/accc/biblegarden/plants-of-the-garden>

Reference number	Scientific name	Biblical references
Ornamental trees and shrubs		
1.	<i>Acacia raddiana</i>	Exodus 25:10
2.	<i>Buxus sempervirens</i>	Isaiah 41:19; 60:13
3.	<i>Cedrus deodara</i>	Psalms 92:12-13
4.	<i>Cedrus libani</i>	1 Kings 5:10, 2 Kings 19:23
5.	<i>Cercis siliquastrum</i>	Matthew 27:5
6.	<i>Cupressus sempervirens</i>	Isaiah 44:14
7.	<i>Juglans regia</i>	Song of Solomon 6:11, Genesis 43:11
8.	<i>Juniperus excelsa</i>	2 Chronicles 2:8; 9:10,11; 1 Kings 10:11, 12; Jeremiah 17:6, 48:6
9.	<i>Malus domestica</i> or <i>Citrus medica</i>	Genesis 2:7; Job 31:39; Jeremiah 15:9
10.	<i>Parthenocissus</i> sp.	Psalms 104:15; John 15:1
11.	<i>Populus</i> sp.	Isaiah 44:4
12.	<i>Quercus</i> sp.	Joshua 24:26
13.	<i>Salix alba</i>	Job 40:22
14.	<i>Ulmus minor</i>	Song of Solomon 5:11; 7:7, 8, John 12:13
15.	<i>Vitis vinifera</i>	Genesis 40:10
Ornamental flowers and aromatic plants		
16.	<i>Anemone coronaria</i>	Matthew 6:28
17.	<i>Convallaria majalis</i>	Song 2:1
18.	<i>Coriandrum sativum</i>	Exodus 16:31, Numbers 11:7
19.	<i>Crocus sativus</i>	Song of Solomon 2:1, Isaiah 35:1; Song of Solomon 4:14
20.	<i>Hyacinthus orientalis</i>	Song 6:2-3
21.	<i>Iris germanica</i>	1 Kings 7:22
22.	<i>Lilium candidum</i>	Song of Songs 2:1-2
23.	<i>Linum usitatissimum</i>	Proverbs 31:13
24.	<i>Mentha</i> sp.	Matthew 23:23; Luke 11:42
25.	<i>Narcissus pseudonarcissus</i>	Luke 12:27, Solomon 2:1, Matthew 6:30
26.	<i>Nigella arvensis</i>	Isaiah 44:14
27.	<i>Papaver somniferum</i>	Isaiah 40:6
28.	<i>Portulaca oleracea</i>	Job 6:6
29.	<i>Rosa</i> sp.	Solomon 2:1
30.	<i>Salvia</i> sp.	Exodus 37:17-18

The Biblical garden arrangement is based on Old and New Testament texts, in which plants are mentioned (Włodarczyk, 2004), but in the modern landscape, can be identify several green areas design based on those principles. More than 64 gardens situated in 14 countries were identified (Włodarczyk and Kapczyńska, 2019) and the source of inspiration to create those design followed different objectives in the design process (Figure 1). In the listed twenty-three types of inspirations, the most obvious response was regarding the *Popularization of the Bible*, and the less obvious reason was the *Willingness to know the Christian faith by Muslims*, *Reconstruction of a disused Biblical garden* or the *Popularization on the Far East religions*.

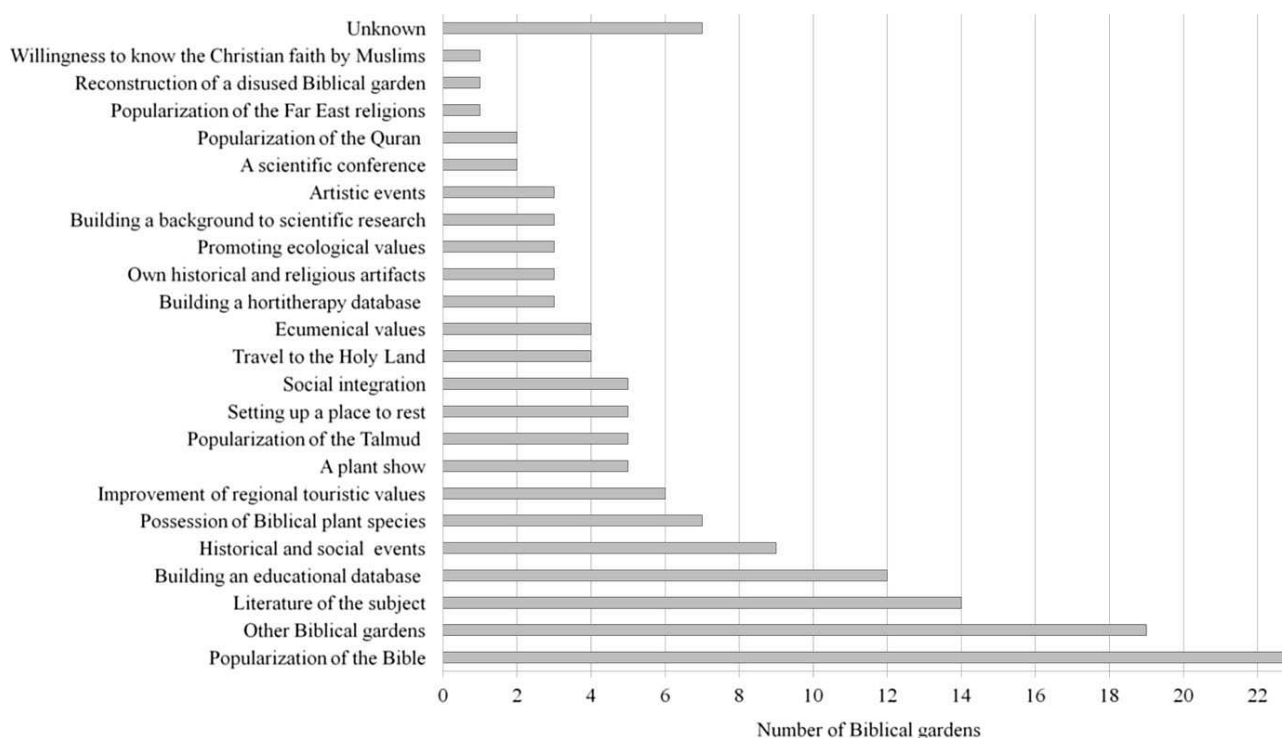


Figure 1. The inspiration types for the creation of Biblical gardens
 source: Włodarczyk and Kapczyńska, 2019

A biblical garden is also a functional green space, part of the burial grounds category like cemeteries (Swanwick et al., 2003), and mainly, this type of arrangement constitutes a systematically organized framework (Iliescu, 2003). According to several research studies about the mapping priorities for green and public urban space, biblical gardens are part of the cemeteries, disused churchyards and other burial ground (Bell et al., 2007; Ciobota et al., 2017), between parks and gardens, natural and semi-natural spaces, green corridors, outdoor sports facilities, amenity green spaces, provision for children and young people, allotments, community gardens and urban farm and public space. In this regard, a churchyard green area should evidence a good landscape perception, in case of planting all areas must be well covered and follow a specific design pattern (Iliescu, 2003; Bell et al., 2007; Dumitraș et al., 2008).

2. MATERIALS AND METHODS

The present biblical garden project proposal was design for the Schleunig House, built in Gothic style, the is known today as the House of the Roman Catholic Parish and is the headquarters of the Roman Catholic Archdiocese of Cluj and the parish of St. Michael's Church, located on 16 Piața Unirii Street. The interior green atrium was reconstructed in 2016, based on the concept that visitors can spiritual connection through meaningful biblical landscape to Divinity.

More specifically, the larger site is situated in front of the interior main entrance for the Roman Catholic parish, which is of the oldest buildings in the historic center of Cluj-Napoca – Schleunig House. Schleunig House, how is known in Cluj-Napoca, was constructed in 1450, and the name of the building comes from Gregorius Schleunig, parish priest of the city between the years 1450-1481. The building also stands out due to the two remarkable bas-reliefs. The first does not go unnoticed, because it is above the entrance and depicts Saint Michael, being the work of the sculptor Anton Schuchbauer. To discover the second bas-relief you need to enter the building, because it is located upstairs and recalls the visit to Cluj-Napoca of Emperor Joseph II in 1773 (<https://www.clujlife.com/2020/03/06/7-dintre-cele-mai-vechi-cladiri-din-cluj-napoca/>).

The green space measures more than 600 sq. m (Figure 2), surrounded all over by 3 level high buildings, and that's why the light is limited in this area. Half of the presented surface is cover with pavement, to facilitate the pedestrian access for each entry. In this case, the green space of the biblical garden divided into two zones of almost symmetrical shape. In the landscape architecture design process computer software's were used (ArchiCAD and Lumion) to achieve a realistic representation.



Figure 2. Plan view of the biblical garden of Roman Catholic parish, St. Michael's Church Cluj-Napoca

The spring planting design layout was made using bulbs (Table 2) and hedged formed by *Forsythia x intermedia* an ornamental shrub with bright yellow flowers and *Ligustrum vulgare*. In the

vegetation period, the perennial selection (*Euonymus fortunei*, *Hosta* sp., *Hemerocallis* sp., *Dryopteris filix-mas*) offers a dynamic layout for the entire garden, inspired by the plants mentioned in the Bible. To enjoy the view, seating areas were set around the fountain, a place where people rest, wait and also meditate. The grass lawn was surrounded by mature coniferous, which provide shade during summertime. Near to the building accesses, a border line was designed with bulbs (*Narcissus pseudonarcissus*, *Crocus* sp.), perennials (*Iris germanica* and *Hemerocallis* sp.), fragrant inflorescences (*Lilium candidum*, *Rosa* sp.), shrubs (*Juniperus* sp., *Buxus sempervirens*) and roses showed in Figure 3.

Table 2. Planting material used in the bulbs planting design combination

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No.	SPECIES	Planting material	Planting plan
		Quantity	Unit
		(pieces)	(pieces/square meter)
Springtime decoration			
1	<i>Allium giganteum</i>	30	9-12
2	<i>Allium moly</i>	30	15-20
3	<i>Hyacinthus orientalis</i>	60	65
4	<i>Narcissus pseudonarcissus</i>	60	65
5	<i>Tulipa gesneriana</i>	60	65
Summertime decoration			
6	<i>Lilium candidum</i>	60	7-12



Figure 3. View on the biblical garden and office accesses of Roman Catholic parish, St. Michael's Church Cluj-Napoca

As can be observed, some of the existing massive coniferous vegetation has been preserved. Creating a larger pedestrian area, paved to facilitate a better access to each entry, the rain lawn area was approximate 300 sq. m, surface which represents half of the vegetal landscape. The proposed ornamental based on bulbs, perennial and coniferous shrubs, considered a design of a decorative landscape throughout the year. The centers of interest or focal points of this landscape are the

biblical plants, which have different periods of flowering and decoration, through spring and summertime. The winter decoration is accomplished by the coniferous trees and shrubs.

3. RESULTS AND DISCUSSIONS

The garden displays a variety of biblical ornamental plants and trees, reintegrated in a modern landscape. In the past, this garden was full of over developed plants and trees, which made a smaller and shaded area, unattractive. This inner courtyard is in the middle of many accesses, a place where many people are passing through every day to get to the church offices, shop, meeting rooms, kindergarten and parking area. Thus, the transversal pedestrian access was kept offering an easy quick walking through the garden, surrounded by meaningful ornamental plant species.

The main entrance through in possible accessing 16 Piața Unirii Street of Cluj-Napoca city. Along the access the landscape is visually divided into two main areas, pedestrian paved place, bordered by seating zones and ornamental hedge, and the planting area or the biblical landscape in the north part of the interior patio (Figure 4). The central and sensory element of this landscape design, besides the lush vegetation is given by the fountain, which symbolizes the Holy Baptism.



Figure 4. View from street access of Roman Catholic parish, St. Michael's Church Cluj-Napoca

Based on the planting design combination, Table 3 presents the selected bulb and perennial species flowering phenology (Cantor et al., 2007; Toma, 2009; Draghia and Chelariu, 2011; Lord and Lawson, 2012, Buta et al. 2013). A designing which uses ornamental plants in a landscape architecture project should be in accordance with project theme, building decorations, shape and colour, and also blooming period. It can be seen that, the predominant colours are the complementary shades as yellow and purple, combined with white flowers and green foliage of lawn and conifers.

The design proposal aim was to design a green space consisting the principles of a biblical landscape, in accordance with the spring and summer decoration period, when this patio is the most used. Taking into consideration the use of biblical ornamental plants, the created layouts of floral mosaic carpet with bulbs, the focal points such as a solitary tree (*Cedrus deodara*) or an alignment of roses, were the main elements of the landscaping proposal (Figure 5).

Table 3. Blooming time and habitat of ornamental plants selection

No.	SPECIES	Decoration time												Habitat
		Spring			Summer			Autumn			Winter			Height
		J	F	M	A	M	J	J	A	S	O	N	D	(cm)
Bulbs														
1	<i>Allium giganteum</i>													150
2	<i>Allium moly</i>													50
3	<i>Hyacinthus orientalis</i>													15-25
4	<i>Lilium candidum</i>						X	X						120
5	<i>Narcissus pseudonarcissus</i>													35
6	<i>Tulipa gesneriana</i>													40
Perennials														
7	<i>Hemerocallis fulva</i>													120
8	<i>Hosta fortunei</i>													40-50
9	<i>Iris germanica</i>													90
10	<i>Rosa sp.</i>													60-90

**Figure 5. View on the constructed biblical garden of Roman Catholic parish, St. Michael's Church Cluj-Napoca**

4. CONCLUSIONS

The purpose of the present study was to design a unique biblical garden in the center of Cluj-Napoca. The biblical garden is a great place to spend time, to think and pray. The skilled guides of the Garden take visitors through a minimum 20-minute journey of Biblical stories, considering roses as – ‘we are roses’ like Solomon sad, *Buxus sempervirens* - Holy Spirit and *Cedrus* tree was used by Noe to create his boat. Also, the water element is the symbolism of John the Baptizer, from the New Testament. It is a wonderful opportunity to grow in a deeper understanding of the Biblical

text, surrounded by meaningful ornamental plants, where visitors are also welcomed to sit and enjoy the biblical landscape, in a quite green courtyard in the heart of Cluj-Napoca.

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6. REFERENCES

- Amar, Z. (2012). Plants of the Bible. *Reuben Mass*: Jerusalem.
- Bell, S., Montarzino, A., Travlou, P. (2007). Mapping research priorities for green and public urban space in the UK. *Urban Forestry & Urban Greening*, 6(2), 103-115.
- Buta, E., Buta, M., Cantor, M., Hort, D., & Husti, A. (2013). Use of Ornamental Plants on Different Soil Types from Transylvanian Plain. *Scientific Papers-Series B, Horticulture*, (57), 295-298.
- Cantor, M., Dumintras, A., Zaharia, D. (2007). Plante bulboase utilizate în amenajări peisagistice [Bulbs plants used in landscape], Toderescu Cluj-Napoca.
- Ciobota, A., Weber, C., Rusu, R. R., Condoros, A., Boanca, P. I., Bors-Oprisa, S., Raducu-Lefter, A., Bedeleian, R. I., Koos, T. A., Sirca, M. T., Mihalciuc, I. (2017). Good practice guide for green space management - Ghid de Buna Practica pentru Administrarea Spatiilor Verzi, *Universitatea de Vest publishing house - Agora Collection*, Romania.
- Dafni, A., Böck, B. (2019). Medicinal plants of the Bible - revisited. *Journal of ethnobiology and ethnomedicine*, 15(1), 57.
- Draghia, L., Chelariu, E. L. (2011). *Floricultură* [Floriculture]. Ion Ionescu de la Brad, Iași.
- Duke, J.A. (1983). *Medicinal Plants of the Bible*. Trado-medic books, London.
- Dumitraș, A., Singureanu, V., Sabo, G. (2008). *Principii generale de proiectare și amenajare a spațiilor verzi* [General principles of design and arrangement of green spaces], Ed. AcademicPres, Cluj Napoca.
- Feldmann, U. (1956). *Plants of the Bible*. Dvir: Tel Aviv.
- Felix, J. (1957). *Plant world of the Bible*. Massada: Tel Aviv
- Iliescu, A. F. (2003). *Arhitectură peisageră* [Landscape architecture]. Ceres, Bucharest.
- Jacob, W. (1993). Medicinal Plants of the Bible - Another View. In *The Healing Past* (pp. 27-46). Brill.
- Marcus, C. C., & Sachs, N. A. (2013). *Therapeutic landscapes: An evidence-based approach to designing healing gardens and restorative outdoor spaces*. John Wiley & Sons.
- Moldenke, H. N., Moldenke, A. L. (1952). *Plants of the Bible*. Ronald Press, New York.
- Swanwick, C., Dunnett, N., Woolley, H. (2003). Nature, role and value of green space in towns and cities: An overview. *Built Environment* (1978), 94-106.
- Thompson, J. D., Goldin, G. (1975). The Hospital: A Social and Architectural. History (pp. 25-27). New Haven: *Yale University Press*.
- Toma, F. (2009). Floricultură și artă florală, vol. IV *Specii utilizate pentru decorul parcurilor și grădinilor* [Floriculture and floral art, vol. IV: Species used for parks and gardens]. INVELMultimedia, Bucharest.
- Włodarczyk, Z. (2007). Review of plant species cited in the Bible. *Folia Horticulturae*, 19(1), 67-85.
- Zohary, M. (1982). *Plants of the Bible*. Cambridge University Press. Cambridge.
- *** (2017) List of plants in the Bible. Retrieved May 20, 2020, from https://en.wikipedia.org/wiki/List_of_plants_in_the_Bible
- *** (2020) The Bible Garden. *Plants Of The Garden*. Retrieved May 20, 2020, from <https://www.csu.edu.au/special/accc/biblegarden/plants-of-the-garden>
- *** (2020) 7 dintre cele mai vechi clădiri din Cluj-Napoca - *Casa Schleunig Piața Unirii, nr. 15-16*. Retrieved May 28, 2020, from <https://www.clujlife.com/2020/03/06/7-dintre-cele-mai-vechi-cladiri-din-cluj-napoca/>