



Features of biological diversity of vegetation when designing the territory of the saint Mikolaivsky female monastery in Zaporizhzhya

Derevianko N ^{1*}, Khoroshkov L ², Melnikova I ³

¹ Candidate of Agricultural Sciences, Associate Professor, the Department of Park Gardening and Landscaping, Khortytsia National Academy, Naukove Mistechko St., Khortytsia Island, Zaporizhzhia, Ukraine

^{2,3} Lecturer, Department of Park Gardening and Landscaping, Khortytsia National Academy, Naukove Mistechko St., Khortytsia Island, Zaporizhzhia, Ukraine

* Corresponding Author: **Derevianko N**

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Abstract

During the work, an inspection of the object was carried out. The data of the surveyed territory became the basis for the development of project proposals for improving the greening of the territory. The area of the territory is 936.5 m².

As a result of the inventory, it was established that there are tree and shrub plantations on the territory to be greened, which are in unsatisfactory condition and require uprooting. The rest of these plantations are in good condition and perform their sanitary, hygienic and aesthetic functions well.

Research and study of materials about monastery gardens were carried out. In order to achieve functionality, economic efficiency and aesthetic appeal, the planning project was conditionally divided into three functional zones – «passage zone», «pharmacist's garden» and «paradise garden».

Keywords: Landscaping, monastery garden, project proposals, tree and shrub vegetation

1. Introduction

The monastery garden is a canonical form of landscape art, which is a combination of: landscape (relief and vegetation), utilitarian gardens and vegetable gardens. The monastery garden is based on the Christian worldview. In the garden in the courtyard of the monastery, small trees grew – fruit or decorative, medicinal and spicy herbs and flowers ^[1-3].

Monastery gardens have gone through a significant path of development – from small courtyards with a cross-shaped arrangement of alleys to garden and park complexes of considerable size. Everything here is symbolic. Old buildings are a symbol of wise unpretentiousness and simplicity, clear lines of garden beds are a symbol of limitations, the shape of the cross is the basis of everything, vegetables and fruits are a symbol of the simplicity of life, flowers are a symbol of God's beauty and the shortness of human life.

In the monastery gardens of Ukraine, the «Paradise tree» was necessarily grown – apple, grape, pear, cherry, walnut, viburnum. In addition to fruit trees, grapes, vegetables, flowers and rose gardens were grown, as well as decorative and medicinal plants. Hospitals were often attached to monasteries, so there were apothecaries' gardens on the territories where medicinal plants were grown. Natural dye plants were used to decorate manuscripts. The fragrant herbs in the garden were a breath of fresh air. The healing qualities of valerian, St. John's wort, nettle, water pepper and chamomile were known ^[4-6].

2. Materials and methods

The research was conducted in 2021–2022 on the territory of the women's monastery, which is located in the Komuar district of the city of Zaporizhzhia.

A survey of the proposed territory was carried out, taking into account the peculiarities of the terrain. Determination of the mechanical composition of the soil was carried out by the «wet» method of N.A. Kaczynski ^[7, 8]. The reaction of the soil solution was determined using Alyamovskiy's device. Soil color and structure were visually determined.

The inventory of existing plantations, engineering networks, buildings and structures was carried out in accordance with the «Instructions for the inventory of green plantations in populated areas of Ukraine»^[9].

3. Research results

As a result of the inventory, it was established that there are tree and shrub plantations on the territory to be greened.

Some of these plantations are in good condition and perform their sanitary, hygienic and aesthetic functions well, but there are also those plantations that are in unsatisfactory condition and require uprooting – bitter chestnuts and two boxwood bushes. Information on the inventory of plantations is given in the appendices. According to the data of the plantation inventory, we determine the species and breed composition of trees and shrubs, which is shown in Table 1.

Table 1: Species composition of trees and shrubs

№	Breed, Type		Quant., items.	Share of breed, species in total plantations, %
	Names	Latin name		
1.	Birch hung	(<i>Betula pendula</i>)	3	3,53
2.	Spirea Wangutta	(<i>Spiraea vanhouttei</i>)	28	32,94
3.	Western thuja Emerald	(<i>Thuja occidentalis Smaragd</i>)	11	12,94
4.	Boxwood evergreen	(<i>Buxuc sempervirens</i>)	4	4,7
5.	The white turf	(<i>Comus alba</i>)	10	11,76
6.	Hybrid tea roses	(<i>Rosa Chopin</i>)	4	4,7
7.	Common rosehip	(<i>Rosa canina</i>)	2	2,35
8.	Common viburnum	(<i>Viburnum opulus</i>)	1	1,18
9.	Bitter chestnut	(<i>Aesculus hippocastanum</i>)	12	14,11
10.	Cossack juniper	(<i>Juniperus sabina</i>)	4	4,7
11.	Common linden	(<i>Tilia cordata</i>)	2	2,35
12.	Spruce dove	(<i>Picea pungens f. Glauca</i>)	4	4,7

As a result of the inventory, it was found that there are tree and shrub plantations on the territory to be landscaped. All the trees of common horse chestnut (*Aesculus hippocastanum*), two bushes of evergreen boxwood (*Buxuc sempervirens*) and one bush of Cossack juniper (*Juniperus sabina*) are in an unsatisfactory condition, because they have lost their decorative qualities and do not fulfill their sanitary, hygienic and aesthetic functions, so they need rooting. *Spiraea vanhouttei* and *Thuja occidentalis Smaragd* are in satisfactory condition, they need trimming. There is no turf on the territory.

Examination of soil conditions. Through soil analysis, you can get important information and improve the condition of the soil, because fertility is the key to yield. By determining the level of acidity and the composition of nutrients, it is

possible to determine the type of fertilizers and their amount that must be applied to improve the soil.

A soil survey was carried out on the planned territory according to the following indicators: Soil acidity – pH=7.0 – neutral. The structure of the soil is lumpy and granular. The mechanical composition of the soil is light loam. The color of the soil is light gray. Soils with this color contain less than 4% humus.

4. Results and Discussion

General planning composition and landscape–spatial organization of the territory. The architectural and planning composition of the projected territory is subject to change. The design is done in a regular style.

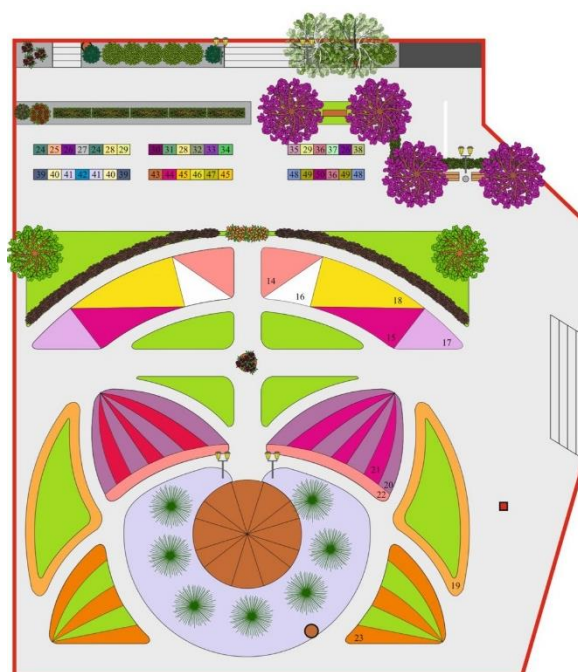


Fig 1: Landscaping and landscaping plan

Research and study of materials about monastery gardens were carried out for the basis of the project. In order to achieve functionality, economic efficiency and aesthetic appeal, the planning project was conditionally divided into three functional zones – «passage zone», «pharmacist's garden» and «garden of paradise».

«Passage zone» – provides the main entrance to the territory of the St. Nicholas Monastery, on the side of which there is a small parking lot for two cars. This parking lot is separated by a hedge from another area where there is a small rest area with two benches. Walking along the path from the main entrance on one side, there are three flower beds above the building, and two on the other. Tree and shrub vegetation is provided in this zone. For the decorative design of the plot, it is planned to grow apple trees on a horizontal trellis.

«Apothecary garden» – provides wooden beds with medicinal and spicy herbs. These herbs look quite decorative, are not demanding in care, have an attractive aroma and a special color.

«Paradise Garden» – includes an arch with campsis, modular flower beds on which flowers and lawns grow, and a gazebo surrounded by conifers.

The gazebo was created for quiet rest and for viewing the scenery, so benches will be installed in it. In the internal marking of the main path in the garden, a cruciform layout can be seen. The labyrinth of flower gardens of the «Garden of Paradise» is a traditional sign of the complex path of the human soul to God. There are also flower beds with lawn, the main qualities of which are durability and decorativeness.

They use the protective and spatially organizing functions of green spaces in the process of forming landscape objects. In order to create long-lasting and resistant to the influence of anthropogenic environmental factors, it is necessary to use acclimatized or local species of trees and shrubs that were grown in urban or suburban nurseries ^[10].

Green areas that are in unsatisfactory condition will be removed in three stages. At the first stage, trees are pruned. On the second, the trunk is cut. At the third stage, grubbing is carried out – the stump with roots is removed. The assortment of plants is selected according to the soil and climatic conditions of the district ^[11-14].

The assortment of woody, shrubby and herbaceous plants, taking into account their characteristics, is shown in Table 2.

Table 2: Assortment of trees, shrubs and grasses plants (projected)

№	Breed, type	Quant., Items
	Latin name	
1.	(<i>Rosa Chopin</i>)	6
2.	(<i>Buxuc sempervirens</i>)	2
3.	(<i>Spiraea vanhouttei</i>)	50
4.	<i>Betula pendula</i>	2
5.	<i>Rosa canina</i>	1
6.	<i>Viburnum opulus</i>	1
7.	<i>Malus domestica</i> «Gloster»	5
8.	(<i>Paulównia fargesii</i>)	4
9.	(<i>Mentha crispa</i>)	20
10.	(<i>Althaea officinalis</i>)	20
11.	(<i>Lavandula angustifolia</i> «Provans»)	40
12.	(<i>Coriandrum sativum</i> «Caribe»)	40
13.	(<i>Caléndula officinális</i>)	40
14.	(<i>Anethum graveolens</i>)	40
15.	(<i>Thymus pulegioides</i>)	20
16.	(<i>Petroselinum crispum</i>)	20
17.	(<i>Pimpinella anisum</i>)	20
18.	(<i>Ocimum basilīcūm</i>)	20
19.	(<i>Origanum vulgáre sipyleum</i>)	20
20.	(<i>Salvia officinalis</i>)	20
21.	(<i>Echinacea purpurea</i>)	40
22.	(<i>Melissa officinalis</i>)	20
23.	(<i>Rosmarinus</i> «Blue Winter»)	20
24.	(<i>Levisticum officinale</i>)	40
25.	(<i>Matricaria chamomilla</i>)	40
26.	(<i>Artemisia maritima</i>)	40
27.	(<i>Hypericum hirsutum</i>)	20
28.	(<i>Leonurus cardiaca</i>)	20
29.	(<i>Origanum vulgare</i>)	20
30.	(<i>Carum carvi</i>)	40
31.	(<i>Tanacetum vulgare</i>)	20
32.	(<i>Chelidonium majus</i>)	20
33.	(<i>Lobelia siphilitica</i>)	40
34.	(<i>Achillea ptarmica</i>)	40
35.	(<i>Verbena officinalis</i>)	40
36.	(<i>Tilia cordata</i>)	2
37.	(<i>Campsis radicans</i> «Speciosa»)	2
38.	(<i>Physocarpus opulifolius</i> «Lady in Red»)	14
39.	Rolled lawn	110,6 m ²
40.	(<i>Alyssum</i> «Gmelinii Palette»)	30

41.	(<i>Narcissus Double «Delnashaugh»</i>)	150
42.	(<i>Phlox subulata «Emerald Cushion Blue»</i>)	40
43.	(<i>Aster «Marjorie»</i>)	36
44.	(<i>«Alice Haslam»</i>)	54
45.	<i>Heuchera hybrida «Regina»</i>	200
46.	(<i>«Lightning Sky»</i>)	136
47.	(<i>Petunia «Special Pink Splash»</i>)	50
48.	(<i>Petunia «Special Burgundy Splash»</i>)	92
49.	(<i>Tagetes «Moonlight»</i>)	92
50.	(<i>Thuja occidentalis «Smaragd»</i>)	7

5. Conclusions

The project of the monastery garden will have features of a regular planning style. In order to achieve functionality, economic efficiency and aesthetic appeal, the territory will be conditionally divided into 3 parts – «Passage zone», «Apothecary garden» and «Paradise garden». An assortment of plants was selected for landscaping the site of the nunnery in accordance with the soil and climatic conditions of the location of the territory, as well as in accordance with the requirements of the chosen stylistic direction of the landscape. An expanded assortment of plants contributes to the improvement of the aesthetic and decorative qualities of the site, as well as to the improvement of the ecological condition of the territory.

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