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HOSPITAL PLANT APPLICATION IN THE CONTEXT OF HORTICULTURAL THERAPY

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ABSTRACT

With the continuous development of the economy and the improvement of medical technology, the medical model is also changing accordingly, and people are no longer satisfied with hospitals that only have good medical technology. In recent years, with the popularity of horticultural therapy, people have also begun to pay attention to the impact of hospital outdoor environments on physical health, rather than just pursuing beauty. In this research, the current planting configuration of each hospital was investigated and analyzed. The suitability, ornamental and healing values of the existing plantings in each hospital were evaluated using the Analytic Hierarchy Process (AHP) method and the Fuzzy Comprehensive Evaluation method. After getting the grades and scores of three hospitals, a problem tree was constructed to find the weaknesses of the existing planting configurations and then lists of recommended plants based on these weaknesses were provided. Finally, sites in three hospitals were selected to make new designs based on strategies to provide a reference for the application of horticultural therapy in Budapest hospitals.

Keywords: horticultural therapy, Analytic Hierarchy Process, hospital, plant landscape, plant application

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1 INTRODUCTION

1.1 Background

With the rapid progress of urbanization, cities are facing serious environmental pollution issues, such as water and air pollution. People are increasingly concerned about the relationship between the surrounding environment and their health, and recognize the importance of a healthy urban environment to their well-being. As a result, efforts are being made to improve the cities we live in. Various urban public green spaces, including parks, residential green areas, and street greenery, are key components of the urban environment. The quantity and area of these green spaces are increasing in the city.

Hospitals as important components of urban development, serve as specific places for disease treatment and health recovery for patients and specific populations. A hospital with advanced equipment and high medical standards cannot be considered a good medical institution if its environmental quality is poor, nor can it serve the public effectively. Given the special functions and target populations of hospitals, hospital green spaces have always been regarded as unique urban public green spaces. Therefore, the requirements for hospital environments are different from other types of urban public green spaces. Hospitals need more than just aesthetics; they require a healthy and comfortable outdoor environment. As medical technology continues to advance, people's demands for hospitals have evolved from purely "physiological" health needs to multi-level "physiological and psychological" health needs. This has not only driven changes in the medical model but also promoted the development of hospital outdoor environments (Xiong Yun, 2012).

Garden plants are the main components of urban garden environments and play various roles, such as carbon sequestration, oxygen release, dust control, windbreak, air purification, and reduction of urban heat island effect, as well as landscape beautification. Since the introduction of the ecological concept, the ecological principles of garden plant landscape design have been widely applied to various garden and green space constructions. In the construction process, a large number of ornamental plants have been used in urban environmental development. Hospitals have also seen an increase in green

spaces, with a greater emphasis on aesthetics. As people's understanding of nature deepens, the demand for outdoor environments has evolved from the initial functions of greening and beautification to ecological and healthcare functions. The green spaces in hospitals are important areas that reflect the hospital's image and improve patient comfort. A well-designed hospital green space can promote patient recovery and contribute to treatment. For hospital staff, a good hospital green environment can alleviate work pressure and provide a calming atmosphere, leading to more efficient work. Therefore, the requirements for hospital environments have expanded beyond mere beautification to encompass healthcare and auxiliary treatment. However, at present, designers often focus more on the aesthetic effects of hospital outdoor environments. In plant landscape design, there is often a greater emphasis on creating a beautiful environment using the aesthetic characteristics of plant landscapes, while neglecting the positive impact of outdoor garden spaces on patient recovery. This contradicts the expectations people have for hospital environments (Wang et al., 2023).

With the enhancement of people's health consciousness and the increasing demand for ecological environments, therapeutic landscapes, as an emerging form of garden landscapes, are gradually gaining attention and recognition. Ian McHarg (2005), in his book ‘Design With Nature’, tells the story of his recovery from tuberculosis in the beautiful scenic environment of the Alps. During his recuperation, the therapeutic landscape played a significant role in his recovery. Therapeutic landscape is a new type of landscape that creates environmental factors with health-promoting effects on the physical and mental well-being of individuals. It has therapeutic and restorative effects on certain physiological or psychological ailments. In the 1970s, the United States established the world's first national-level "Horticultural Therapy" association, which further drew the attention of many scholars to therapeutic landscapes. In addition to theoretical research, there have been many successful practical examples of therapeutic plant landscapes in hospitals. After World War II, some hospitals started incorporating gardens with therapeutic properties into their outdoor environments. For example, the Healing Garden at the Portland Burn Center was designed to provide shade for burn patients and included large shade trees, climbing plants such as *Lonicera japonica*, *Clematis*, and vine roses (Mei-xua, 2015). Plants are important

components of hospital outdoor spaces, and their contribution to the improvement and beautification of the environment is not only limited to visual aesthetics but also extends to olfactory, auditory, tactile, and gustatory experiences, providing a pleasant sense of well-being. Integrating therapeutic landscapes with hospital plant landscapes not only complements modern healthcare but also reflects the humanization of hospitals, thus enhancing the trust between medical professionals and patients.

In recent years, with the deepening research on plant visual, auditory, tactile, and olfactory aspects in therapeutic gardens, the appropriate and reasonable combination of various plants has become a hot topic among scholars. Early hospitals were influenced by urban planning, land availability, funding, and population size, resulting in a limited number of landscapes with therapeutic qualities. Through literature research, it was found that the landscapes of Budapest hospitals have value and space for improvement. The city has abundant urban vegetation and relatively developed economy, which are favorable factors for the implementation of horticultural therapy. Therefore, Budapest was chosen as the city for plant application research (Németh, 2008; Pap, 2017; Wittmann, 2015).

Based on this background, this study conducted on-site investigations at three comprehensive hospitals in Budapest, analyzed the diversity of garden plants in the hospital, summarized the patterns of plant arrangement, identified existing issues, and proposed relevant suggestions based on the theory of horticultural therapy. The aim is to provide reference for the selection and arrangement of plants in the outdoor spaces of Budapest hospitals with a focus on creating therapeutic landscapes.

1.2 Research Goals and Relevance

1.2.1 Research objectives

In our daily lives, comprehensive hospitals have a significant impact. As social healthcare institutions, comprehensive hospitals are generally large in scale, equipped with complete departments, and have relatively advanced medical technology and personnel. Patients often choose these hospitals for medical treatment considering the availability of medical resources. Compared to specialized hospitals, comprehensive hospitals attract a

more diverse patient population, making them more representative and influential. As a distinctive part of urban green space systems, the construction of plant landscapes in the outdoor spaces of comprehensive hospitals should not solely focus on achieving green space ratios but should prioritize the relationship between outdoor plant landscapes and hospital users (medical staff, patients, visitors, etc.) (Ding Chuanhua, 2015).

This research has two main objectives: Firstly, to establish a theoretical foundation for the study of plant landscapes in the outdoor spaces of comprehensive hospitals. Since plant landscapes are constructed based on hospitals, they possess unique characteristics that set them apart from other types of plant landscapes, such as those found in campuses, cities, or residential areas. This uniqueness is closely tied to the social status and functions of hospitals. Through on-site investigations of three comprehensive hospitals, this study conducts a general analysis of the frequency of plant applications and patterns of plant arrangement in the outdoor spaces of comprehensive hospitals. It includes maps and tables summarizing the current status of plant configurations in the outdoor spaces of three large comprehensive hospitals, identifies existing problems, and provides corresponding suggestions for improving these issues, thereby offering a basis and guidance for the improvement of plant landscapes in the outdoor spaces of comprehensive hospitals.

Secondly, to provide practical references for the configuration of plant landscapes in hospital outdoor environments guided by horticultural therapy. This research systematically compiles and summarizes relevant literature on therapeutic landscape design, combines it with on-site investigations, and based on horticultural therapy, identifies landscape plants suitable for horticultural therapy in Budapest. It explores optimization strategies for horticultural therapy in hospital outdoor environments and designs specific areas from the perspective of plant configuration. When constructing plant landscapes in outdoor spaces of other types of hospitals, this research provides valuable practical references.

1.2.2 Research importance

(1) Academic level

From an academic perspective, at the current stage, although there has been nearly

40 years of comprehensive research on horticultural therapy, the overall research has been primarily theoretical. There is still a lack of sufficient research on how horticultural therapy can provide practical guidance for the construction of hospital outdoor environments. Currently, most hospitals, apart from specifically hiring designers for therapeutic landscape design, focus mainly on ornamental and aesthetic aspects in their plant configurations, without fully utilizing and implementing therapeutic landscape. For many hospitals with a long history, redesigning can be time-consuming and labor-intensive. However, if we can base the transformation and design of different areas within these hospital green spaces on their distinctive features, and propose professional plant planting recommendations and models based on horticultural therapy, it would greatly benefit these hospitals in terms of reference and learning. In this process, horticultural therapy can transition from theoretical research to practical application, becoming a healthy, natural, environmentally friendly, distinctive, and effective means of rehabilitation in assisting medical development (Gonzalez & Kirkevold, 2014).

(2) Social level

Hospital construction is an essential component of the smooth functioning of society, particularly in the current stage where the aging population is increasing. If hospitals can incorporate the design and application of horticultural therapy, creating outdoor spaces with plant landscapes that provide a sense of comfort, it not only holds reference value for other types of hospitals but also has important implications for surrounding industries such as nursing homes, rehabilitation centers, and even end-of-life care facilities. Additionally, it can enhance the understanding of horticultural therapy among healthcare professionals, patients, and their families, while promoting environmental awareness and health consciousness among the general public.

(3) Hospital level

As society continues to progress and develop, with the increasing mention of "people-oriented" and "humanized environment," the development of hospitals should no longer solely focus on the advancement of medical technology but also pay attention to the

improvement of the overall hospital environment. Many successful cases have demonstrated that a "good" hospital cannot exist without a comfortable outdoor environment. The essence of hospital environmental construction fundamentally forms part of the level of medical care. The construction of a good hospital environment can help patients relax both physically and mentally, promoting their recovery. People's considerations regarding hospitals are gradually shifting towards the experience of the environment. To gain an advantage in fierce competition, hospitals need to not only increase investment in new technologies and equipment and improve their operational models but also attach sufficient importance to enhancing the quality of the hospital environment. Enhancing the outdoor landscape environment of hospitals can not only increase their value and competitiveness in the industry but also establish a positive image for the hospital and increase the trust patients have in the hospital (Paraskevopoulou & Kamperi, 2018).

(4) Personal level

From an individual perspective, the outdoor spaces of hospitals are closely related to the usage experience of hospital staff and patient populations. Through the design of horticultural therapy, it is possible to provide a better outdoor environment for different user groups. A well-designed plant landscape in the outdoor spaces of hospitals creates a visually pleasing effect, benefits patients' recovery, enhances the efficiency of medical professionals, and brings joy to patients' families. On the other hand, as awareness of landscapes based on horticultural therapy increases among healthcare professionals, it contributes to a better understanding of patients' needs and psychological states (Lu et al., 2021).

In conclusion, research on plant landscapes in the outdoor spaces of hospitals plays an important and practical role in improving the overall environmental quality of comprehensive hospitals.

2 THEORETICAL RESEARCH

2.1 Related Concepts

2.1.1 Horticultural therapy and Therapeutic Landscape

The concept of therapeutic landscapes originated in the United States. According to the academic terminology used by the American scholarly community, it should be referred to as "Therapeutic Landscape." Allison Williams mentioned in her book "Therapeutic Landscape: The Dynamic Between Place and Wellness" that therapeutic landscapes are a type of landscape associated with treatment and rehabilitation. Specifically, they are spaces composed of material, psychological, and social environments related to treatment and rehabilitation, which provide supportive effects on the body, mind, and even the soul (Williams, 1999).

Currently, the internationally recognized definition of horticultural therapy is proposed by the American Horticultural Therapy Association (2019). It states that horticultural therapy is an effective method that utilizes plant cultivation and gardening activities to make adjustments and improvements in the social, educational, psychological, and physical aspects of individuals who require such improvements in their bodies and minds. Horticultural therapy is a global, adaptable field that can be scientifically researched and explored.

2.1.2 Subjects of horticultural therapy

Horticultural therapy targets not only occupational diseases, elderly individuals, psychiatric patients, and people with disabilities but also has beneficial health effects on healthy and sub-healthy populations. Therapeutic landscape takes various forms and encompasses not only outdoor environments of medical institutions but also sanatoriums, nursing homes, rehabilitation centers, as well as communities and parks. In summary, the key to the success of therapeutic landscape lies in creating a landscape environment that positively and beneficially impacts the physiological and psychological well-being of various user groups.

From the above, it can be seen that therapeutic landscapes, as a type of landscape that promotes recovery, differ from general landscapes. Therapeutic landscapes prioritize health and serve special populations, placing the promotion of health as a priority. Therefore, therapeutic landscapes possess the characteristics of promoting the recovery of patients, individuals with psychological disorders, and those in special stages of health.

2.1.3 Impact of horticultural therapy

Horticultural therapy treatment can have multiple positive effects on a person's mental well-being. Firstly, it helps alleviate feelings of anxiety and restlessness. Research indicates that strolling through gardens or gazing at plants through windows can to some extent soothe feelings of anxiety and facilitate the recovery of patients. Engaging in gardening activities and similar tasks has an even better effect on stabilizing emotions (Ulrich, 1984). Secondly, it increases physical activity. For patients experiencing high levels of mental stress, focusing on gardening activities can help redirect negative emotions, thereby promoting better sleep and increasing physical vitality (Ulrich et al., 1991). Thirdly, it stimulates brain activity. Colored plants can stimulate the brain and make it more active. For example, blue can create a sense of elegance and tranquility, white can evoke feelings of purity and cleanliness, and orange can provide a sense of brightness, warmth, and joy (Fang Jialin, 2021). Floral arrangements and creations during gardening activities can also stimulate imagination and manual dexterity, thus promoting brain activity. Fourthly, it enhances a sense of responsibility and self-confidence. Assigning individuals the task of managing plants and clearly defining their responsibilities helps cultivate a sense of responsibility in patients. On the other hand, when patients see the fruits of their efforts in successfully managing plants, it boosts their self-confidence. In addition to the psychological benefits, horticultural therapy also improves social skills. Participants in horticultural therapy have common topics of interest, which promotes communication and enhances social abilities.

2.1.4 Components of horticultural therapy

(1) Visual — colour therapy

Visual elements are the primary consideration for patients engaging in therapeutic horticultural activities. Color is an important factor in visual perception, as it not only provides a pleasing aesthetic experience but also stimulates the neural pathways in the observer's brain, leading to associated thoughts and subsequent emotional changes, thus eliciting different psychological responses. From psychological, physiological, and ecological perspectives, greening and tree planting have effects on improving human physiological functions, enhancing excitement levels, and regulating physiological processes. Some experts refer to this effect as color therapy. There are case studies indicating that the arrangement of light and dark colors can focus patients' attention, invigorate the mind, and achieve a state of relaxation (Li et al., 2012).

(2) Smell — aroma therapy

Smell has a significant impact on people's emotions and the central nervous system as it can directly reach the brain through the olfactory nerves. Aromatherapy, for instance, utilizes different scents to alleviate stress and anxiety (Choi et al., 2022). The sense of smell provides a direct mode of perception, and aromatic plant fragrances have various effects, such as regulating the human nervous system, promoting blood circulation, and possessing special abilities like antimicrobial, insect-repellent, sterilizing, and air-purifying properties. In the context of horticultural therapy, it is important to incorporate volatile essential oils and aromatic plants with the aim of achieving safe, reliable, and non-side-effect healthcare benefits. There is a wide variety of aromatic plant species, including lavender, clove, and osmanthus, which have antibacterial and anti-inflammatory properties; peppermint and geranium, which have calming and soothing effects; and jasmine, which has antipyretic and analgesic properties. In addition to their disease prevention and treatment benefits, aromatic plants also have air purification, mosquito repellent, and fly control effects.

(3) Hearing

Nowadays, many people are realizing the therapeutic effects of sound and incorporating it into the process of treatment and healthcare, yielding positive therapeutic outcomes (Latif & IEEE, 2018). Sound therapy is a vibrant treatment modality. Different plants produce distinct sounds in response to external stimuli. For example, the rustling of branches and leaves when wind blows, the sound of falling leaves carried by the wind, and the patter of raindrops on vegetation collectively create a pleasant auditory landscape. Different sounds bring different stimuli, thereby alleviating various symptoms. Therefore, in the context of horticultural therapy, it is important to create a relaxing natural sound environment as much as possible. Additionally, outdoor sound systems can be introduced in horticultural therapy to play music at appropriate times, allowing patients to experience the therapeutic effects of music and achieve relaxation of body and mind, as well as restoration and healthcare goals.

(4) Touch

The skin is the sensory organ responsible for touch perception. Through touch or contact with objects, humans can sense the surrounding environment. Different environments elicit different tactile sensations, which, when transmitted to the brain, manifest as various tactile emotions, such as pleasure, anger, sadness, and fear. Similar to vision, touch helps individuals form impressions and subjective experiences of objects and the environment. Therefore, the role of touch is particularly advantageous for individuals with visual impairments as it can compensate for visual deficits and help them perceive the external environment and information. Different materials, textures, and tactile qualities directly contribute to the tactile experience of objects. In the context of horticultural therapy, in addition to fulfilling functional and aesthetic aspects, consideration should be given to the tactile sensations elicited by the texture of plants.

(5) Taste

Taste is one of the sensory perceptions of humans, referring to the individual's ability to discern the flavors of objects. The receptors for taste are mainly located on the tongue.

The basic taste sensations are sour, sweet, bitter, and salty, and people's perception of taste can evoke different emotions. Among them, people are most sensitive to bitterness, and the perception of bitterness is often unpleasant and unacceptable. Conversely, the taste of sweetness produces a pleasant sensation. The influence and effects of taste on individuals can be combined with horticultural therapy, specifically by cultivating green fruits and vegetables that can be harvested and tasted.

2.2 Research Development and Current Status of Horticultural Therapy

Horticultural therapy has gone through four stages of development: the embryonic period influenced by various civilizations such as Japanese Zen gardens, classical Chinese private gardens, and Greek sleep gardens; the rudimentary stage influenced by medieval European monastery gardens; the period of neglect when garden functions were undervalued after the Renaissance with a focus on architectural functionality; and the stage of development coinciding with the emergence of rehabilitation medicine. Over time, rehabilitation gardens have gradually evolved towards professionalization (Zhang Lian, 2019). Currently, the definition of therapeutic landscape is a nature or man-made landscape that is accessible to various user groups and actively or passively alleviates users' stress, improves their physical, psychological, or mental conditions, and helps them regain their health.

The theoretical research on Horticultural therapy started earlier in the United States and European countries, with the development of the concept of "healing gardens". Horticultural therapy originated in the 19th century in the United Kingdom and gradually gained popularity in the 20th century in Europe, the United States, Japan, and other countries. The United States was the first country to establish a horticultural therapy association. Subsequently, organizations and institutions related to horticultural therapy emerged in Japan, Canada, the United Kingdom, China, and other countries. These countries have conducted profound research on the theory of rehabilitation landscapes, landscape design, and plant functionality, gradually advancing the professional development of horticultural therapy (Zhang Lian, 2019). Countries such as the United Kingdom, the United States, and South Korea place greater emphasis on training

professionals in horticultural therapy, with some establishing training institutions and offering relevant courses on campuses. Thus, it can be seen that research on horticultural therapy in the Americas and European countries is relatively mature in both theory and practice. They have accumulated abundant experiences and hold a leading position, providing valuable references for the development of horticultural therapy in other countries.

2.2.1 Horticultural therapy research developments in European

During ancient Egypt, people were aware of the significance of agricultural activities and other manual labor on their physical and mental well-being. The earliest discovered therapeutic garden was the Asclepieion temple complex in Epidaurus, ancient Greece, dating from the 4th century BCE to the 6th century CE, where patients underwent sleep therapy. Treatment methods included hydrotherapy, fresh air therapy, sunbathing, topical ointments, exercise, and dietary interventions. On one hand, the comfortable environment facilitated physical recovery, while on the other hand, the natural and psychological aspects stimulated the patients' self-healing abilities (Yuan Xin, 2016).

In the 3rd century CE, the Romans established recuperation centers for injured soldiers in strategic locations. These centers not only provided basic ward facilities but also incorporated rehabilitation departments. Through the utilization of natural lighting, ventilation, and isolation of wards, the recovery of patients was promoted.

Around the 5th century CE, the concept of therapeutic landscapes, which emphasized the relationship between humans and nature, emerged in the Western world. Hippocrates, recognized as the father of Western medicine, discussed the impact of natural environments (such as the direction of cities, soil, water sources, habits, and lifestyle) on human health in his medical work "On Airs, Waters, and Places" (Pringuey-Criou, 2015).

During the medieval period in Europe, society was predominantly Christian. Patients, driven by their religious beliefs, sought solace and healing through prayers at temples after falling ill. Monasteries became significant healthcare institutions, and believers often treated patients in arched courtyards. These temples would incorporate gardens and other outdoor spaces to facilitate patients' recovery. Cloistered courtyards were among the earliest outdoor areas provided for contemplation and meditation.

In the 14th to 15th centuries, a series of plagues, crop failures, rapid migration, and the trend of urbanization led to the decline of monasteries, and the gardens for cultivating medicinal herbs disappeared along with them. As capitalism quietly emerged, the monastic system fell out of favor, and the presence of hospitals gradually faded from churches, along with the disappearance of the accompanying courtyards (Ban Qianwei, 2018).

Horticultural therapy emerged in the 17th to 18th centuries, as the consequences of infectious diseases made people aware of the importance of environmental hygiene. It was initially started by the upper class in England, who transformed their own estates and created structures with outdoor landscapes resembling hospitals.

In the late 18th to early 19th centuries, Europe underwent significant reforms in the treatment of mental illnesses. Most mental patients in Europe were subjected to physical treatments, but through continuous research, psychological therapy gradually replaced physical treatments. Medical institutions began to use environmental therapy instead of physical treatments. For example, surrounding landscapes were filled with plants to ensure patient privacy while also addressing the curiosity of onlookers, thereby providing a therapeutic experience while creating beautiful landscapes. From then on, courtyard landscape design gradually became an integral part of medical institutions (Zhang Lian, 2019).

However, until the mid-19th century, hospitals still defined themselves as asylums, and their main purpose was not rehabilitation treatment, as hospitals at this time did not have comprehensive medical techniques and nursing methods as they do today.

After the mid-19th century, hospitals underwent significant development, attributed to three main factors: the emergence of the germ theory, the reform efforts of Florence Nightingale (founder of the nursing profession and pioneer of modern nursing education), and the practical opportunities presented by World War II. These developments led to a comprehensive transformation of hospitals, where patients became the primary focus of meticulous care and treatment. Hospitals began to be seen as places for both the injured and the ill to recover.

During the 19th and 20th centuries, the outbreak of two world wars not only brought suffering to the people but also led to a sharp increase in wounded soldiers, putting

immense pressure on the healthcare environment. As a result, medical facilities had to abandon their previous emphasis on aesthetically pleasing environments, spacious courtyards, and sunlight in order to accommodate a larger number of patients.

In the early 20th century, horticultural therapy started to develop. Following the First World War, the concept of gardens was introduced into the interiors of rehabilitation hospitals, and after the Second World War, horticultural therapy activities began to be incorporated into gardens, providing opportunities for retired soldiers, the elderly, and individuals with mental health issues (Ban Qianwei, 2018).

In 1978, the Horticultural Therapy and Tural Training Association (HT) was established in the United Kingdom as the only professional organization of its kind in Europe. The association caters to individuals of all ages and various conditions, offering guidance on learning horticultural therapy, managing gardens, cultivation techniques, welfare facilities, and publishing horticultural therapy-related publications. The UK also places great emphasis on training professionals in horticultural therapy. The UK Horticultural Therapy Association functions as a training institution in partnership with the Faculty of Health and Social Sciences at Coventry College, offering a "Certificate in Therapeutic Horticulture." Additionally, individuals can obtain relevant certification by actively participating in the lecture series on "Horticulture as Therapy" offered by the Horticultural College at the University of Reading (Xi, 2014).

The concept of therapeutic landscapes was formally introduced by Gesler in 1992. He defined therapeutic landscapes as environments, facilities, landscapes, spaces that promote human recovery and overall physical and mental well-being (Gesler, 1992).These landscapes, whether natural or man-made, serve the same purpose. Since the 1980s, evidence-based design has gained prominence in European healthcare construction, emphasizing the use of scientific research methods and statistical data to validate the impact of the environment on health.

In the 21st century, research on therapeutic landscapes in Europe has become more profound and comprehensive. With increasing attention to therapeutic landscapes, there have been numerous successful practice cases, and the theoretical and research foundations have gradually improved and formed a systematic approach.

2.2.2 Horticultural therapy research developments in the United States

The birthplace of horticultural therapy is in the United States, where dedicated positions and qualifications for horticultural therapy have been established. Universities offer specialized disciplines in horticultural therapy, and therapeutic gardens of various types are found throughout the country. Continuous horticultural activities and therapy courses ensure the enduring popularity of this practice.

Since the 18th century, the United States has been employing agricultural cultivation and horticultural practices as therapeutic methods for individuals with mental illnesses, contributing to the development of horticultural therapy. In the early 19th century, Benjamin Rush, a medical professor in Philadelphia, officially integrated horticulture into professional clinical treatment, opening a door to the outdoors for patients with psychological disorders (Rush, 1812).

At the beginning of the 20th century, after the Second World War, returning soldiers faced psychological trauma that made it difficult for them to resume their previous lives. As a result, military hospitals experimented with horticultural therapy, yielding positive results (Poulsen et al., 2015).

In 1953, the Massachusetts Forest Botanical Garden began offering horticultural therapy services. In 1973, the Horticultural Therapy and Rehabilitation National Committee (renamed the American Horticultural Therapy Association, AHTA, in 1987) was established in the United States. This association is dedicated to the development of horticultural therapy and rehabilitation activities and publishes the Journal of Therapeutic Horticulture. The United States also places great emphasis on the training of horticultural therapy professionals. In 1977, the Chicago Botanic Garden started offering horticultural therapy courses, aimed at training professionals for facilities such as sanatoriums, vocational training centers for individuals with intellectual disabilities, elderly specialized residences, mental hospitals, vocational schools for youth, and veterans' hospitals. Currently, there are over 300 botanical gardens and arboretums across the United States that provide horticultural therapy services (*Chicago Botanic Garden*, 1977).

In 1987, the Canadian Horticultural Therapy Association (CHTA) was established in

Canada. Similar to the United States, Canada also places great importance on horticultural therapy research and has notable practical examples, such as the Guelph Rehabilitation Garden and the Tennyson Farm Therapeutic Community, which offer a range of horticultural activities for individuals with physical and mental disabilities, producing positive effects on their physical, psychological, and spiritual well-being (Canadian Horticultural Therapy Association, 1987).

In the mid to late 20th century, the development of medical technology and pharmaceutical science led to the neglect of the therapeutic effects of hospital gardens. In the 1980s, Roger Ulrich conducted observations and evaluations on post-cholecystectomy patients in different rehabilitation environments, providing the first scientific evidence that landscapes can aid in patients' recovery. This experiment propelled the development of therapeutic gardens. In 1983, Ulrich proposed the Stress Recovery Theory, suggesting that rehabilitative elements such as plants and water can improve negative emotions and physiological responses caused by stress. Based on this theory, he conducted further research, believing that natural environments can influence people's health by altering physiological characteristics such as skin conductance. Ulrich named this theory the "Biophilia Hypothesis," which was accepted by numerous scholars and served as the foundation for the construction of various practical examples (Ulrich, 1983).

In 1995, the Kaplans introduced the Attention Restoration Theory. They posited that when individuals engage in tasks requiring intense concentration, fatigue often ensues. However, engaging in tasks such as appreciating natural environments that do not demand high levels of attention can alleviate stress, improve mood, and facilitate recovery. The Kaplans defined four characteristics encompassing the Attention Restoration Theory: being away, extent, fascination, and compatibility. The combined effect of these four elements maximizes the restoration process. Environments that incorporate these four traits can be referred to as "restorative environments"(Kaplan & Kaplan, 1989).

In 1998, Martha M. Tyson published the book "The Healing Landscape: Therapeutic Outdoor Environments", emphasizing that outdoor rehabilitative landscapes should first understand people's needs and preferences, establish rehabilitation goals and plans accordingly, and establish a comprehensive and scientific evaluation system to lay the

foundation for the development of therapeutic gardens (Tyson, 1998).

Healing gardens: Therapeutic Benefits and Design Recommendations, co-authored by Clare Cooper Marcus and Marni Barnes (1999), It begins by exploring current research revealing the links between nature, human stress reduction and medical outcomes. Then presents case studies and design guidelines for outdoor spaces in healthcare settings. Each type of outdoor space covered includes historical information, literature reviews and usage studies that provide important insights into what works and what doesn't in therapeutic gardens. Healing gardens: Theory and Practice, co-authored by Clare Cooper Marcus and Marnie Barnes, put rehabilitative gardens on the map by focusing on field research, observing hundreds of hospitals, and analyzing and summarizing the design principles and design points for various types of healing gardens (Marcus & Barnes, 2007).

In 2003, the American Society of Landscape Architects (ASLA) established the Healthcare and Therapeutic Design Professional Practice Network, providing a platform for researchers to exchange knowledge. To enhance communication among professionals in various fields, the "Therapeutic Landscape Database" was created (Therapeutic Landscapes Network, 1999).

At the beginning of the 21st century, the Chicago Botanic Garden pioneered the creation of a graduate course in "Rehabilitation Garden Design" to cultivate landscape architects specializing in this field. In addition to the specific research on rehabilitative gardens in healthcare environments, there is also a promotion of sensory gardens in residential gardens that are beneficial to physical and mental well-being, including horticultural therapy gardens, children's playgrounds, fruit and vegetable gardens, and contemplative gardens (Chicago Botanic Garden, 1977).

In summary, the United States has conducted in-depth research in various aspects of rehabilitative landscape theory and practice, and it serves as a representative in this field. Particularly in terms of practice, there are numerous successful cases of rehabilitation garden construction in the United States that genuinely consider the perspectives of users, encompassing aspects ranging from overall landscape planning and design to plant selection, garden path design, material usage, and the design of horticultural facilities and spaces.

3 RESEARCH OVERVIEW

3.1 Research Content

This research is based on the concept of horticultural therapy in the general hospital. The results of the research are analyzed and discussed to summarise the problems of existing plant application and to propose optimisation strategies. The main contents include the following aspects:

(1) The literature review examines theories relevant to horticultural therapy, provides a summary of horticultural therapy and its associated concepts, and presents an overview of the development status of horticultural therapy in various countries. Building upon this foundation, the research objectives are formulated, the research's significance is elucidated, and the overall ideas and research methods of the study are determined.

(2) Based on a site survey conducted on the actual conditions of three major general hospitals in Budapest, this study aims to analyze the plant species, quantity characteristics of plant communities, characteristics of plant arrangement, seasonal colors, as well as the utilization of native species and plants related to five feelings in the outdoor spaces of these hospitals. By summarizing the issues present in the outdoor environments of the three general hospitals, suitable and feasible design strategies are proposed based on the principles of horticultural therapy, with the objective of establishing a comprehensive design concept.

(3) Conduct research on the classification of landscape plants in Budapest specifically for horticultural therapy purposes, followed by a summary of the diverse types of landscape plants suitable for Budapest. Six sites were chosen within three hospitals, and the strategies were implemented in the actual locations.

3.2 Research Subjects

The primary research objects for the thesis will be three general hospitals in Budapest (Figure 1) that have good visibility and well-built green landscapes. The selection of the sites was based mainly on hospitals located in different districts, with different site scales,

different layouts and relatively large green spaces and a rich cultural history. General hospitals were selected for the study because they offer a broader range of services to diverse user groups, including individuals of various ages and with different medical conditions. This selection ensures greater representativeness, considering the distinct physical and psychological requirements of patients with different illnesses and varying treatment durations. Consequently, the buildings and external landscape environments of general hospitals tend to surpass those of local and smaller hospitals in terms of quality and scope.

3.2.1 Szent Imre Hospital

The Szent Imre Hospital is a separate legal entity with separate financial management. The National Public Health Centre's operating license establishes the professional operation of the hospital, its operational scope, and its duty of care. The relevant National Health Insurance Fund Management (NEAK) contract governs the hospital's mission objectives, the number of beds, and the number of hours as a contracted healthcare provider under the NEAK. It is maintained by the National Hospital Directorate (OKF) and works in accordance with SRM standards. Szent Imre Hospital is still in use as a central hospital as of January 2021. The hospital has a space of around 6.5 hectares (*Szechenyi 2020*, n.d.).

3.2.2 Jahn Ferenc South-Pest Hospital

The Jahn Ferenc South-Pest Hospital opened in 1980, provides outpatient and inpatient care to the local population. It provides medical care to nearly 500,000 people, treating over 41,000 patients a year in its 1,263 beds and has more than 660,000 outpatient visits per year. Neurological and urological care is the focus of the country's general medical care. In addition to a highly qualified team of specialists, the patients benefit from increasingly modern equipment (such as state-of-the-art CT equipment, ear lasers and many other modern instruments), comfortable wards with bathrooms, a pharmacy and an efficient quality assurance system. The hospital is located at the intersection of Virág Benedek Street and Köves Road (Jahn Ferenc South-Pest Hospital, n.d.).

3.2.3 Szent János Hospital

The Buda Children's Hospital, St. Margaret's Hospital, and St. John's Hospital were affected by Hungary's 2007 decision to consolidate three hospitals in the city. The Metropolitan City St. John's Hospital and the North Buda Joint Hospital are the new names for the former joint hospital.

The ownership of the hospitals was transferred to the Ministry of National Resources on January 1, 2012. In specifically, the Institute for the Development of Pharmacy and Healthcare Quality and Organization (GYEMSZI) is in charge of maintenance tasks, and the Hungarian National Asset Management Ltd., a division of the Ministry of National Development, is the trustee. The facility is one of the rare healthcare facilities that offers all medical specialties, with the exception of cardiac surgery. The hospital has a space of around 12 hectares. It has a lot of outside vegetation (Észak-budai Szent János Centrumkórház, n.d.).

Szent Imre Hospital

Jahn Ferenc South-Pest Hospital

Szent János Hospital

Figure 1 - Entrances of three hospitals in Budapest

Source: Google, 2023

3.3 Research Methodology

3.3.1 Data collection

(1) Literature research method

Through the selection, examination, and compilation of relevant books, articles, monographs, and other resources concerning landscapes in the context of horticultural therapy, a comprehensive understanding of the principles of landscape design in horticultural therapy is attained. This process involves gathering the necessary theoretical

groundwork to support the thesis writing, followed by the editing of literature contents based on this foundation. Additionally, it entails gaining insights into the current state of research on horticultural therapy both domestically and internationally, and integrating perspectives from various experts in the field.

(2) Field research method

Field research, commonly referred to as field survey or fieldwork, is the primary research methodology of utmost importance. In an effort to furnish evidence that addresses the existing problems concerning plant landscapes in outdoor areas of hospitals, this research conducted an investigation into the plant species, plant arrangements, and present impacts of the plant landscape in the outdoor spaces of three representative general hospitals. This inquiry was carried out through the means of observation, recording, photography, and the creation of floor plans.

(3) Questionnaire method

The questionnaire method mainly applies the data processing of qualitative indicators in the evaluation index and the verification of the rationality of the evaluation system. By investigating the experts' evaluation of the relative importance of the hospital's plant landscape indicators and people in hospitals evaluation of the hospital's outdoor plant landscape, the corresponding results are obtained and mathematical formulas are used to constitute a mathematical relationship between the values and the landscape, transforming the abstract qualitative evaluation into a tangible quantitative evaluation.

3.3.2 Landscape evaluation

(1) Analytic Hierarchy Process (AHP)

Analytic Hierarchy Process, or AHP for short, was introduced by T.L. Saaty (1988), an operations research scientist at the University of Pittsburgh in the USA. It is a combined qualitative and quantitative method of decision analysis for solving complex problems with multiple objectives. The method combines using the decision maker's experience to judge the relative importance between the criteria for each measure of goal attainment, and

reasonably gives the weights of each criterion for each decision option, using the weights to find the order of merit of each item, which is more effectively applied to those topics that are difficult to solve by quantitative methods. This method overcomes the subjective will of the evaluator and personal preference leading to bias in the evaluation results, thus making the evaluation results more scientific and objective. This method has wide application in landscape architecture.

Evaluation system framework

According to the Analytic Hierarchy Process method, the evaluation system of outdoor planting in hospitals is divided into three layers, which are the goal layer, the criteria layer and the object layer (Saaty, 2005). The critera layer is divided into three main aspects: suitability, ornamental and healing. Therefore, suitability, ornamental and healing are considered as the first level indicators of the comprehensive evaluation system, and the first level indicators are decomposed into 12 individual items. The framework of the comprehensive evaluation indicator system proposed in this research is constructed based on these indicators (Table 1).

Goal layer (a)	Criteria layer (b)	Object layer (c)
Comprehensive assessment of hospital outdoor environment	Suitability (b_1)	Reasonable spatial layout (c_1)
		Suitability of spatial scale (c_2)
		Comfort of the light environment (c_3)
		Comfort of the sound environment (c_4)
		Safety (c_5)
	Ornamental (b_2)	Plant seasonal changes (c_6)
		Plant levels of contrasts (c_7)
		Green looking ratio (c_8)
		Richness of plant ornamental features (c_9)
	Healing (b_3)	Applications of aromatic plants (c_{10})
		Applications of edible plants (c_{11})
		Applications of special tactile plants (c_{12})

Table 1 - Framework of comprehensive assessment system of hospital outdoor environment

Source: by author

Consistency testing

The consistency test mainly tests the feasibility of the Analytic Hierarchy Process method to avoid the conflict. The consistency test is needed for the judgment matrix, which requires the calculation of the characteristic roots and the characteristic vectors according to the matrix, and the calculation of Rc according to the formula: $R_C=I_C/I_R$, I_C can be calculated from the matrix, while I_R is known and can be obtained from Table 2. When the consistency ratio $R_C < 0.1$, the inconsistency of the matrix is considered to be within the tolerance range, there is satisfactory consistency and the consistency test is passed. Otherwise, it needs to be readjusted to see if the judgment matrix construction appears to be self-contradictory.

n	1	2	3	4	5	6	7	8	9	10	11
R_I	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49	1.51

Table 2 - Consistency Indicator I_R

Source: Saaty, 2008

Evaluation criteria definition

This research was first conducted by scoring each evaluation factor individually, based on literature and field surveys related to outdoor plant landscaping in hospitals (Ding Shaogang & Zhu Yanran, 2017). And also a 3-level grading standard of 15, 10 and 5, from good to poor, was used to define and describe each level (Table 3).

Items	Indicators	Evaluation criteria	Points
c_1	Reasonable spatial layout	Has open, semi-open and private spaces to meet the varied needs of users	15
		Has different spaces but is not diverse enough to meet the needs of patients	10
		Lack of diverse spaces to meet user needs	5
c_2	Suitability of spatial scale	Appropriate proportion of the landscape elements and height to width ratio of the green space to the surrounding, pleasant spatial scale	15
		Site scale is slightly empty or oppressive, slightly under-proportioned between landscape elements	10
		Site scale looks empty or depressing, with disproportionate proportions between features	5

c_3	Comfort of the light environment	Green space with shade in summer and sunshine in winter, highly comfortable	15
		Green space with insufficient shade in summer or insufficient sunlight in winter, average comfort	10
		Green space are too sunny in summer or too dark in winter, less comfortable	5
c_4	Comfort of the sound environment	Pleasant outdoor environment with the sound of water or birdsong, appropriately quiet level	15
		Outdoor environment lacks the pleasant sound of water or birdsong, generally quiet	10
		Noisy outdoor environment with poor quietness	5
c_5	Safety	Safe green space planting arrangements with little toxic and spiny plants	15
		Generally safe planting arrangements with toxic and spiny plants, but a low percentage	10
		The planting is not very safe, with a high proportion of toxic and spiny plants that need attention	5
c_6	Seasons and colours	Varied and pleasant seasonal changes and plant colours, distinctive landscape in all seasons	15
		Good seasonal changes and colour of plants, generally recognisable in the four seasons	10
		No obvious seasonal changes, single plant colour, indistinguishable landscape in different seasons	5
c_7	Plant levels of contrasts	Outdoor planting arrangements are richly layered, can create a sense of beauty	15
		Outdoor plant arrangements are generally hierarchical, general beauty	10
		Outdoor plant arrangements are single hierarchy, not very aesthetically pleasing	5
c_8	Green looking ratio	50% or more greenery in the view, good greenery coverage, high level of comfort	15
		25%-50% greenery in the view, fair greenery coverage, average comfort	10
		Less than 25% greenery in the view, low greenery coverage, poor comfort	5

c_9	Richness of plant ornamental features	Green space has appropriate proportion of evergreen and deciduous plants, and has suitable proportion of trees, shrubs and grasses, and is rich in ornamental features such as foliage, flowers, fruit, branches and trunks	15
		Reasonable proportion of evergreen and deciduous, trees and grasses, and a reasonable proportion of ornamental features such as foliage, flowers, fruit, branches and trunks	10
		Poor proportion of evergreen and deciduous, trees and grasses, and a lack of ornamental features such as leaves, flowers, fruits and branches	5
c_{10}	Applications of aromatic plants	Aromatic plants are very well present, consciously used throughout the hospital, in almost every season	15
		Aromatic plants have a small proportion, with only some seasons or plots	10
		Poor use of aromatic plants, which are almost non-existent	5
c_{11}	Applications of edible plants	Edible plants are consciously used throughout the hospital, with a rich variety of edible plants	15
		Edible plants are only concentrated in some plots, with few varieties	10
		Poor application of edible plants, almost no use	5
c_{12}	Applications of special tactile plants	Special touch plants are consciously used throughout the hospital with high accessibility	15
		Special touch plants are only concentrated in a few plots and are generally accessible	10
		Special touch plants are almost not used	5

Table 3 - Indicator evaluation criteria

Source: by author

Calculating the final score

For the determination of score for each indicator, questionnaire method is used, because the results obtained in this way are more direct and relevant. Thirty questionnaires were distributed in each of the three hospitals outdoors. The questionnaire contains questions based on the individual indicators and the evaluation criteria, and the

corresponding answer options are given. The score for each item is based on the table of criteria for evaluating the indicators. Finally, the composite score of the outdoor landscape of the three hospitals was calculated according to the formula v= $\sum_{i=0}^{n} uw$ (v is composite score; u is indicator points; w is the indicator weight; n is the number of indicators) (Ding Shaogang & Zhu Yanran, 2017).

(2) Fuzzy Comprehensive Evaluation method

The concept of fuzzy sets theory was introduced in 1965 by Professor L. A. Zadeh, an American expert in automatic control, to express the uncertainty of things (Zadeh, 1965). The fuzzy integrated evaluation method is a comprehensive evaluation method based on fuzzy mathematics. It is based on the theory of affiliation in fuzzy mathematics, which transforms qualitative evaluation into quantitative evaluation. It uses fuzzy mathematics to make an overall evaluation of a thing or object that is subject to multiple factors. It has the characteristics of clear and systematic results, can better solve fuzzy and difficult to quantify problems, and is suitable for various non-deterministic problems.

This research takes the outdoor plant landscape of the hospital as the research object, and uses the Analytic Hierarchy Process method to analyse and evaluate the comprehensive quality of its outdoor plant landscape. Firstly, the composite score (v) is derived from last step, and then the Fuzzy Comprehensive Evaluation method is used to find out the rank affiliation degree (M) of its comprehensive quality. M = outdoor plant landscape composite quality index / outdoor plant landscape ideal composite quality index x 100%. The M value is used as the basic basis for the grading of the outdoor environment, and is classified into four levels, including I, II, III and IV, according to the difference percentage grading method, with the corresponding M values of 100~80, 79~60, 59~40 and 39~0 respectively (Ding Shaogang & Zhu Yanran, 2017).

4 RESULTS AND ANALYSIS

4.1 Green Space and Planting Form

4.1.1 Szent Imre Hospital

Based on field research, the existing planting patterns in the hospital were photographed and analyzed. The existing planting patterns at Szent Imre Hospital are mainly Tree + Shrub + Grass (T+S+G), Shrub + Grass (S+G), Tree + Grass (T+G), Grass (G), Shrub (S) and Herbaceous (Figure 2).

Figure 2 - Current planting form in Szent Imre Hospital

Source: by author

The Szent Imre Hospital Tree + Shrub + Grass planting pattern has the largest area, with 16.94%; Tree + Grass planting pattern is in second place, with 15.42%; Grass planting pattern is in third place, with 2.75%, much lower than the first two patterns, with a very low percentage of solitary trees and shrubs. The building area is 40%, the green area is 37% and the paved area is 23%.

Overall, Szent Imre Hospital has a comparable proportion of green space to buildings, more than paved areas. Higher proportion of T+S+G and T+G planting forms than others, and fewer individual tree and shrub plantings (Figure 3 and 4).

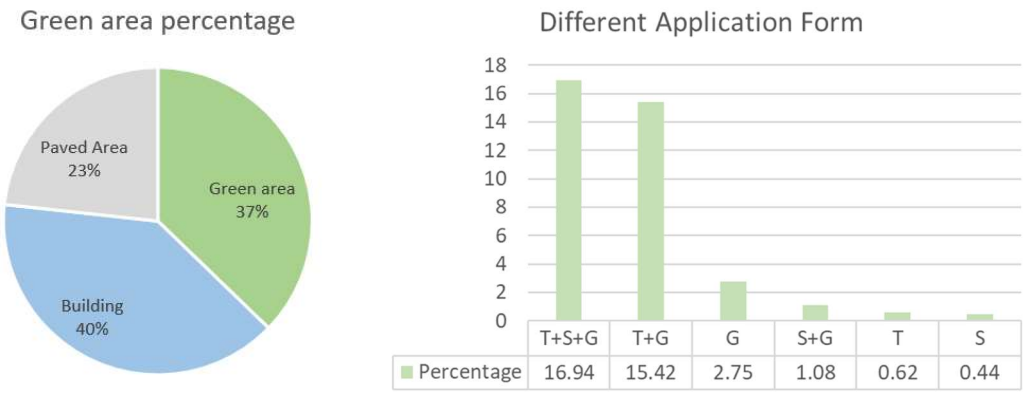

Figure 3 - Green area percentage and different application forms in Szent Imre Hospital

Source: by author

Figure 4 - Szent Imre Hospital green area map

Source: by author

4.1.2 Jahn Ferenc South-Pest Hospital

Based on field research, the existing planting patterns in the hospital were photographed and analyzed. The existing planting patterns at Jahn Ferenc South-Pest Hospital are mainly Tree + Shrub + Grass, Tree + Grass, Shrub + Grass, Grass (Figure 5).

Figure 5 - Current planting form in Jahn Ferenc South-Pest Hospital

Source: by author

Jahn Ferenc South-Pest Hospital Tree + Shrub + Grass planting pattern has the largest area, with 33.06%, much higher than the other planting patterns; Tree + Grass planting pattern is in second place with 14.49%; Grass, shrubs and grass have a low perccentage. The proportion of built-up area is 16%, the proportion of green area is 56% and the proportion of paved area is 28%.

Overall, more than half of the Jahn Ferenc South-Pest Hospital is green space, the largest of the three hospitals. T+S+G have a higher proportion of planting forms than others, less shrubs (Figure 6 and 7).

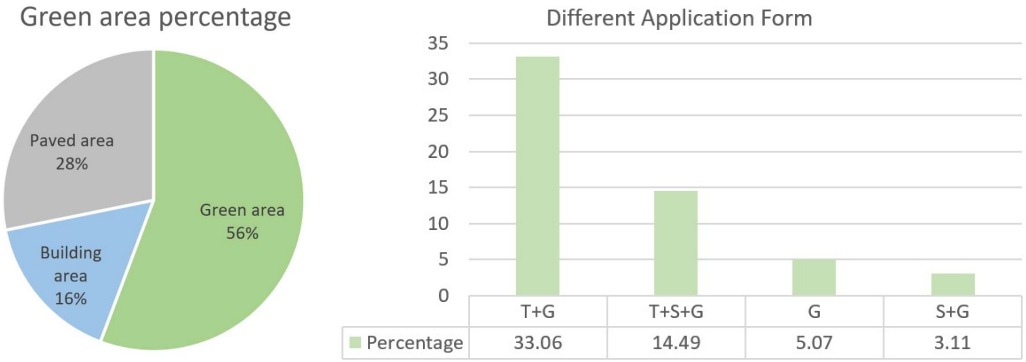

Figure 6 - Green area percentage and different application forms in Jahn Ferenc South-Pest Hospital

Source: by author

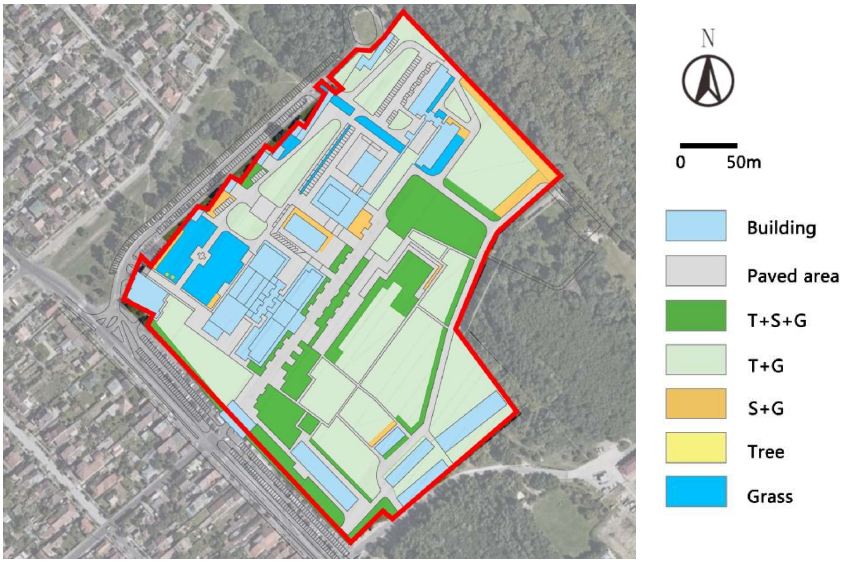

Figure 7 - Jahn Ferenc South-Pest Hospital green area map

Source: by author

4.1.3 Szent János Hospital

Based on field research, the existing planting patterns in the hospital were photographed and analyzed. The existing planting patterns at Szent János Hospital are mainly Tree + Shrub + Grass, Tree + Grass, Shrub + Grass, Shrub，Grass，Tree (T) (Figure 8).

Figure 8 - Current planting form in Szent János Hospital

Source: by author

Szent János Hospital Tree + Shrub + Grass planting pattern has the largest area, accounting for 26.59% of the hospital; it accounts for about three quarters of the green space, which shows that the majority of the planted landscape in the hospital focuses on the combination of trees, shrubs and grasses. The Tree + Grass planting pattern is in second place with 3.91%. The Grass planting pattern is in third place, with 2.22%, and the proportion of solitary trees and shrubs is very low. The building area is 29%, the green area is 35% and the paved area is 36%.

Overall, Szent János Hospital green space, building and paved areas are almost equally divided. Much higher proportion of T+S+G plants than other planting forms, with a smaller proportion of individual trees and shrubs (Figure 9 and 10).

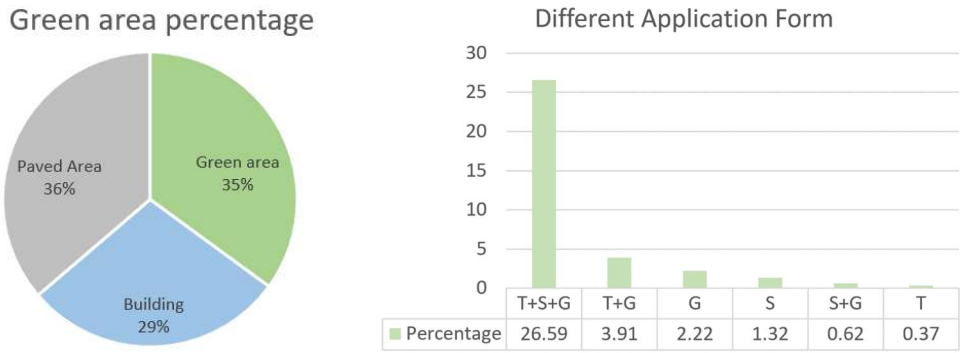

Figure 9 - Green area percentage and different application forms in Szent János Hospital

Source: by author

Figure 10 - Szent János Hospital green area map

Source: by author

4.2 Plant Application Analysis

4.2.1 Overall analysis

For three the hospitals, the most used species is *Acer platanoides*, followed by *Tilia cordata*. The most used genus is *Acer*, followed by *Fraxinus*, *Populus* (Figure 11).

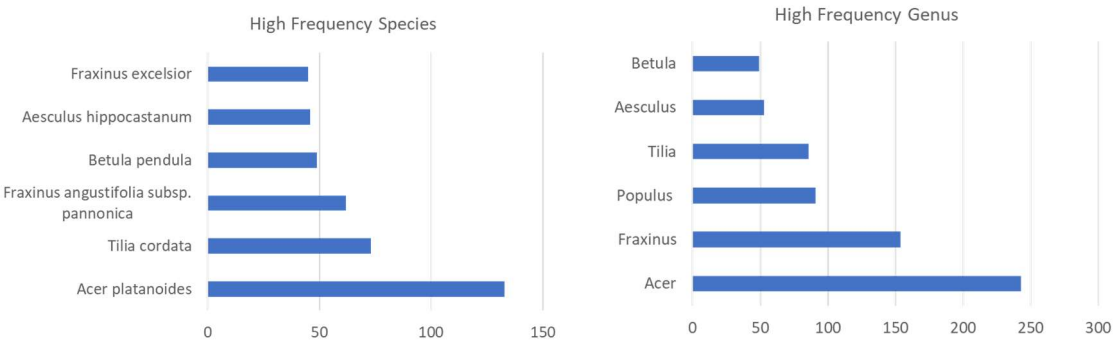

Figure 11 - High frequency species and genus in Budapest hospitals

Source: by author

Szent Imre Hospital and Jahn Ferenc South-Pest Hospital have more than half of the natives species, while Szent János Hospital is less than half, but still a large proportion. All three hospitals do not have a very high percentage of invasive species, less than 10 percent.

Szent János Hospital and Jahn Ferenc South-Pest Hospital have low percentage of spiny plants. Szent Imre Hospital has almost 20 percentage of spiny plants. For the plants have branch spines: *Crataegus monogyna*; *Craetegus laevigata* 'Pauls Scarlet'.

Three hospitals contain less than 15 percent toxic plants and less than 10 percent highly and moderately toxic plants. Szent Imre Hospital contains more poisonous plants than the other two hospitals. Toxic plants include: *Corylus colurna* (low toxic); *Quercus cerris* (low toxic); *Aesculus* × *carnea* (medium toxic); *Ligustrum vulgare* (medium toxic); *Robinia pseudoacacia* (high toxic); *Taxus baccata* (high toxic).

All three hospitals have a relatively high proportion of allergic plants, all close to 50 percent, and in particular the highest proportion of moderately allergic plants, with Szent Imre Hospital having almost 40 percent of moderately allergic plants, which is a very high level. For the plants have allergenic: *Koelreuteria paniculata* (no allergenic); *Acer platanoides* (low allergenic); *Tilia cordata* (moderately allergenic); *Betula pendula* (highly allergenic) (Figure 12).

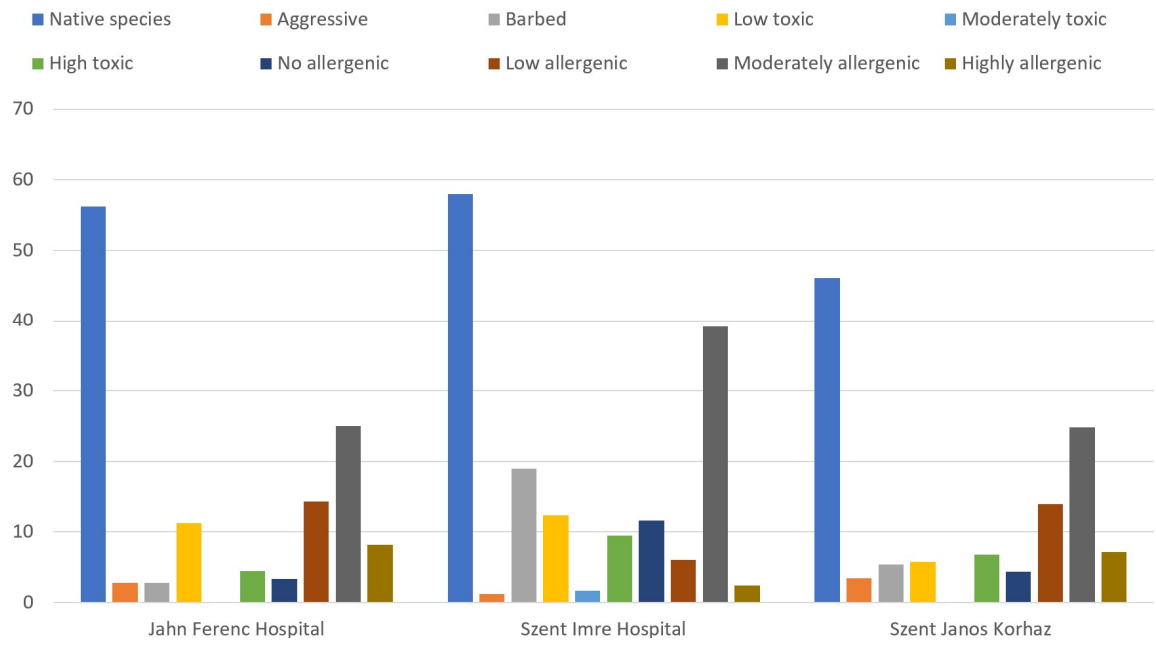

Figure 12 - Overall plants analysis of three hospitals

Source: by author

4.2.2 Visual

(1) Flower colour

Flowering period for the three hospital plants is mostly in spring and summer, with almost no flowering in autumn and winter (Figure 13).

Most of the flower colours are concentrated in white (e.g. *Prunus cerasifera; Pyrus pyraster*), yellow (*e.g. Koelreuteria paniculata*) and red (*e.g. Aesculus* × *carnea*), with a low proportion of other colours such as purple (*e.g. Lycium barbarum*).

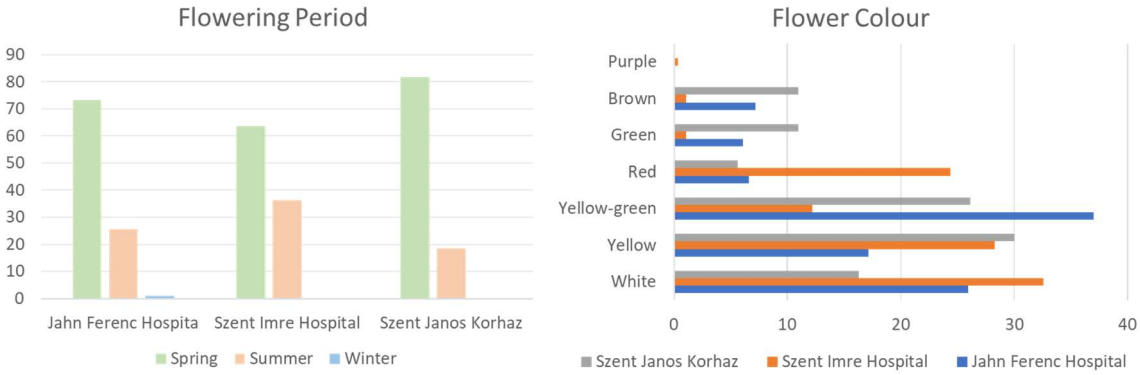

Figure 13 - Analysis of the flowering period and colours in three hospitals

Source: by author

(2) Fruits colour

The fruiting period is mostly concentrated in autumn, with a similar proportion in summer and winter, and the lowest proportion spring (Figure 14).

Fruit colour mostly brown when mature, mostly green when not mature, with a few reds (e.g. *Prunus avium*) and purples (*Celtis occidentalis*), other colours almost none.

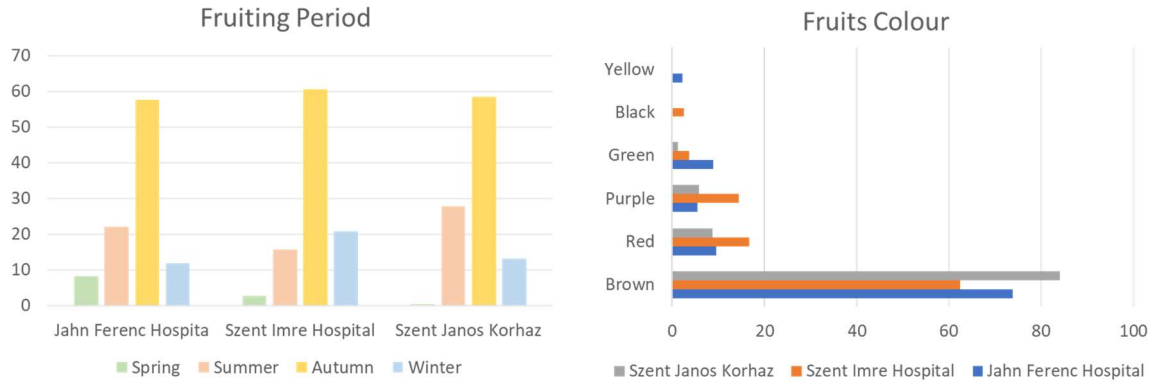

Figure 14 - Analysis of the fruiting period and colours in three hospitals

Source: by author

(3) Leaf colour

Leaf colour mostly are green and with a small proportion of purple (e.g. *Prunus cerasifera* 'Atropurpurea'). The autumn leaves is more rich in colour, but mostly yellow, followed by the green of the evergreens, with a very small proportion of reds (e.g. *Sorbus aria*) and purples. In winter with only evergreens and no other colourful foliage species (Figure 15).

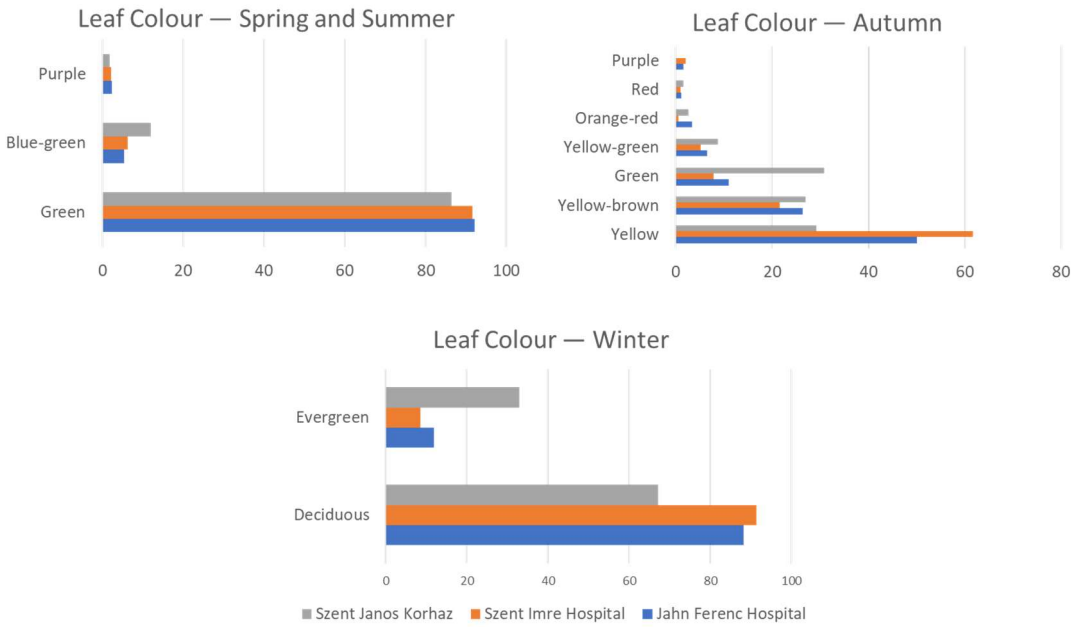

Figure 15 - Leaf colour analysis in three hospitals

Source: by author

4.2.3 Smell

The proportion of aromatic plants is around 20 percentage. Mostly derived from flowery fragrance. So mostly are seasonal Fragrant (Figure 16). For example: *Tilia platyphyllos*; *Prunus cerasifera* 'Atropurpurea'; *Elaeagnus angustifolia*; *Prunus cerasifera*; *Sophora japonica* 'Pendula'.

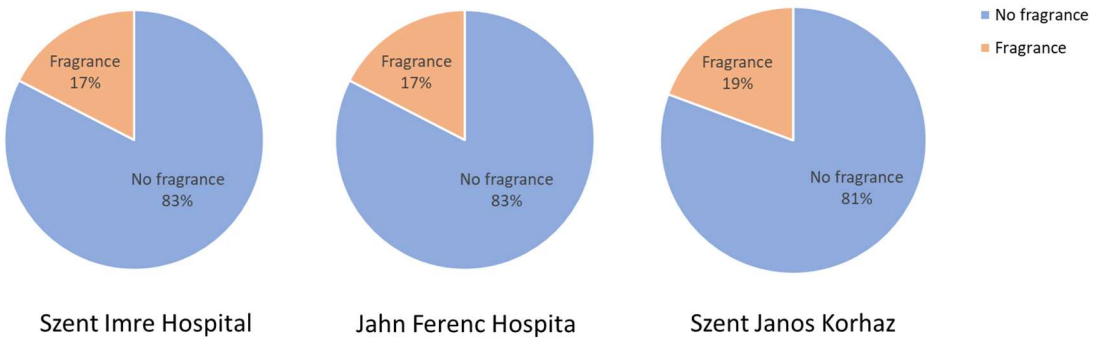

Figure 16 - Percentage of fragrant plants in three hospitals

Source: by author

The aromatic period is mainly in summer, followed by spring. Jahn Ferenc South-Pest Hospital with no autumn or winter aromatic plants. Szent Imre Hospital have very few autumn aromatic plants and no winter aromatic plants (Figure 17).

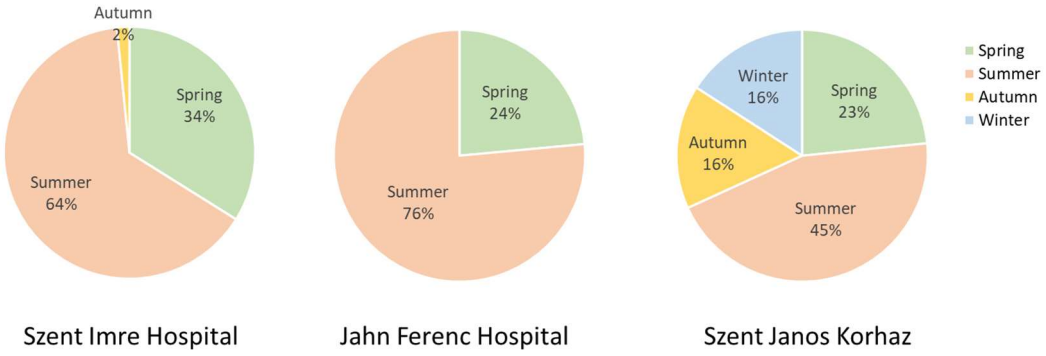

Figure 17 - Fragrant period in three hospitals

Source: by author

4.2.4 Taste

In the Budapest three hospitals, almost 80 percent of plants are inedible. About 10 percent of fruit edible. A small proportion of plant leaves and flowers are edible (Figure 18). For the edible plant in the hospitals: *Prunus avium*; *Cydonia oblonga*; *Prunus serotina*; *Pyrus pyraster*; *Craetegus laevigata* 'Pauls Scarlet'.

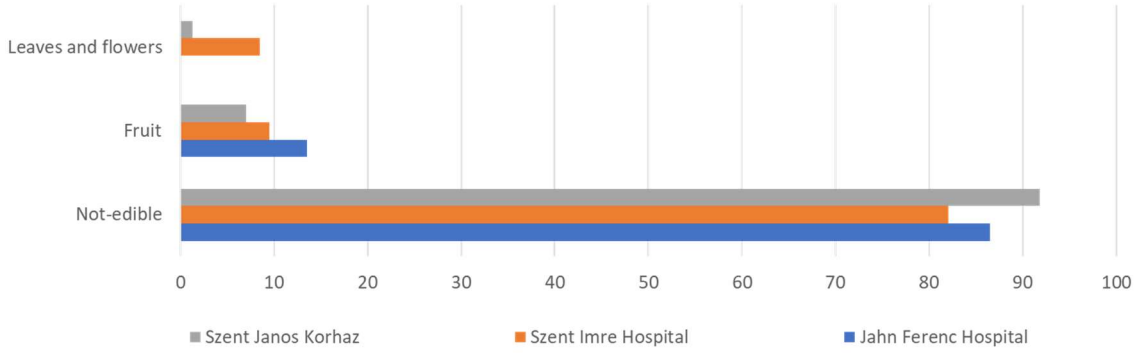

Figure 18 - Edible plants percentage in three hospitals

Source: by author

4.2.5 Touch

Leaf margins mostly serrate. Entire, biserrate, lobed leaves with a small proportion. Most plants in the three hospitals have hairless leaves. The patient contact experience can be enhanced by planting special touch plants such as *Stachys byzantina*.

Leaves mostly leathery and papery, few other touch leaves. Bark mostly longitudinal fissure and lamellar fissure, with less smooth and horizontal lines (Figure 19).

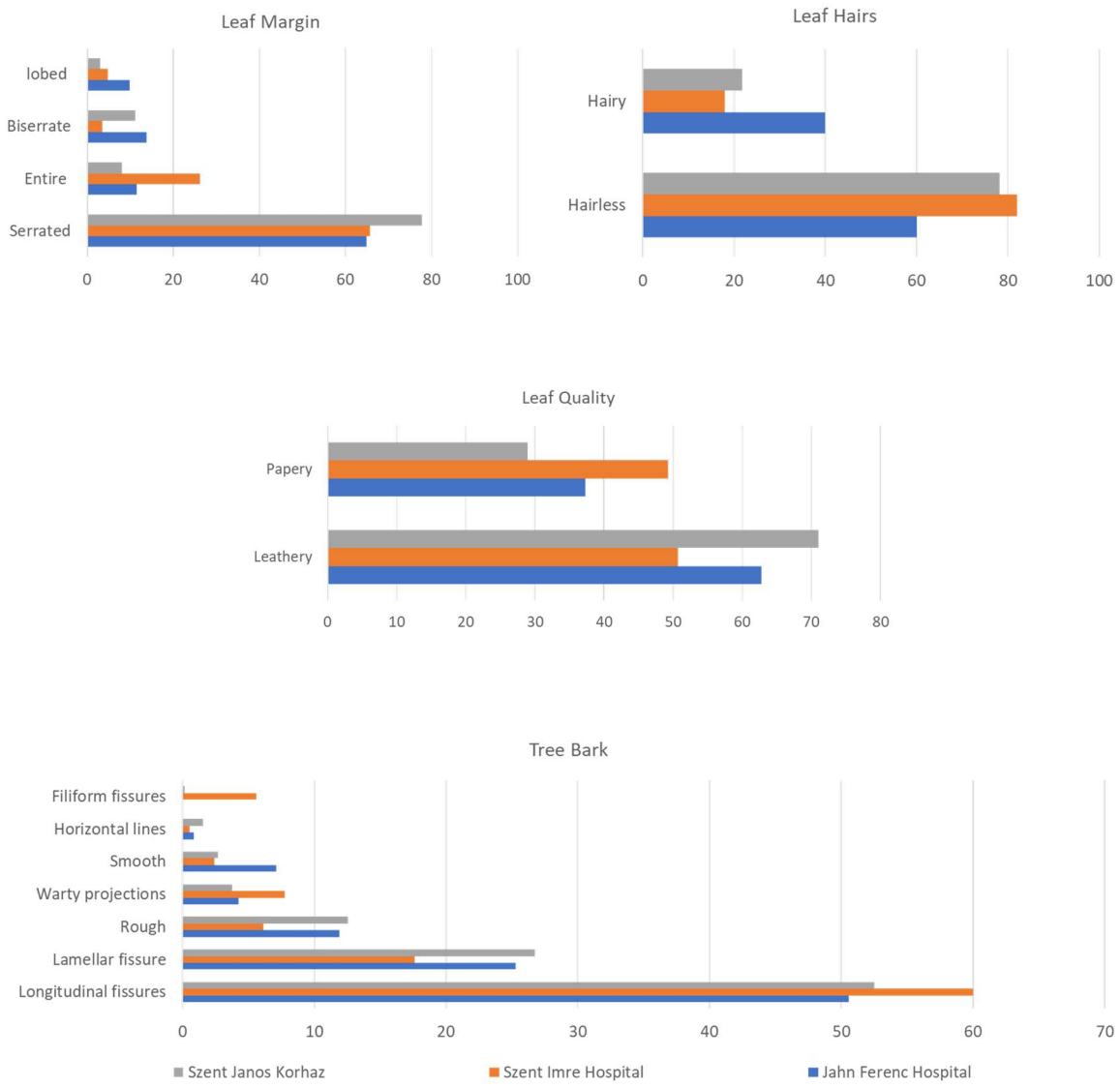

Figure 19 - Plant tactile analysis in three hospitals

Source: by author

4.2.6 Hearing

Some tree fruits provide a food source for birds and some trees provide shelter for birds, so these trees can attract birds and provide a better hospital environment. Overall, all three hospitals have more than 20 percent of trees that attract birds (e.g. *Quercus petraea*; *Tilia cordata*; *Robinia pseudoacacia*; *Quercus robur*; *Morus alba*; *Cerasus avium*), with Szent János Hospital having the highest percentage, at almost 40 percent (Figure 20). The chirping of birds can relax people, and of course bamboo can be planted to create a better hearing scene.

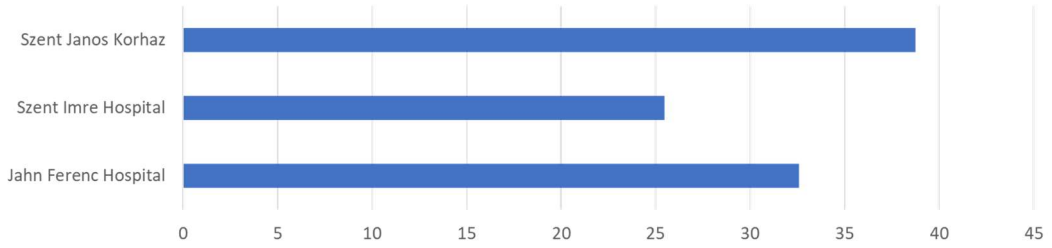

Figure 20 - Percentage of plants that attract birds in three hospitals

Source: by author

4.3 Plant Landscape Evaluation

4.3.1 Analytic Hierarchy Process (AHP)

(1) Calculation of weights

According to Table 4, the planted landscape's suitability is identified as the most crucial indicator, with a weighting of 0.4933. It is followed by the ornamental indicator, which has a weighting of 0.3107, and finally, the healing indicator with a weighting of 0.1960. These findings demonstrate that the majority of individuals perceive the suitability of the planted landscape as a fundamental aspect, while healing, despite its significance, is ranked lower than ornamental factors.

a	b_1	b_2	b_3	Weights
b_1	1	2	1/2	0.4933
b_2	1/2	1	1/2	0.3107
b_3	2	2	1	0.1960

λmax: 3.0536; Ic=0.02993; I_R=0.58; Rc=0.0516.

Table 4 - Criteria layer indicator weights

Source: by author

Table 5 presents the results of the suitability indicators, revealing that safety holds the highest weightage of 0.2018. This signifies that ensuring the safety of the hospital's planted landscape is of utmost importance. Following safety, the comfort of the lighting environment carries a weightage of 0.1117, indicating that the presence of a soothing environment is also a significant factor in determining the suitability of the environment for users. It influences their willingness to spend an extended period within the area.

b_1	c_1	c_2	c_3	c_4	c_5	Weights
c_1	1	1/2	1/3	1/2	1/3	0.0414
c_2	2	1	1/2	2	1/2	0.0834
c_3	3	2	1	2	1/3	0.1117
c_4	2	1/2	1	1	1/4	0.0550
c_5	3	2	3	4	1	0.2018

λmax: 5.1936; Ic=0.04838; I_R=1.12; Rc=0.0432.

Table 5 - Suitability indicator weights

Source: by author

Ornamental indicator weights (Table 6) presents that the green looking ratio holds the highest importance at 0.1270, suggesting that the proportion of green space in the view is crucial for ornamental value. Following that, the richness of ornamental plant features ranks second at 0.0973, encompassing the diversity of leaves, flowers, fruits, and branches in the plants' characteristics.

b_2	c_6	c_7	c_8	c_9	Weights
c_6	1	2	1/3	1/2	0.0519
c_7	1/2	1	1/4	1/2	0.0345
c_8	3	4	1	1	0.1270
c_9	2	2	1	1	0.0973

λmax: 4.0813; Ic=0.02736; I_R=0.90; Rc=0.0304.

Table 6 - Ornamental indicator weights

Source: by author

The weights of healing indicators (Table 7) reveal that the most significant healing indicator is the application of aromatic plants, followed by the application of specific tactile plants. It is speculated that the possible reason for the perceived greater impact of aromatic plants is that they have a healing effect even when people are not actively exposed to them.

b_3	c_{10}	c_{11}	c_{12}	Weights
c_{10}	1	3	2	0.1058
c_{11}	1/3	1	1/2	0.0320
c_{12}	1/2	2	1	0.0582

λmax: 3.0092; Ic=0.00510; I_R=0.58; Rc=0.0088.

Table 7 - Healing indicator weights

Source: by author

Criteria layer (b)	Weights	Object layer (c)	Weights
b_1	0.4933	c_1	0.0414
		c_2	0.0834
		c_3	0.1117
		c_4	0.0550
		c_5	0.2018
b_2	0.3107	c_6	0.0519
		c_7	0.0345
		c_8	0.1270
		c_9	0.0973
b_3	0.1960	c_{10}	0.1058
		c_{11}	0.0320
		c_{12}	0.0582

Table 8 - Criteria layer and object layer index weights

Source: by author

In terms of the overall ranking of the weights of the 12 indicators, suitability-related indicators are relatively high, such as safety, comfort lighting environment, and reasonable spatial scale. Next are the oranmental-related indicators, such as green looking ratio and richness of plant ornamental features. However, in regard to healing-related indicators, especially for special tactile plants and edible plants, they are ranked relatively lower, indicating that most people consider them to be less important.

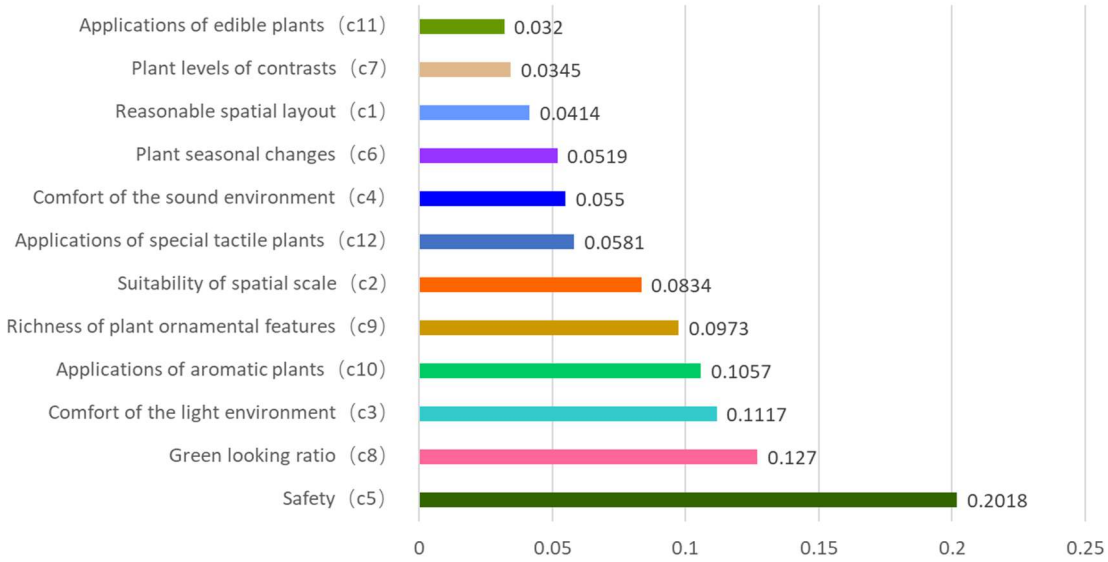

Figure 21 - Objective level indicator weights ordering

Source: by author

(2) Comprehensive evaluation

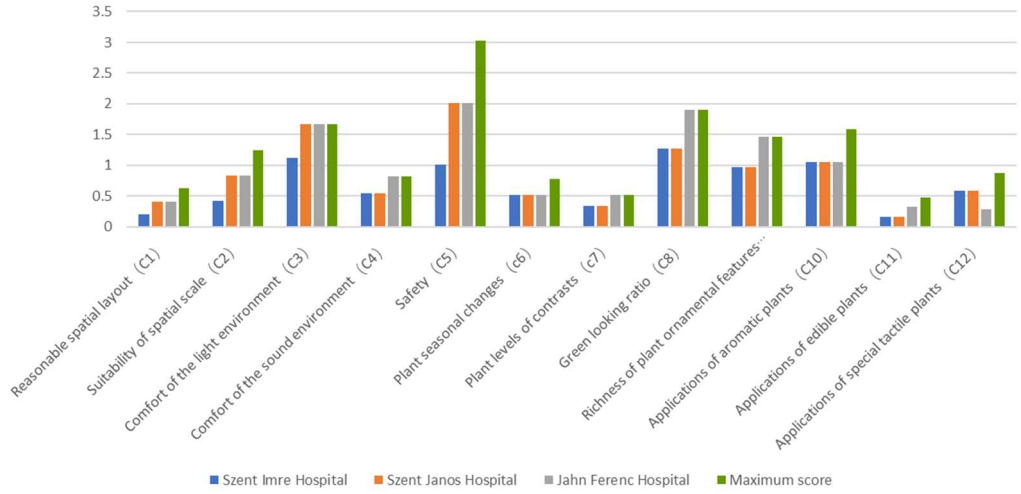

Figure 22 - Single indicator evaluation

Source: by author

Based on the statistical survey results of the returned questionnaires, the average score of each indicator was calculated. The following equations were obtained according to Table 8:

$$v = \sum_{i=1}^{n} u_{b_1} w_{b_1} = \sum_{i=1}^{n} u_{c_1} w_{c_1} =$$

0.0414 u_{c_1} +0.0834 u_{c_2} +0.1117 u_{c_3} +0.0550 u_{c_4} +0.2018 u_{c_5} +0.0519 u_{c_6} +0.0345 u_{c_7} +0.1270u_{c_8} +0.0973u_{c_9} +0.1058$u_{c_{10}}$ +0.0320$u_{c_{11}}$ +0.0582$u_{c_{12}}$. From the above equations, the overall quality score of the outdoor planting landscape of the hospital selected for this experiment can be derived. Figure 22 shows the scores for each indicator using graphical representations, and it can be seen that Szent Imre Hospital scored lower in plant landscape suitability, Jahn Ferenc South-Pest Hospital scored higher in plant landscape ornamental qualities, and none of the three hospitals scored too high in healing.

4.3.2 Fuzzy Comprehensive Evaluation

According to Table 9, the overall ranking of the outdoor landscape quality of the three general hospitals in Budapest is: Jahn Ferenc South-Pest Hospital > Szent János Hospital > Szent Imre Hospital, where Jahn Ferenc South-Pest Hospital and Szent János Hospital are at Level II and Szent Imre Hospital is at Level III. This means that the outdoor planting at szent Imre Hospital is of a low quality and needs to be improved to a large extent.

Hospital Name	Suitability value (7.3995)	Ornamental value (4.6605)	Healing value (2.937)	Overall quality value (15)	M-value (100)	Level
Jahn Ferenc Hospital	5.77	4.40	1.67	11.84	78.91	II
Szent Janos Hospital	5.49	3.11	1.80	10.40	69.32	II
Szent Imre Hospital	3.30	3.11	1.80	8.21	54.71	III

Instruction: maximum values in brackets

Table 9 - Integrated quality evaluation

Source: by author

4.4 Results Summary

4.4.1 Plant application analysis

Szent János Hospital and Jahn Ferenc South-Pest Hospital have low percentage of spiny plants. Szent Imre Hospital has almost 20 percentage of spiny plants. Three hospitals contain less than 15 percent toxic plants and less than 10 percent highly and moderately toxic plants. Szent Imre Hospital contains more poisonous plants than the other two hospitals. The three hospitals had high levels of allergenic plants, especially moderately allergenic plants, with Szent Imre Hospital having the highest level of moderately allergenic plants at nearly 40 percent.

Flowering period with almost no flowering in autumn and winter; And the colours are concentrated in white, yellow and red, with a low proportion of purple. Fruit colour mostly brown when mature, mostly green when not mature, with a few reds and purples. The autumn leaves mostly yellow, followed by the green of the evergreens, with a very small proportion of reds and purples.

The proportion of aromatic plants is around 20 percentage and mostly derived from flowery fragrance. The aromatic period is mainly in summer, followed by spring. Jahn Ferenc South-Pest Hospital and Szent Imre Hospital with almost no autumn or winter aromatic plants.

Almost 80 percent of plants are inedible. About 10 percent of fruit edible. The plants in the three hospitals were normal to the touch, with few special tactile plants and no great variation in tactility. All three hospitals have more than 20 percent of trees that attract birds, with Szent János Hospital having the highest percentage, at almost 40 percent.

4.4.2 Plant landscape evaluation

The top five indicators are: safety, green looking ratio, comfort of the light environment, aromatic plant application, and richness of plant ornamental feature. In the final composite evaluation, Szent Imre Hospital has a low comfort level for the planted landscape environment, while Jahn Ferenc South-Pest Hospital has a high score for landscape ornamental, but none of the three hospitals score too high for healing.

The reasons for low suitability include poor spatial layout, insufficient variety of spaces. Uncomfortable spatial scale, some areas are too empty or depressing, and the plants are not very safe. Low ornamental qualities are mainly due to the lack of significant seasonal changes, single hierarchy of plants and the plants lack of ornamental features. Low healing properties are due to the fact that healing plants are rarely used consciously and widely for three hospitals, including aromatic plants, edible plants and special touch plants (Figure 23).

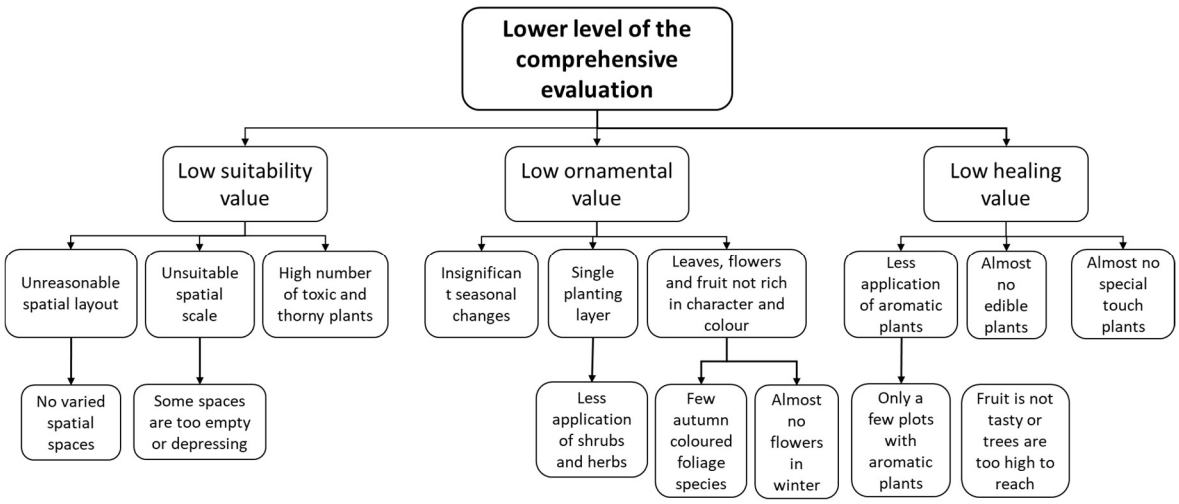

Figure 23 - Problem tree of three hospitals outdoor plant landscape

Source: by author

5 STRATEGY AND DESIGN

5.1 Strategy

The main strategy involves constructing a goal tree based on a problem tree, proposing solutions for each existing problem, and ultimately guiding research to compile a list of topics on evergreen plants, colorful leaf species (full vegetation period/ only autumn), winter-flowering plants, fragrant and aromatic plants, and edible plants.

5.1.1 Objective tree

The objective tree is mainly divided into three aspects, which aim to increase the landscape value by enhancing suitability, ornamental, and healing value. Suitability value can be improved by designing diverse plant spaces, re-designing too empty or too depressing areas to improve spatial scale and ensuring plant safety. Ornamental value can be improved by using plants with different seasonal features, creating hierarchical plant configurations by incorporating shrubs and herbaceous plants, and using colorful and distinctive plants such as colorful foliage plants and winter-flowering plants. Healing value can be enhanced by using a wider range of aromatic, edible, and special touch plants, increasing the application and proportion of these plants (Figure 24).

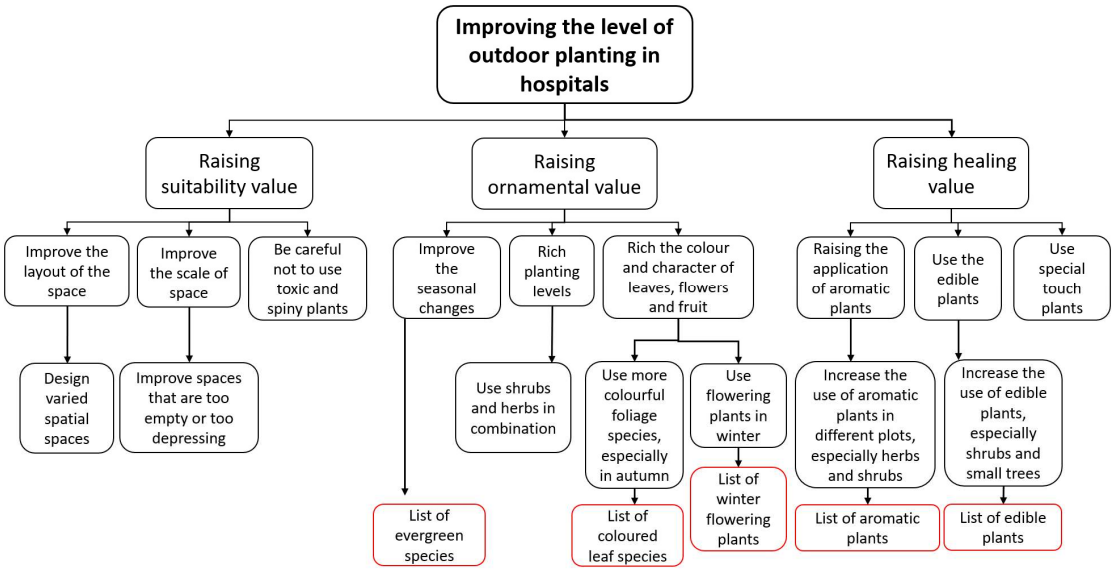

Figure 24 - Objective tree of three hospitals outdoor plant landscape

Source: by author

By analyzing and providing suggestions in these three aspects, the objective tree for enhancing the outdoor plant landscape value of three hospitals in Budapest is established, and a list of five recommend plant species which is suitable for Hungary is provided to offer better guidance for hospital landscape planting design.

5.1.2 Recommended plant list

Based on the objective tree, a compilation of five plant lists suitable for Hungarian hospitals was made by referencing website resources (Find a Plant | North Carolina Extension Gardener Plant Toolbox, n.d.) and course materials during the master's program. The lists include evergreen plant list, colorful foliage plants list, winter-flowering plant list, aromatic plant list, and edible plant list. During the compilation process, special attention was given to the safety of the plants, selecting non-allergenic, thornless, and preferably non-toxic plants (Appendix 09).

5.2 Design Site Selection

The Szent Imre Hospital got low scores in suitability, ornamental, and healing aspects during evaluation, thus multiple sites were considered, and ultimately three sites were selected to improve the hospital's plant landscape in terms of suitability, ornamental, and healing benefits. Site 1 and Site 2 are located near the elderly care and rehabilitation buildings, while Site 3 is adjacent to the main building. Furthermore, the hospital is distinctly divided into zones, where the majority of patients are concentrated in the blue-framed area, while the black-framed area is mostly occupied by staff with almost no patients. Therefore, site selection was primarily based on areas frequently visited by patients, and Site 3 was chosen as it is one of the few patients gathering areas within the black-framed zone due to its proximity to the main building (Figure 25).

The Szent János Hospital selected two sites, among which Site 4 was chosen due to its proximity to the yellow buildings that include the trauma and neurology departments. Considering that there will be a significant number of psychiatric patients resting in this area, it was deemed an appropriate choice. The Szent János Hospital does not have a distinct division between staff and patient zones, but its most significant feature is it has two main

axes that bear the primary flow of people. Therefore, the strip-like green spaces located on both sides of the axes are very importance, and Site 5 is situated on the strip-like green space along the primary axis of the site, serving as an example for other hospitals' strip-like green spaces (Figure 26).

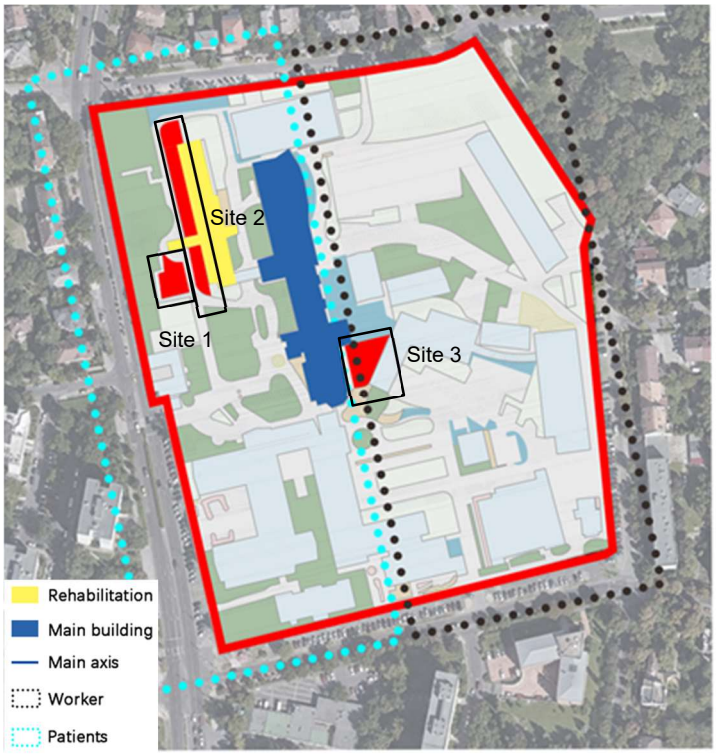

Figure 25 - Szent Imre Hospital site selection map

Source: Google, 2023, edited by author

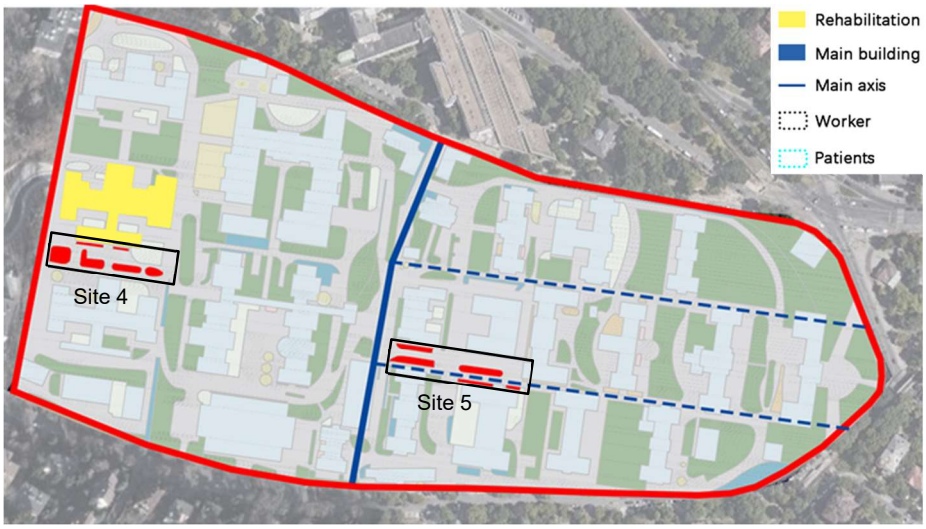

Figure 26 - Szent János Hospital site selection map

Source: Google, 2023, edited by author

The Jahn Ferenc South-Pest Hospital only selected one site, which is located in the public garden between the main building and the convalescent home. This hospital also has a clear division between staff and patient areas, and Site 6 is situated in the garden area frequently visited by patients. Furthermore, this area contains a small path that connects the main building to other areas, which makes it an ideal location for landscape improvement as it not only provides a place for patients to rest and converse, but also attracts a significant flow of people passing through the area (Figure 27).

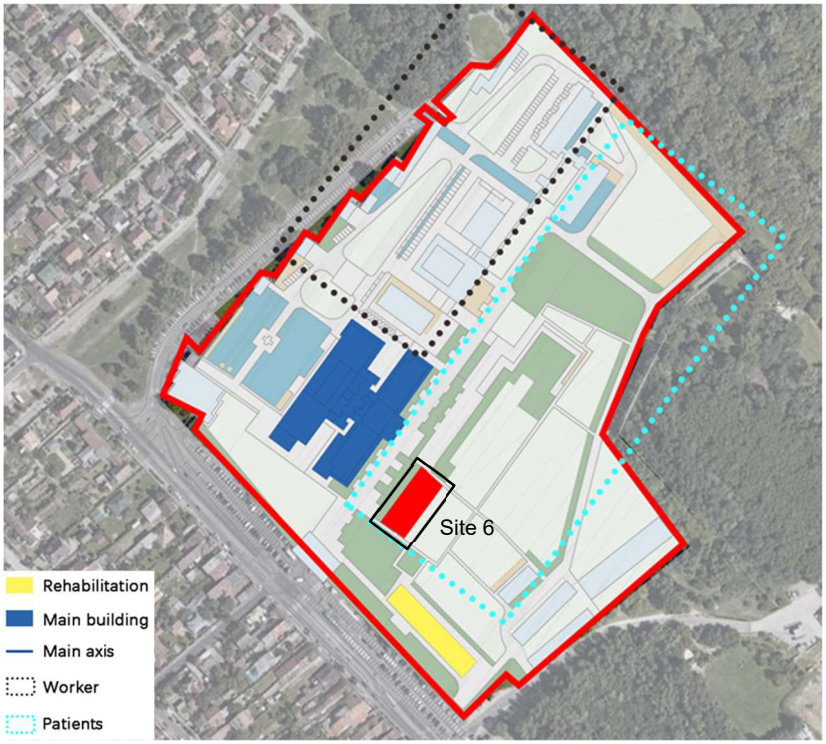

Figure 27 - Jahn Ferenc Hospital site selection map

Source: Google, 2023, edited by author

5.3 Design Site Analysis

Site 1 is a relatively regular-shaped area that is separated from the surrounding green spaces by paths, and there are three benches along the border of the green area. Most of the people who stay here are patients and their activities are communication, rest, and scenery appreciation. Currently, there are almost no plants present in this area, so the main aim is to improve the ornamental and healing value of this site (Figure 28).

Figure 28 - Current situation of Site 1

Source: by author

Site 2 is a linear green space located on both sides of the building entrance, bordered by the main road. Most people only pass through this green area, and there are almost no people will stay here for a long time. The main passers-by are doctors, patients, and patient's relatives. The current situation of the site shows that there are many large evergreen trees planted, but the plant ornamental features and hierarchy are not rich. It can also be seen that the large evergreen trees have blocked the sightlines and occupied a part of the road space, and the spatial scale of plantings needs to be improved. Therefore, the main purpose of this site is to improve its suitability and ornamental value (Figure 29).

Figure 29 - Current situation of Site 2

Source: by author

Site 3 is a green space located near the back entrance of the main building. Relatively few people pass through this green space, and the main people flow is from the pathway into the main building. However, there is a rest area next to this green space, where staff and patients often come to smoke and chat. We can see that there are almost no plants in this green space in current situation, and the ornamental value is low. The purpose of choosing this green space is to create a more visually appealing plant landscape, so that people can feel the beauty when they rest in this area (Figure 30).

Figure 30 - Current situation of Site 3

Source: by author

Site 4 is a linear green space located in front of the building including trauma and neurosurgery departments. This strip of green space has benches, where people can have a rest and chat, and most people are patients. As for the current planting situation of the site, many crowded trees are planted in the large green space on both sides, and the species and planting levels are very simple. The middle strip of green space is planted with large evergreen trees and some green shrubs, but lacks therapeutic plants, and the viewing effect of the plant landscape is poor. Therefore, the purpose of choosing this site is to improve its ornamental and healing value, providing patients with a planting environment which is more beautiful and also contributes to their recovery (Figure 31).

Figure 31 - Current situation of Site 4

Source: by author

Site 5 is a linear green space, but unlike others, it is located on the hospital's main axis, which means that more people will pass through it. Most people are patients and their families, and staff also come, but not as frequently as patients. Most people just pass through this green space, but there are also benches available for those who want to stop and rest. The site itself is not large, but the many large trees planted make it feel crowded and oppressive. Currently, the site has some large evergreen trees, which obscure the view and do not have much ornamental value. Additionally, the other trees planted lack diverse

and layered visual features. Therefore, it is clear that as a green space located on the main pedestrian flow, the suitability and ornamental value of this site need to be improved (Figure 32).

Figure 32 - Current situation of Site 5

Source: by author

Site 6 is a relatively regular-shaped green space located between the main building and the convalescent home, in the public garden that patients often visit. The boundaries are separated by two roads, and most of the people who come here are patients. There also have benches for people to rest, so they often sit in this area to enjoy the scenery, chat, or rest. The current vegetation on this site mainly consists of trees and shrubs, with a lack of herbaceous plants. The site is comfortable and has moderate ornamental value, but almost no healing value. Therefore, the selection of this site aims to improve the ornamental value of the site's plant landscape and increase its healing value (Figure 33).

Figure 33 - Current situation of Site 6

Source: by author

The Figure 34 illustrates the lighting and people flow analysis of the sites. All six sites are mostly sunny areas, except for semi-sunny area in Site 5. However, trees will be used to create shade area for shade-loving plants to enhance species diversity, instead of only use full-sun plants.

In terms of people flow, Site 1, Site 3, and Site 6 have relatively regular shapes and

experience few people flows through their interiors. Therefore, their design should not impede the internal people flow. Also as the site boundaries are almost always crossed by main people flow, the planting design should be integrated with the people flow by using strip-shaped planting forms that guide pedestrian movement.

Site 2, Site 4, and Site 5 are all linear green spaces, with almost no people flow passing through the green space itself. However, there is still some people flows between the two linear green spaces, and most of them are the main people flow in the hospitals. Thus, these types of green spaces should consider their suitability value, particularly with regard to spatial scale and landscape layout, so as not to impede the pedestrian flow on the main road, and also need have some visual appeal and continuity (Figure 34).

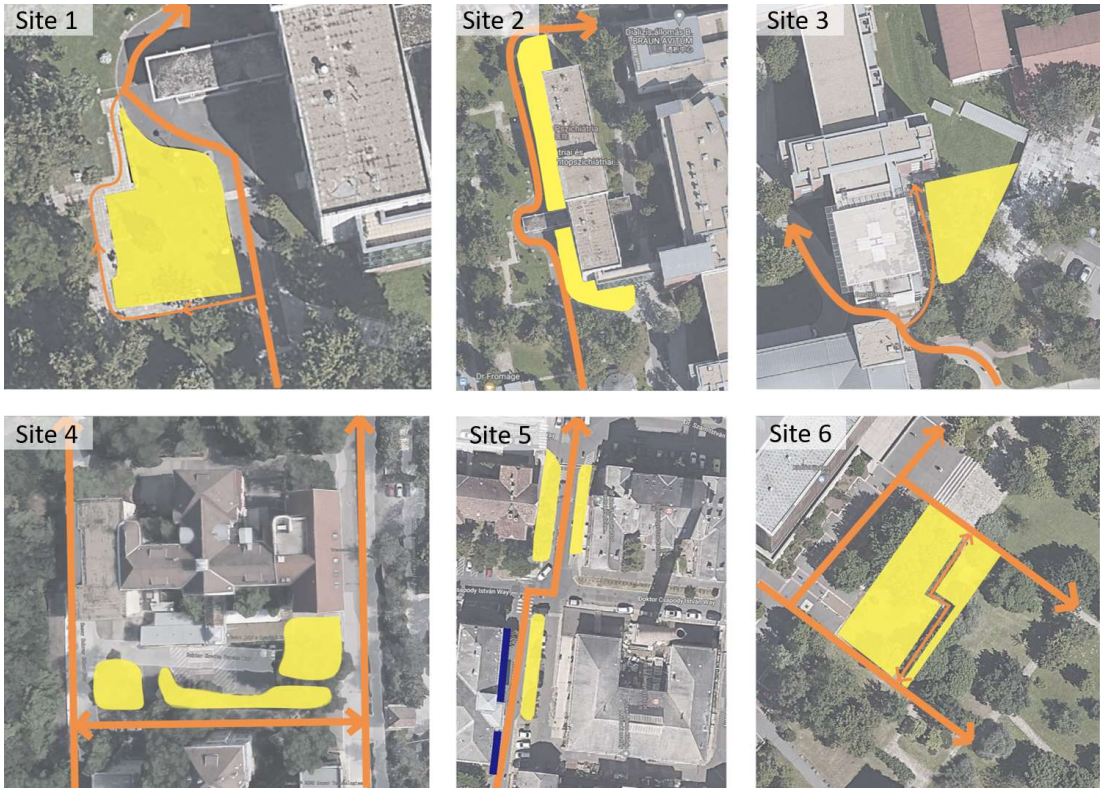

Figure 34 - People flow and sunlight analysis maps for the six sites

Source: Google, 2023, edited by author

5.4 Design Plan

The site design revolves around the results of site analysis, with a focus on the aspects of the site that need improvement, and appropriate plants are selected accordingly. Using the recommended plant list provided in this research strategy for design, and combining

different sun exposure conditions and water requirements, different plant combinations are arranged with the aim of providing references for different planting conditions.

According to the site analysis, Site 1 is in a full-sun environment (Figure 34). Therefore, most of the selected plants are sun-loving, but some shade-tolerant plants such as A*ucuba japonica* 'Variegata' are also be selected and arranged under the shade of trees. The analysis also revealed that there will have people flow in the middle of the site. As a result, three entrances have been incorporated into the site plan to avoid obstructing pedestrian flow. Several seats have been placed at the site boundary for people to rest. To ensure privacy and a sense of security, taller shrubs have been chosen to be planted behind the seats. Even if there is pedestrian traffic passing through the site, it will not disturb the people resting (Figure 35). In terms of plant selection, most of the chosen plants are those that can stimulate human senses and increase the therapeutic effect of the site. For example, *Stachys byzantina* (special tactile sensation), *Salvia officinalis* (medicinal and fragrant), and *Caryopteris* × *clandonensis* 'Summer Sorbet' (fragrant leaves).

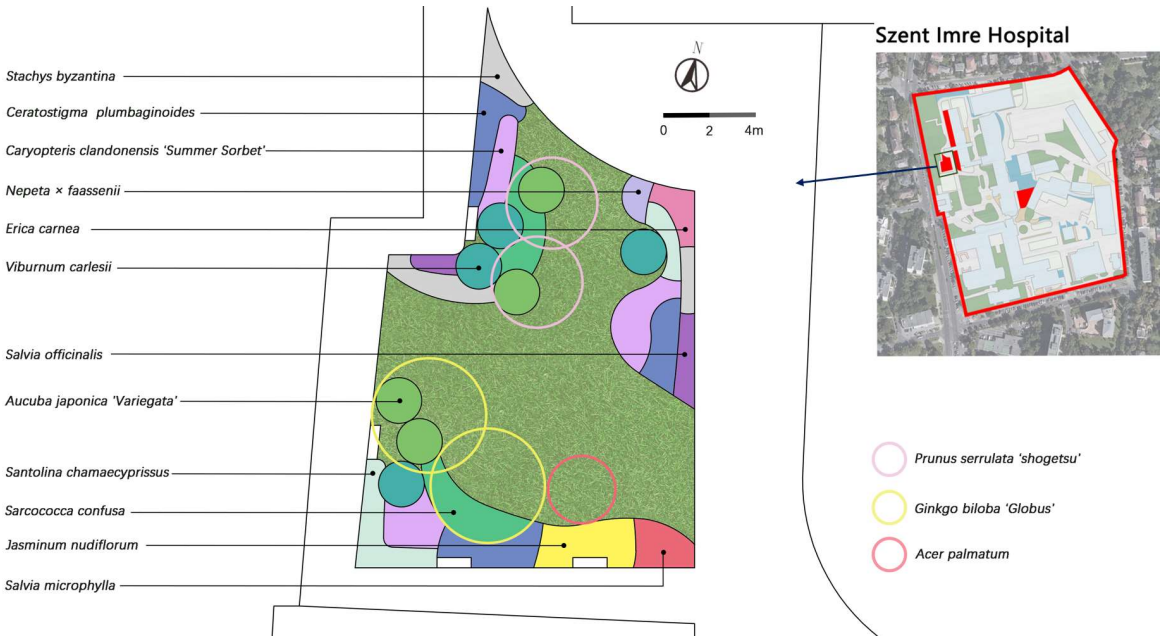

Figure 35 - Site 1 planting design plan

Source: by author

Site 2 is also a full-sun environment. Unlike Site 1, it is a strip-shaped green space with no pedestrian traffic inside, so the planting form is mostly linear and there are no other entrances except for the two sides. The site is primarily designed to improve suitability and

ornamental value, with loose planting of trees and no overly tall shrubs chosen to provide a comfortable spatial layout (Figure 36). In terms of plant selection, plants with high ornamental value are primarily chosen, such as *Helictotrichon sempervirens* (blue-green leaves), *Cornus sericea* 'Flaviramea' (yellow-green branches), and *Hypericum* × *moserianum* 'Tricolor' (pink, yellow, and green variegated leaves).

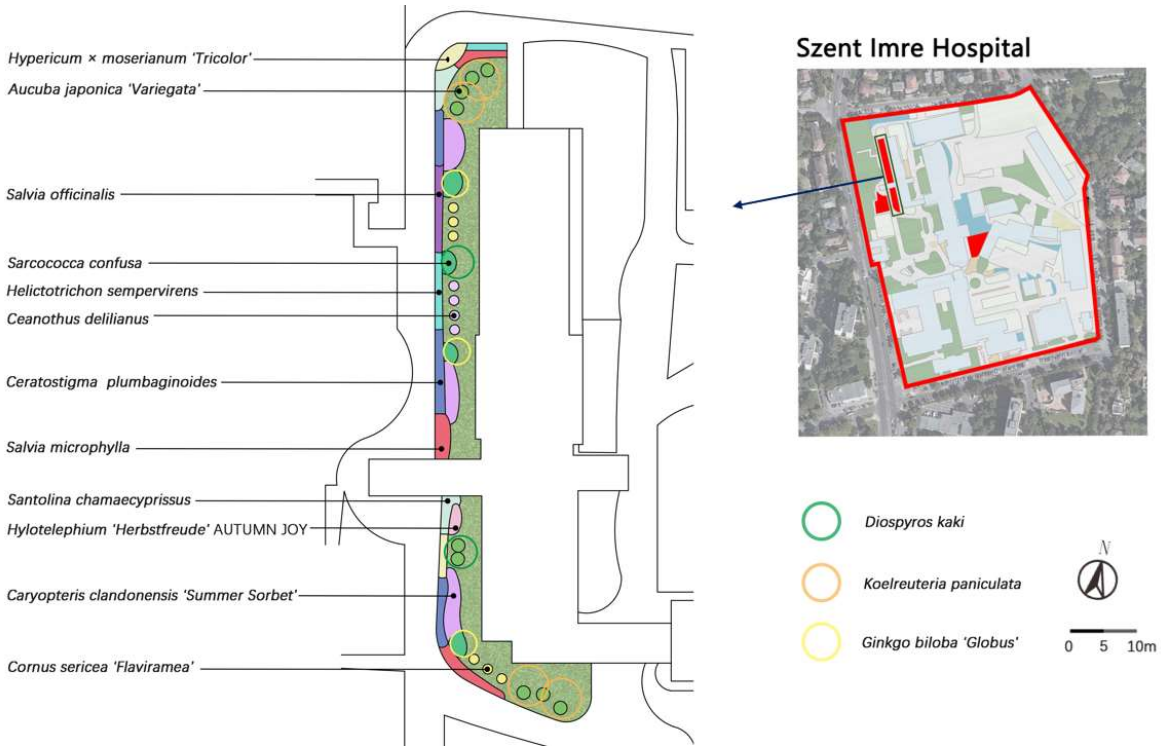

Figure 36 - Site 2 planting design plan

Source: by author

Site 3 is also a full-sun environment, but due to the presence of a rest area in the lower right area of the site, a wide pedestrian path is created using large trees, and an entrance to the rest area is provided. To avoid obstructing the flow of people from the main building to the rest area, only three small trees are planted in the green area adjacent to the main road, without any shrubs or herbaceous plants (Figure 37).

In terms of plant selection, mainly plants with high ornamental value were chosen, but the growing conditions are different from site 2. Most of the plants grow in the shade of trees, and the soil is moist or occasionally dry. Therefore, ornamental plants adapted to moist conditions were selected, such as *Cenchrus alopecuroides* 'Hameln', *Heuchera villosa* 'Caramel', and *Brunnera macrophylla* 'Silver Heart'.

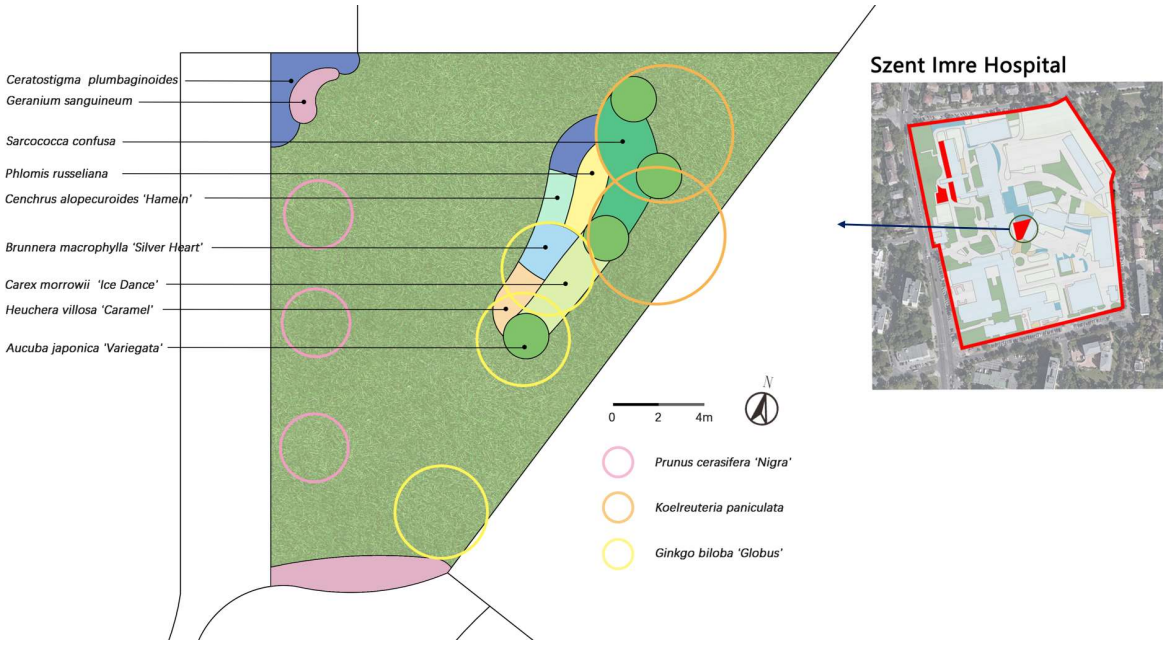

Figure 37 - Site 3 planting design plan

Source: by author

Site 4 is a linear flowerbed with two regular green spaces, primarily designed to enhance the healing value of the site. Therefore, medicinal plants, aromatic plants, and plants with special tactile properties were selected to provide a reference for improving the healing value of a well-drained, full-sun environment. Of course, some shrubs and herbaceous plants were also added to the regular green spaces on both sides to increase the layering and ornamental features of the plants, thereby enhancing their ornamental value (Figure 38).

Site 5 is also a linear green space, but its growing environment is full sun and partial shade with moist soil. The main purpose of the site design is to improve suitability and ornamental value. The site is adjacent to the main road and the western green space is narrow, so large trees are not suitable as they would make the space too cramped. Therefore, shrubs and herbaceous plants are mostly used (Figure 39). The plant selection also focuses on plants that are both ornamental and can thrive in full sun and moist conditions, such as *Choisya ternata*, *Cornus sanguinea* 'Ann's winter orange', and *Salvia yangii*.

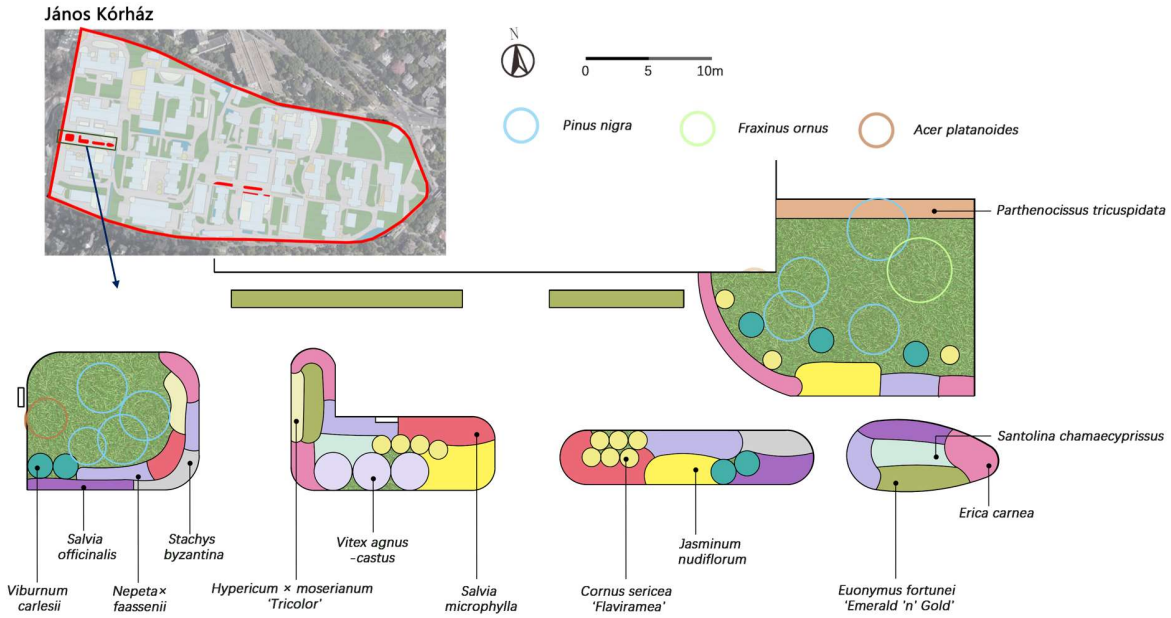

Figure 38 - Site 4 planting design plan

Source: by author

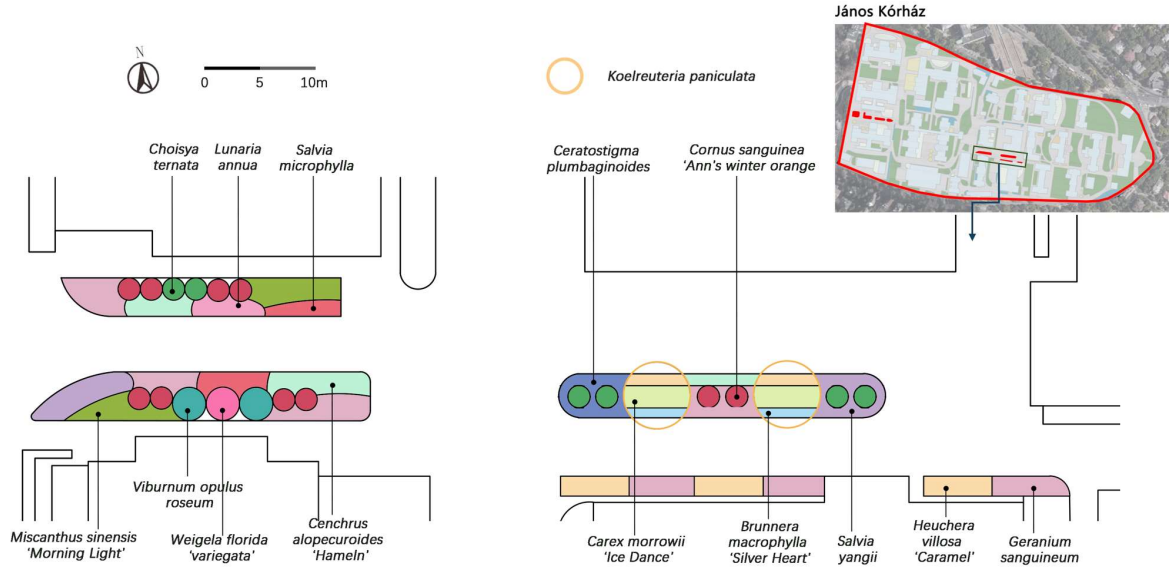

Figure 39 - Site 5 planting design plan

Source: by author

Site 6 is a relatively regular-shaped green space that still maintains a full-sun environment and medium drainage. The main purpose is to enhance the healing properties of the site, so medicinal and aromatic plants are planted along the road and rest areas. In terms of visual design, it is not always necessary to plant trees or large shrubs along the road, as this would block the view from the path to the main building. In terms of color coordination, the left side of the site is mostly warm-toned, such as pink, yellow, and red, while the right side is mostly cool-toned, such as blue, purple, and white (Figure 40).

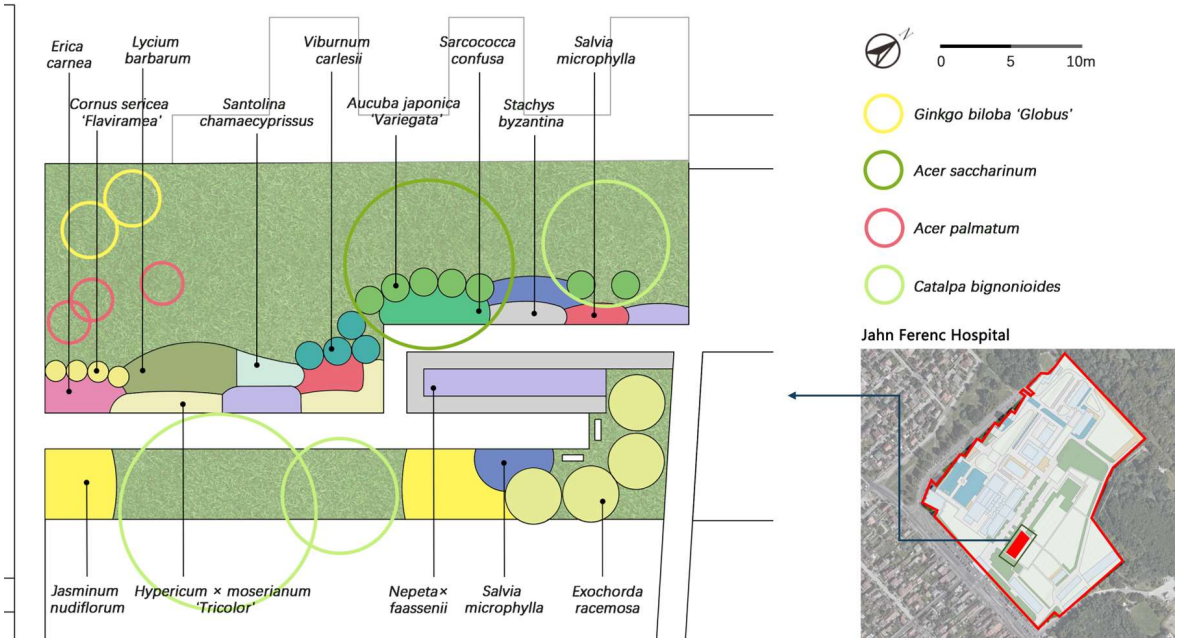

Figure 40 - Site 6 planting design plan

Source: by author

The overall site design is based on different types of green spaces, varying growth conditions, and the main design objectives associated with the site. Some areas aim to improve ornamental value while others aim to improve healing value. Based on different key factors, suitable plants are selected to form plant combinations representative of the growth environment. It is hoped that by using a diverse range of plants and combinations, the actual planting design for the Budapest hospital will be referenced.

6 CONCLUSION

This paper starts with studying the current status of plant landscaping in three hospitals, conducting on-site investigations and analyzing the current plant planting situation, and combining with the Analytic Hierarchy Process for plant landscape evaluation. Finally, it is found that the planting pattern of hospitals is relatively simple, and the frequency of using shrubs and herbaceous plants is low. The colors, ornamental features, and different levels of plants in most green spaces are not rich enough. For the application of horticultural therapy, through evaluation, we can see that almost all three hospitals have no conscious application of horticultural therapy. Therefore, the three hospitals scored poorly in terms of healing value. In order to help hospitals better apply horticultural therapy, this research provides a list of five recommended plants and selects actual sites for application, hoping to provide reference for plant selection and combination so that hospitals can create their own therapeutic landscapes.

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ATTACHMENT

No.	Name	Size
M-01	Jahn Ferenc South-Pest Hospital tree survey map	841mm×594mm
M-02	Szent Imre Hospital tree survey map	841mm×594mm
M-03	Szent János Hospital tree survey map	841mm×594mm
M-04	Site 1 planting design plan	297mm×420mm
M-05	Site 2 planting design plan	297mm×420mm
M-06	Site 3 planting design plan	297mm×420mm
M-07	Site 4 planting design plan	297mm×420mm
M-08	Site 5 planting design plan	297mm×420mm
M-09	Site 6 planting design plan	297mm×420mm

APPENDIX

01 Jahn Ferenc South-Pest Hospital tree survey table (Source: Pap, 2017)

1	*Acer saccharinum*	2	*Acer platanoides*
3	*Picea pungens* 'Koster'	4	*Picea pungens* 'Koster'
5	*Acer platanoides*	6	*Acer platanoides* 'Crimson King'
7	*Acer platanoides* 'Crimson King'	8	*Ailanthus altissima*
9	*Acer platanoides*	10	*Populus simonii* 'Fastigiata'
11	*Salix alba*	12	*Salix alba*
13	*Fraxinus excelsior*	14	*Populus canescens*
15	*Catalpa bignonioides*	16	*Corylus colurna*
17	*Acer negundo*	18	*Acer negundo*
19	*Acer negundo*	20	*Morus alba*
21	*Prunus avium*	22	*Acer negundo*
23	*Acer negundo*	24	*Populus nigra*
25	*Acer negundo*	26	*Acer negundo*
27	*Acer negundo*	28	*Populus alba*
29	*Acer negundo*	30	*Acer negundo*
31	*Acer negundo*	32	*Acer negundo*
33	*Acer negundo*	34	*Acer negundo*
35	*Acer negundo*	36	*Carpinus betulus*
37	*Quercus petraea*	38	*Acer negundo*
39	*Carpinus betulus*	40	*Corylus colurna*
41	*Catalpa bignonioides*	42	*Quercus robur*
43	*Populus alba*	44	*Populus alba*
45	*Quercus petraea*	46	*Quercus petraea*
47	*Quercus petraea*	48	*Acer saccharinum*
49	*Acer saccharinum*	50	*Corylus colurna*
51	*Corylus colurna*	52	*Quercus petraea*

53	*Corylus colurna*	54	*Corylus colurna*
55	*Acer saccharinum*	56	*Acer saccharinum*
57	*Quercus robur*	58	*Quercus robur*
59	*Picea pungens*	60	*Picea pungens*
61	*Corylus colurna*	62	*Quercus robur*
63	*Carpinus betulus*	64	*Corylus colurna*
65	*Corylus colurna*	66	*Picea pungens*
67	*Quercus petraea*	68	*Platanus x acerifolia*
69	*Acer negundo*	70	*Platanus x acerifolia*
71	*Acer platanoides*	72	*Tilia cordata*
73	*Acer saccharinum*	74	*Platanus x acerifolia*
75	*Catalpa bignonioides*	76	*Acer platanoides*
77	*Fraxinus excelsior*	78	*Catalpa bignonioides*
79	*Prunus avium*	80	*Platanus × acerifolia*
81	*Populus simonii*	82	*Tilia cordata*
83	*Acer platanoides*	84	*Tilia cordata*
85	*Acer platanoides*	86	*Tilia cordata*
87	*Elaeagnus angustifolia*	88	*Catalpa bignonioides*
89	*Catalpa bignonioides*	90	*Catalpa bignonioides*
91	*Pinus nigra*	92	*Acer platanoides*
93	*Acer platanoides*	94	*Tilia cordata*
95	*Catalpa bignonioides*	96	*Catalpa bignonioides*
97	*Acer platanoides*	98	*Acer platanoides*
99	*Picea abies*	100	*Picea abies*
101	*Picea abies*	102	*Platanus × acerifolia*
103	*Platanus × acerifolia*	104	*Catalpa bignonioides*
105	*Catalpa bignonioides*	106	*Catalpa bignonioides*
107	*Acer platanoides*	108	*Catalpa bignonioides*
109	*Cydonia oblonga*	110	*Catalpa bignonioides*
111	*Catalpa bignonioides*	112	*Rhus typhina* 'Dissecta'

113	*Rhus typhina* 'Dissecta'	114	*Rhus typhina* 'Dissecta'
115	*Ailanthus altissima*	116	*Catalpa bignonioides*
117	*Catalpa bignonioides*	118	*Pinus wallichiana*
119	*Tilia platyphyllos*	120	*Ulmus minor*
121	*Ulmus minor*	122	*Tilia platyphyllos*
123	*Tilia cordata*	124	*Tilia platyphyllos*
125	*Tilia platyphyllos*	126	*Platanus × acerifolia*
127	*Acer saccharinum*	128	*Acer platanoides*
129	*Elaeagnus angustifolia*	130	*Carpinus betulus*
131	*Catalpa bignonioides*	132	*Catalpa bignonioides*
133	*Salix alba*	134	*Catalpa bignonioides*
135	*Fraxinus ornus*	136	*Quercus petraea*
137	*Quercus petraea*	138	*Catalpa bignonioides*
139	*Catalpa bignonioides*	140	*Acer saccharinum*
141	*Quercus petraea*	142	*Acer saccharinum*
143	*Platanus × acerifolia*	144	*Pinus wallichiana*
145	*Pinus wallichiana*	146	*Pinus wallichiana*
147	*Populus simonii*	148	*Picea pungens* 'Koster'
149	*Picea pungens* 'Koster'	150	*Picea pungens* 'Koster'
151	*Acer saccharinum*	152	*Catalpa bignonioides*
153	*Acer saccharinum*	154	*Carpinus betulus*
155	*Quercus petraea*	156	*Robinia pseudoacacia*
157	*Fraxinus ornus*	158	*Fraxinus ornus*
159	*Quercus petraea*	160	*Corylus colurna*
161	*Corylus colurna*	162	*Corylus colurna*
163	*Quercus petraea*	164	*Picea abies*
165	*Picea abies*	166	*Betula pendula*
167	*Corylus colurna*	168	*Robinia pseudoacacia*
169	*Robinia pseudoacacia*	170	*Quercus petraea*
171	*Quercus cerris*	172	*Quercus petraea*

173	*Quercus petraea*	174	*Elaeagnus angustifolia*
175	*Prunus cerasifera* 'Atropurpurea'	176	*Prunus cerasifera* 'Atropurpurea'
177	*Prunus cerasifera* 'Atropurpurea'	178	*Prunus cerasifera* 'Atropurpurea'
179	*Prunus cerasifera* 'Atropurpurea'	180	*Prunus cerasifera* 'Atropurpurea'
181	*Ailanthus altissima*	182	*Thuja orientalis*
183	*Thuja orientalis*	184	*Thuja orientalis*
185	*Thuja orientalis*	186	*Thuja orientalis*
187	*Thuja orientalis*	188	*Thuja orientalis*
189	*Thuja orientalis*	190	*Thuja orientalis*
191	*Thuja orientalis*	192	*Thuja orientalis*
193	*Thuja orientalis*	194	*Acer negundo*
195	*Acer saccharinum*	196	*Acer saccharinum*
197	*Acer negundo*	198	*Acer saccharinum*
199	*Acer negundo*	200	*Acer negundo*
201	*Acer negundo*	202	*Carpinus betulus*
203	*Populus alba*	204	*Corylus colurna*
205	*Acer saccharinum*	206	*Picea abies*
207	*Corylus colurna*	208	*Fraxinus ornus*
209	*Picea abies*	210	*Picea abies*
211	*Picea abies*	212	*Quercus petraea*
213	*Picea pungens* 'Koster'	214	*Carpinus betulus*
215	*Carpinus betulus*	216	*Fraxinus ornus*
217	*Fraxinus ornus*	218	*Fraxinus ornus*
219	*Corylus colurna*	220	*Salix alba*
221	*Betula pendula*	222	*Betula pendula*
223	*Betula pendula*	224	*Carpinus betulus*
225	*Corylus colurna*	226	*Acer platanoides*
227	*Malus sp.*	228	*Prunus sp.*
229	*Aesculus hippocastanum*	230	*Malus sp.*
231	*Acer platanoides*	232	*Robinia pseudoacacia*

233	*Pyrus sp.*	234	*Robinia pseudoacacia*
235	*Celtis occidentalis*	236	*Tilia platyphyllos*
237	*Acer platanoides*	238	*Acer saccharinum*
239	*Tilia cordata*	240	*Platanus × acerifolia*
241	*Platanus × acerifolia*	242	*Acer saccharinum*
243	*Acer negundo*	244	*Acer saccharinum*
245	*Malus sp.*	246	*Aesculus hippocastanum*
247	*Carpinus betulus*	248	*Acer platanoides*
249	*Quercus cerris*	250	*Quercus cerris*
251	*Quercus cerris*	252	*Quercus cerris*
253	*Quercus cerris*	254	*Corylus colurna*
255	*Quercus robur*	256	*Carpinus betulus*
257	*Quercus robur*	258	*Betula pendula*
259	*Betula pendula*	260	*Tilia platyphyllos*
261	*Acer saccharinum*	262	*Acer saccharinum*
263	*Fraxinus ornus*	264	*Celtis occidentalis*
265	*Celtis occidentalis*	266	*Tilia cordata*
267	*Acer platanoides*	268	*Acer platanoides*
269	*Betula pendula*	270	*Acer platanoides*
271	*Fraxinus ornus*	272	*Corylus colurna*
273	*Acer platanoides*	274	*Tilia cordata*
275	*Tilia cordata*	276	*Tilia cordata*
277	*Tilia cordata*	278	*Tilia cordata*
279	*Quercus petraea*	280	*Tilia cordata*
281	*Acer saccharinum*	282	*Corylus colurna*
283	*Fraxinus ornus*	284	*Fraxinus ornus*
285	*Quercus petraea*	286	*Corylus colurna*
287	*Carpinus betulus*	288	*Fraxinus ornus*
289	*Aesculus hippocastanum*	290	*Aesculus hippocastanum*
291	*Celtis occidentalis*	292	*Malus sp.*

293	*Acer platanoides*	294	*Salix alba*
295	*Acer platanoides*	296	*Acer platanoides*
297	*Celtis occidentalis*	298	*Aesculus hippocastanum*
299	*Aesculus hippocastanum*	300	*Salix alba*
301	*Picea pungens* 'Koster'	302	*Picea abies*
303	*Carpinus betulus*	304	*Acer platanoides*
305	*Acer saccharinum*	306	*Celtis occidentalis*
307	*Acer platanoides*	308	*Acer pseudoplatanus*
309	*Populus simonii* 'Fastigiata'	310	*Populus simonii* 'Fastigiata'
311	*Acer platanoides*	312	*Acer platanoides*
313	*Acer platanoides*	314	*Acer platanoides*
315	*Acer platanoides*	316	*Acer platanoides*
317	*Acer platanoides*	318	*Acer platanoides*
319	*Acer platanoides*	320	*Acer platanoides*
321	*Acer platanoides*	322	*Acer platanoides*
323	*Acer platanoides*	324	*Acer platanoides*
325	*Acer platanoides*	326	*Acer platanoides*
327	*Acer platanoides*	328	*Acer platanoides*
329	*Acer platanoides*	330	*Acer platanoides*
331	*Picea pungens* 'Koster'	332	*Picea pungens* 'Koster'
333	*Populus simonii* 'Fastigiata'	334	*Catalpa bignonioides*
335	*Pinus nigra*	336	*Pinus nigra*
337	*Pinus wallichiana*	338	*Platanus × acerifolia*
339	*Tilia platyphyllos*	340	*Platanus × acerifolia*
341	*Prunus avium*	342	*Platanus × acerifolia*
343	*Platanus × acerifolia*	344	*Catalpa bignonioides*
345	*Platanus × acerifolia*	346	*Tilia platyphyllos*
347	*Acer platanoides*	348	*Tilia cordata*
349	*Acer saccharinum*	350	*Acer saccharinum*
351	*Celtis occidentalis*	352	*Celtis occidentalis*

353	*Acer saccharinum*	354	*Acer pseudoplatanus*
355	*Robinia pseudoacacia*	356	*Robinia pseudoacacia*

02 Jahn Ferenc South-Pest Hospital shrub and herbaceous survey table (Source: by author)

Number	Latin name	Area (m^2)
Shurb		
1	*Berberis thunbergii*	58
2	*Berberis thunbergii* 'Atropurpurea'	236
3	*Berchemia lineata*	61
4	*Buddleja fallowiana*	42
5	*Cornus mas*	815
6	*Cotoneaster horizontalis*	149
7	*Forsythia suspensa*	625
8	*Juniperus sabina*	453
9	*Lagerstroemia indica*	355
10	*Ligustrum ovalifolium*	67
11	*Lonicera fragrantissima*	91
12	*Lonicera korolkowii*	349
13	*Mahonia fortunei*	414
14	*Prunus laurocerasus*	16
15	*Swida macrophylla*	391
16	*Symphoricarpos sinensis*	82.8
17	*Viburnum rhytidophyllum*	61
Herbaceous		
	Latin name	Area (m^2)
1	*Hedera helix*	64
2	*Hemerocallis fulva*	24

03 Szent Imre Hospital tree survey table (Source: Wittmann, 2015)

1	*Ailanthus alfissima*	2	*Prunus cerasifera* 'Atropurpurea'
3	*Prunus cerasifera* 'Atropurpurea'	4	*Prunus cerasifera* 'Atropurpurea'
5	*Prunus cerasifera* 'Atropurpurea'	6	*Prunus cerasifera* 'Atropurpurea'
7	*Prunus cerasifera* 'Atropurpurea'	8	*Platanus × hybrida*
9	*Platanus × hybrida*	10	*Platanus × hybrida*
11	*Populus × canadensis*	12	*Platanus × hybrida*
13	*Fraxinus angustifolia subsp. pannonica*	14	*Fraxinus angustifolia subsp. pannonica*
15	*Sophora japonica*	16	*Sophora japonica*
17	*Platanus × hybrida*	18	*Sophora japonica*
19	*Sophora japonica*	20	*Sophora japonica*
21	*Morus alba*	22	*Populus nigra* 'Italica'
23	*Sophora japonica*	24	*Sophora japonica*
25	*Morus alba*	26	*Fraxinus angustifolia subsp. pannonica*
27	*Fraxinus angustifolia subsp. pannonica*	28	*Fraxinus angustifolia subsp. pannonica*
29	*Fraxinus angustifolia subsp. pannonica*	30	*Populus nigra* 'Italica'
31	*Populus nigra 'Italica'*	32	*Tilia cordata*
33	*Populus nigra 'Italica'*	34	*Populus nigra* 'Italica'
35	*Acer campestre*	36	*Acer campestre*
37	*Salix alba*	38	*Morus alba*
39	*Acer negundo*	40	*Populus nigra* 'Italica'
41	*Celtis occidentalis*	42	*Celtis occidentalis*
43	*Populus nigra 'Italica'*	44	*Prunus serotina*
45	*Fraxinus angustifolia subsp. pannonica*	46	*Fraxinus angustifolia subsp. pannonica*
47	*Sophora japonica*	48	*Sophora japonica*
49	*Sophora japonica*	50	*Sophora japonica*
51	*Sophora japonica*	52	*Populus nigra* 'Italica'

53	*Fraxinus angustifolia subsp. pannonica*	54	*Sophora japonica*
55	*Populus nigra* 'Italica'	56	*Sophora japonica*
57	*Populus nigra* 'Italica'	58	*Populus nigra* 'Italica'
59	*Sophora japonica*	60	*Aesculus hippocastanum*
61	*Gleditsia triacanthos*	62	*Aesculus hippocastanum*
63	*Aesculus hippocastanum*	64	*Aesculus hippocastanum*
65	*Aesculus hippocastanum*	66	*Aesculus hippocastanum*
67	*Aesculus hippocastanum*	68	*Aesculus hippocastanum*
69	*Sophora japonica*	70	*Sophora japonica*
71	*Fraxinus ornus*	72	*Gleditsia triacanthos*
73	*Platanus × hybrida*	74	*Sophora japonica*
75	*Sophora japonica*	76	*Sophora japonica*
77	*Tilia platyphyllos*	78	*Sophora japonica*
79	*Sophora japonica*	80	*Sophora japonica*
81	*Sophora japonica*	82	*Fraxinus angustifolia subsp. pannonica*
83	*Populus nigra* 'Italica'	84	*Populus × canadensis*
85	*Acer negundo*	86	*Acer negundo*
87	*Populus × canadensis*	88	*Populus × canadensis*
89	*Populus × canadensis*	90	*Acer negundo*
91	*Koelreuteria paniculata*	92	*Celtis occidentalis*
93	*Celtis occidentalis*	94	*Koelreuteria paniculata*
95	*Koelreuteria paniculata*	96	*Populus nigra* 'Italica'
97	*Populus nigra* 'Italica'	98	*Acer campestre*
99	*Tilia platyphyllos*	100	*Koelreuteria paniculata*
101	*Fraxinus angustifolia subsp. pannonica*	102	*Fraxinus angustifolia subsp. pannonica*
103	*Ailanthus altissima*	104	*Ailanthus altissima*
105	*Fraxinus angustifolia subsp. pannonica*	106	*Fraxinus angustifolia subsp. pannonica*
107	*Fraxinus angustifolia subsp. pannonica*	108	*Fraxinus angustifolia subsp. pannonica*

109	*Fraxinus angustifolia subsp. pannonica*	110	*Fraxinus angustifolia subsp. pannonica*
111	*Fraxinus angustifolia subsp. pannonica*	112	*Fraxinus angustifolia subsp. pannonica*
113	*Fraxinus angustifolia subsp. pannonica*	114	*Pinus nigra*
115	*Pinus nigra*	116	*Pinus nigra*
117	*Pinus nigra*	118	*Populus × canadensis*
119	*Populus × canadensis*	120	*Tilia cordata*
121	*Tilia cordata*	122	*Tilia cordata*
123	*Prunus cerasifera* 'Atropurpurea'	124	*Sorbus aria*
125	*Fraxinus angustifolia subsp. pannonica*	126	*Fraxinus angustifolia subsp. pannonica*
127	*Fraxinus angustifolia subsp. pannonica*	128	*Fraxinus angustifolia subsp. pannonica*
129	*Fraxinus angustifolia subsp. pannonica*	130	*Fraxinus angustifolia subsp. pannonica*
131	*Fraxinus angustifolia subsp. pannonica*	132	*Fraxinus angustifolia subsp. pannonica*
133	*Fraxinus angustifolia subsp. pannonica*	134	*Fraxinus angustifolia subsp. pannonica*
135	*Fraxinus angustifolia subsp. pannonica*	136	*Fraxinus angustifolia subsp. pannonica*
137	*Fraxinus angustifolia subsp. pannonica*	138	*Fraxinus angustifolia subsp. pannonica*
139	*Fraxinus angustifolia subsp. pannonica*	140	*Fraxinus angustifolia subsp. pannonica*
141	*Fraxinus angustifolia subsp. pannonica*	142	*Populus × canadensis*
143	*Populus × canadensis*	144	*Fraxinus angustifolia subsp. pannonica*
145	*Fraxinus angustifolia subsp. pannonica*	146	*Fraxinus angustifolia subsp. pannonica*
147	*Fraxinus angustifolia subsp. pannonica*	148	*Fraxinus angustifolia subsp. pannonica*
149	*Fraxinus angustifolia subsp. pannonica*	150	*Fraxinus angustifolia subsp. pannonica*
151	*Fraxinus angustifolia subsp. pannonica*	152	*Fraxinus angustifolia subsp. pannonica*
153	*Fraxinus angustifolia subsp. pannonica*	154	*Picea abies*

155	*Acer negundo*	156	*Platanus × hybrida*
157	*Robinia pseudoacacia*	158	*Robinia pseudoacacia*
159	*Robinia pseudoacacia*	160	*Robinia pseudoacacia*
161	*Robinia pseudoacacia*	162	*Robinia pseudoacacia*
163	*Robinia pseudoacacia*	164	*Robinia pseudoacacia*
165	*Robinia pseudoacacia*	166	*Robinia pseudoacacia*
167	*Fraxinus sp.*	168	*Fraxinus sp.*
169	*Fraxinus sp.*	170	*Fraxinus sp.*
171	*Fraxinus sp.*	172	*Fraxinus sp.*
173	*Robinia pseudoacacia*	174	*Robinia pseudoacacia*
175	*Robinia pseudoacacia*	176	*Populus sp.*
177	*Populus sp.*	178	*Populus sp.*
179	*Populus sp.*	180	*Tilia tomentosa*
181	*Robinia pseudoacacia*	182	*Sophora japonica*
183	*Populus sp.*	184	*Populus sp.*
185	*Populus sp.*	186	*Acer saccharinum*
187	*Populus sp.*	188	*Populus sp.*
189	*Populus sp.*	190	*Populus sp.*
191	*Acer saccharinum*	192	*Acer saccharinum*
193	*Ulmus sp.*	194	*Ulmus sp.*
195	*Ulmus sp.*	196	*Aesculus hippocastanum*
197	*Picea abies*	198	*Picea abies*
199	*Aesculus sp.*	200	*Acer saccharinum*
201	*Fraxinus sp.*	202	*Fraxinus sp.*
203	*Picea pungens*	204	*Picea pungens* 'Koster'
205	*Picea abies*	206	*Picea abies*
207	*Fraxinus ornus*	208	*Platanus × hybrida*
209	*Aesculus × carnea*	210	*Aesculus × carnea*
211	*Aesculus × carnea*	212	*Aesculus × carnea*
213	*Fraxinus sp.*	214	*Picea pungens*

215	*Gleditsia triacanthos*	216	*Fraxinus sp.*
217	*Prunus sp.*	218	*Abies sp.*
219	*Acer platanoides*	220	*Fraxinus sp.*
221	*Fraxinus sp.*	222	*Fraxinus sp.*
223	*Pinus sylvestris*	224	*Pinus sylvestris*
225	*Pinus sylvestris*	226	*Pinus sylvestris*
227	*Pinus sylvestris*	228	*Taxus baccata*
229	*Taxus baccata*	230	*Taxus beccata*
231	*Taxus beccata*	232	*Abies sp.*
233	*Abies sp.*	234	*Abies sp.*
235	*Picea abies*	236	*Picea abies*
237	*Aesculus sp.*	238	*Aesculus sp.*
239	*Acer campestre*	240	*Fraxinus sp.*
241	*Fraxinus sp.*	242	*Acer pseudoplatanus*
243	*Prunus sp.*	244	*Prunus cerasifera* 'Nigra'
245	*Prunus sp.*	246	*Robinia pseudoacacia*
247	*Fraxinus sp.*	248	*Picea abies*
249	*Fraxinus sp.*	250	*Sorbus sp.*
251	*Betula pendula*	252	*Picea abies*
253	*Fraxinus sp.*	254	*Picea abies*
255	*Picea pungens*	256	*Betula pendula*
257	*Betula pendula*	258	*Corylus columa*
259	*Robinia pseudoacacia*	260	*Picea abies*
261	*Prunus laurocerasus*	262	*Viburnum lantana*
263	*Viburnum rhytidophyllum*	264	*Forsythia × intermedia*
265	*Ligustrum vulgare*	266	*Lycium barbarum*
267	*Syringa vulgaris*	268	*Ulmus sp.*
269	*Abies sp.*	270	*Abies sp.*
271	*Robinia pseudoacacia*	272	*Juniperus sp.*
273	*Fraxinus sp.*	274	*Fraxinus sp.*

275	*Juniperus sp.*	276	*Acer campestre*
277	*Juniperus sp.*	278	*Juniperus sp.*
279	*Juniperus sp.*	280	*Picea abies*
281	*Picea pungens*	282	*Populus nigra* 'Italica'
283	*Pinus nigra*	284	*Pinus nigra*
285	*Pinus nigra*	286	*Pinus nigra*
287	*Pinus nigra*	288	*Pinus nigra*
289	*Robinia pseudoacacia*	290	*Robinia pseudoacacia*
291	*Robinia pseudoacacia*	292	*Robinia pseudoacacia*
293	*Robinia pseudoacacia*	294	*Gleditsia triacanthos*
295	*Gleditsia triacanthos*	296	*Gleditsia triacanthos*
297	*Pinus nigra*	298	*Pinus nigra*
299	*Pinus nigra*	300	*Pinus nigra*
301	*Picea abies*	302	*Aesculus hippocastanum*
303	*Picea abies*	304	*Aesculus hippocastanum*
305	*Aesculus hippocastanum*	306	*Aesculus hippocastanum*
307	*Aesculus hippocastanum*	308	*Populus sp.*
309	*Populus sp.*	310	*Picea abies*
311	*Picea abies*	312	*Picea abies*

04 Szent Imre Hospital shrub and herbaceous survey table (Source: by author)

Number	Latin name	Area (m^2)
Shurb		
1	*Berberis thunbergii*	18
2	*Berberis thunbergii* 'Atropurpurea'	40
3	*Cotoneaster microphyllus*	133
4	*Hypericum monogynum*	40
5	*Jacobaea maritima*	13
6	*Jasminum nudiflorum*	30

7	*Juniperus sabina*	48
8	*Ligustrum obtusifolium*	66
9	*Ligustrum × vicaryi*	59
10	*Lonicera korolkowii*	156
11	*Lonicera ligustrina sp. yunnanensis*	157
12	*Mahonia fortunei*	26
13	*Nerium oleander*	37
14	*Platycladus orientalis* 'Sieboldii'	40
15	*Prunus laurocerasus*	90
16	*Pyracantha fortuneana*	52
17	*Rosa sertata*	133
18	*Spiraea × bumalda* 'Coldfiame'	82
19	*Spiraea × vanhouttei*	29
20	*Symphoricarpos sinensis*	163
21	*Taxus cuspidata* 'nana'	15
22	*Viburnum rhytidophyllum*	88
23	*Weigela florida*	42
Herbaceous		
1	*Hedera helix*	17
2	*Helictotrichon sempervirens*	20
3	*Hemerocallis fulva*	40
4	*Vinca major*	10

05 Szent János Hospital tree survey table (Source: Németh, 2008)

1	*Populus nigra*	2	*Acer platanoides*
3	*Populus alba*	4	*Acer platanoides*
5	*Acer platanoides*	6	*Acer platanoides*
7	*Acer platanoides*	8	*Acer platanoides*
9	*Betula pendula*	10	*Betula pendula*

11	*Betula pendula*	12	*Pinus nigra*
13	*Betula pendula*	14	*Betula pendula*
15	*Betula pendula*	16	*Fraxinus excelsior*
17	*Fraxinus excelsior*	18	*Fraxinus excelsior*
19	*Fraxinus excelsior*	20	*Fraxinus excelsior*
21	*Fraxinus excelsior*	22	*Fraxinus excelsior*
23	*Picea abies*	24	*Picea abies*
25	*Picea abies*	26	*Picea abies*
27	*Quercus robur*	28	*Fraxinus excelsior*
29	*Picea abies*	30	*Picea abies*
31	*Picea abies*	32	*Tilia cordata*
33	*Fraxinus excelsior*	34	*Fraxinus excelsior*
35	*Fraxinus excelsior*	36	*Fraxinus excelsior*
37	*Fraxinus excelsior*	38	*Fraxinus ornus*
39	*Pinus nigra*	40	*Sophora japonica*
41	*Pinus nigra*	42	*Pinus nigra*
43	*Pinus nigra*	44	*Pinus nigra*
45	*Pinus nigra*	46	*Pinus nigra*
47	*Pinus nigra*	48	*Pinus nigra*
49	*Pinus nigra*	50	*Pinus nigra*
51	*Pinus nigra*	52	*Pinus nigra*
53	*Pinus nigra*	54	*Fraxinus excelsior*
55	*Platanus × hybrida*	56	*Fraxinus excelsior*
57	*Acer platanoides*	58	*Acer platanoides*
59	*Acer platanoides*	60	*Acer platanoides*
61	*Acer platanoides*	62	*Acer platanoides*
63	*Pinus nigra*	64	*Pinus nigra*
65	*Acer platanoides*	66	*Acer platanoides*
67	*Pinus nigra*	68	*Acer platanoides*
69	*Pinus nigra*	70	*Pinus nigra*

71	*Pinus nigra*	72	*Acer platanoides*
73	*Pinus nigra*	74	*Pinus nigra*
75	*Pinus nigra*	76	*Pinus nigra*
77	*Prunus cerasifera*	78	*Salix alba*
79	*Pinus nigra*	80	*Acer platanoides*
81	*Acer platanoides*	82	*Aesculus hippocastanum*
83	*Cerasus avium*	84	*Cerasus avium*
85	*Acer platanoides*	86	*Pinus nigra*
87	*Pinus nigra*	88	*Pinus nigra*
89	*Pinus nigra*	90	*Pinus nigra*
91	*Platanus × hybrida*	92	*Quercus robur*
93	*Sophora japonica*	94	*Platanus × hybrida*
95	*Fraxinus excelsior*	96	*Platanus × hybrida*
97	*Picea abies*	98	*Acer platanoides*
99	*Acer platanoides*	100	*× Cupressociparis leylandii*
101	*× Cupressociparis leylandii*	102	*Fraxinus ornus*
103	*Pinus nigra*	104	*Pinus nigra*
105	*Pinus nigra*	106	*Pinus nigra*
107	*Pinus nigra*	108	*Pinus nigra*
109	*Pinus nigra*	110	*Pinus nigra*
111	*Pinus nigra*	112	*Pinus nigra*
113	*Pinus nigra*	114	*Fraxinus ornus*
115	*Ailanthus altissima*	116	*Acer platanoides*
117	*Acer negundo*	118	*Acer platanoides*
119	*Acer platanoides*	120	*Acer platanoides*
121	*Thuja orientails*	122	*Robinia pseudoakatia*
123	*Robinia pseudoakatia*	124	*Robinia pseudoakatia*
125	*Acer platanoides*	126	*Acer platanoides*
127	*Aesculus hippocastanum*	128	*Acer platanoides*
129	*Acer platanoides*	130	*Betula pendula*

131	*Acer platanoides*	132	*Thuja orientails*
133	*Ailanthus altissima*	134	*Celtis occidentalis*
135	*Celtis occidentalis*	136	*Celtis occidentalis*
137	*Celtis occidentalis*	138	*Acer platanoides*
139	*Koelreuteria paniculata*	140	*Koelreuteria paniculata*
141	*Juglans regia*	142	*Acer platanoides*
143	*Acer pseudoplatanus*	144	*Picea abies*
145	*Gleditsia tiacanthos*	146	*Acer pseudoplatanus*
147	*Acer pseudoplatanus*	148	*Picea abies*
149	*Picea abies*	150	*Pinus nigra*
151	*Pinus nigra*	152	*Pinus nigra*
153	*Cerasus avium*	154	*Pinus nigra*
155	*Pinus nigra*	156	*Pinus nigra*
157	*Fraxinus ornus*	158	*Acer platanoides*
159	*Eleagnus angustifolia*	160	*Cupressus sempevirens*
161	*Cupressus sempevirens*	162	*Cupressus sempevirens*
163	*Cupressus sempevirens*	164	*Robinia pseudoakatia*
165	*Pinus nigra*	166	*Pinus nigra*
167	*Fraxinus excelsior*	168	*Tilia cordata*
169	*Cerasus avium*	170	*Picea abies*
171	*Tilia cordata*	172	*Acer platanoides*
173	*Acer platanoides*	174	*Tilia cordata*
175	*Acer platanoides*	176	*Acer platanoides*
177	*Tilia cordata*	178	*Cerasus avium*
179	*Picea abies*	180	*Picea abies*
181	*Picea abies*	182	*Picea abies*
183	*Picea abies*	184	*Picea abies*
185	*Aesculus hippocastanum*	186	*Aesculus hippocastanum*
187	*Aesculus hippocastanum*	188	*Aesculus hippocastanum*
189	*Tilia cordata*	190	*Tilia cordata*

191	*Tilia cordata*	192	*Tilia cordata*
193	*Tilia cordata*	194	*Carpinus betulus*
195	*Picea abies*	196	*Robinia pseudoakatia*
197	*Picea abies*	198	*Picea abies*
199	*Fraxinus ornus*	200	*Picea abies*
201	*Picea abies*	202	*Fraxinus ornus*
203	*Fraxinus ornus*	204	*Fraxinus excelsior*
205	*Fraxinus excelsior*	206	*Pinus nigra*
207	*Pinus nigra*	208	*Picea abies*
209	*Pinus nigra*	210	*Platanus × hybrida*
211	*Picea abies*	212	*Picea abies*
213	*Picea abies*	214	*Picea pungens*
215	*Picea abies*	216	*Thuja orientalis*
217	*Thuja orientalis*	218	*Picea abies*
219	*Thuja orientalis*	220	*Picea pungens*
221	*Thuja orientalis*	222	*Sophora japonica*
223	*Sophora japonica* 'Pendula'	224	*Sophora japonica*
225	*Thuja orientalis*	226	*Picea pungens*
227	*Picea pungens*	228	*Thuja orientalis*
229	*Thuja orientalis*	230	*Sophora japonica* 'Pendula'
231	*Pseudotsuga menziesii*	232	*Pseudotsuga menziesii*
233	*Picea pungens*	234	*Pseudotsuga menziesii*
235	*Sophora japonica*	236	*Pseudotsuga menziesii*
237	*Fraxinus excelsior*	238	*Pinus sylvestris*
239	*Pinus sylvestris*	240	*Acer negundo*
241	*Betula pendula*	242	*Betula pendula*
243	*Acer panoides* 'Krimson King'	244	*Acer platanoides*
245	*Acer platanoides*	246	*Acer platanoides*
247	*Acer negundo*	248	*Aesculus hippocastanum*
249	*Picea abies*	250	*Picea abies*

251	*Picea abies*	252	*Picea abies*
253	*Picea abies*	254	*Picea abies*
255	*Picea abies*	256	*Picea abies*
257	*Pinus sylvestris*	258	*Acer platanoides*
259	*Fraxinus excelsior*	260	*Pinus sylvestris*
261	*Tilia cordata*	262	*Pinus sylvestris*
263	*Acer platanoides*	264	*Pinus nigra*
265	*Aesculus hippocastanum*	266	*Acer platanoides*
267	*Acer platanoides*	268	*Acer platanoides*
269	*Betula pendula*	270	*Betula pendula*
271	*Betula pendula*	272	*Acer negundo*
273	*Aesculus hippocastanum*	274	*Aesculus hippocastanum*
275	*Aesculus hippocastanum*	276	*Fraxinus excelsior*
277	*Fraxinus excelsior*	278	*Fraxinus excelsior*
279	*Fraxinus excelsior*	280	*Quercus robur*
281	*Aesculus hippocastanum*	282	*Populus nigra* 'Italica'
283	*Picea abies*	284	*Picea abies*
285	*Picea abies*	286	*Picea abies*
287	*Picea abies*	288	*Picea abies*
289	*Picea abies*	290	*Picea abies*
291	*Aesculus hippocastanum*	292	*Platanus × hybrida*
293	*Populus nigra* 'Italica'	294	*Populus nigra* 'Italica'
295	*Populus nigra* 'Italica'	296	*Populus nigra* 'Italica'
297	*Populus nigra* 'Italica'	298	*Populus nigra* 'Italica'
299	*Populus nigra* 'Italica'	300	*Populus nigra* 'Italica'
301	*Populus nigra* 'Italica'	302	*Populus nigra* 'Italica'
303	*Fraxinus excelsior*	304	*Fraxinus excelsior*
305	*Fraxinus excelsior*	306	*Aesculus hippocastanum*
307	*Aesculus hippocastanum*	308	*Picea pungens*
309	*Picea pungens*	310	*Aesculus hippocastanum*

311	*Aesculus hippocastanum*	312	*Populus nigra* 'Italica'
313	*Populus nigra* 'Italica'	314	*Populus nigra* 'Italica'
315	*Populus nigra* 'Italica'	316	*Populus nigra* 'Italica'
317	*Populus nigra* 'Italica'	318	*Populus nigra* 'Italica'
319	*Populus nigra* 'Italica'	320	*Populus nigra* 'Italica'
321	*Populus nigra* 'Italica'	322	*Populus nigra* 'Italica'
323	*Acer negundo*	324	*Fraxinus ornus*
325	*Betula pendula*	326	*Betula pendula*
327	*Betula pendula*	328	*Betula pendula*
329	*Tilia cordata*	330	*Tilia cordata*
331	*Tilia cordata*	332	*Tilia cordata*
333	*Tilia cordata*	334	*Tilia cordata*
335	*Tilia cordata*	336	*Tilia cordata*
337	*Tilia cordata*	338	*Tilia cordata*
339	*Tilia cordata*	340	*Tilia cordata*
341	*Aesculus hippocastanum*	342	*Aesculus hippocastanum*
343	*Aesculus hippocastanum*	344	*Aesculus hippocastanum*
345	*Aesculus hippocastanum*	346	*Aesculus hippocastanum*
347	*Aesculus hippocastanum*	348	*Aesculus hippocastanum*
349	*Aesculus hippocastanum*	350	*Aesculus hippocastanum*
351	*Acer platanoides*	352	*Cupressus sempevirens*
353	*Acer platanoides*	354	*Platanus × hybrida*
355	*Platanus × hybrida*	356	*Picea abies*
357	*Picea abies*	358	*Picea abies*
359	*Picea abies*	360	*Picea abies*
361	*Fraxinus excelsior*	362	*Picea abies*
363	*Picea abies*	364	*Picea abies*
365	*Picea abies*	366	*Picea abies*
367	*Larix decidua*	368	*Quercus robur*
369	*Robinia pseudoakatia*	370	*Tilia cordata*

371	*Tilia cordata*	372	*Fraxinus excelsior*
373	*Quercus robur*	374	*Tilia cordata*
375	*Eleagnus angustifolia*	376	*Populus nigra* 'Italica'
377	*Tilia cordata*	378	*Populus nigra* 'Italica'
379	*Fraxinus excelsior*	380	*Acer negundo*
381	*Fraxinus excelsior*	382	*Fraxinus excelsior*
383	*Tilia cordata*	384	*Fraxinus excelsior*
385	*Prunus cerasifera*	386	*Prunus cerasifera*
387	*Prunus cerasifera*	388	*Prunus cerasifera*
389	*Prunus cerasifera*	390	*Prunus cerasifera*
391	*Prunus cerasifera*	392	*Prunus cerasifera*
393	*Prunus cerasifera*	394	*Picea abies*
395	*Picea abies*	396	*Picea abies*
397	*Picea abies*	398	*Fraxinus excelsior*
399	*Fraxinus excelsior*	400	*Acer platanoides*
401	*Cerasus avium*	402	*Tilia cordata*
403	*Prunus cerasifera*	404	*Prunus cerasifera*
405	*Tilia cordata*	406	*Prunus cerasifera*
407	*Acer platanoides* 'Kimson King'	408	*Acer platanoides* 'Kimson King'
409	*Acer platanoides* 'Kimson King'	410	*Koelreuteria paniculata*
411	*Picea abies*	412	*Picea abies*
413	*Picea abies*	414	*Picea abies*
415	*Cupressus sempervirens*	416	*Picea pungens*
417	*Picea pungens*	418	*Picea abies*
419	*Picea abies*	420	*Acer negundo*
421	*Picea pungens*	422	*Picea abies*
423	*Picea pungens*	424	*Acer platanoides*
425	*Picea abies*	426	*Abies concolor*
427	*Acer negundo*	428	*Acer pseudoplatanus*
429	*Acer negundo*	430	*Picea abies*

431	*Acer pseudoplatanus*	432	*Cerasus avium*
433	*Acer pseudoplatanus*	434	*Acer platanoides*
435	*Betula pendula*	436	*Betula pendula*
437	*Pseudotsuga menziesii*	438	*Pseudotsuga menziesii*
439	*Fraxinus excelsior*	440	*Acer negundo*
441	*Acer negundo*	442	*Acer platanoides*
443	*Pseudotsuga menziesi*	444	*Pseudotsuga menziesi*
445	*Pseudotsuga menziesii*	446	*Acer negundo*
447	*Fraxinus excelsior*	448	*Pseudotsuga menziesii*
449	*Pseudotsuga menziesi*	450	*Pseudotsuga menziesi*
451	*Acer plataoides*	452	*Acer plataoides*
453	*Betula pendula*	454	*Betula pendula*
455	*Acer plataoides*	456	*Tilia cordata*
457	*Tilia cordata*	458	*Tilia cordata*
459	*Acer sacharinum*	460	*Robinia pseudoakatia*
461	*Robinia pseudoakatia*	462	*Robinia pseudoakatia*
463	*Betula pendula*	464	*Picea pungens*
465	*Pseudotsuga menziesii*	466	*Pseudotsuga menziesii*
467	*Pseudotsuga menziesii*	468	*Betula pendula*
469	*Betula pendula*	470	*Betula pendula*
471	*Crataegus laevigata* 'Paul's Scarlet'	472	*Crataegus laevigata* 'Paul's Scarlet'
473	*Acer platanoides* 'Krimson King'	474	*Tilia cordata*
475	*Tilia cordata*	476	*Robinia pseudoakatia*
477	*Pseudotsuga menziesii*	478	*Robinia pseudoakatia*
479	*Robinia pseudoakatia*	480	*Robinia pseudoakatia*
481	*Robinia pseudoakatia*	482	*Acer platanoides* 'Krimson King'
483	*Betula pendula*	484	*Populus nigra* 'Italica'
485	*Populus nigra* 'Italica'	486	*Populus nigra* 'Italica'
487	*Carpinus betulus*	488	*Carpinus betulus*

489	*Robinia pseudoakatia*	490	*Crataegus laevigata 'Paul's Scarlet'*
491	*Crataegus laevigata* 'Paul's Scarlet'	492	*Tilia cordata*
493	*Betula pendula*	494	*Betula pendula*
495	*Betula pendula*	496	*Betula pendula*
497	*Tilia cordata*	498	*Platanus × hybrida*
499	*Betula pendula*	500	*Acer plataoides*
501	*Betula pendula*	502	*Acer platanoides* 'Krimson King'
503	*Sophora japonica*	504	*Crataegus laevigata* 'Paul's Scarlet'
505	*Carpinus betulus*	506	*Carpinus betulus*
507	*Platanus × hybrida*	508	*Catalpa bignoides*
509	*Pseudotsuga menziesii*	510	*Pseudotsuga menziesii*
511	*Acer plataoides*	512	*Pseudotsuga menziesii*
513	*Acer platanoides* 'Krimson King'	514	*Platanus × hybrida*
515	*Acer platanoides* 'Krimson King'	516	*Thuja orientalis*
517	*Thuja orientalis*	518	*Thuja orientalis*
519	*Thuja orientalis*	520	*Thuja orientalis*
521	*Thuja orientalis*	522	*Catalpa bignoides*
523	*Acer platanoides*	524	*Picea pungens*
525	*Acer platanoides* 'Krimson King'	526	*Acer platanoides* 'Krimson King'
527	*Catalpa bignoides*	528	*Picea abies*
529	*Picea abies*	530	*Picea abies*
531	*Pseudotsuga menziesii*	532	*Taxus baccata*
533	*Fraxinus ornus*	534	*Pseudotsuga menziesii*
535	*Acer platanoides*	536	*Acer platanoides*
537	*Acer platanoides*	538	*Acer platanoides*
539	*Platanus × hybrida*	540	*Tilia cordata*
541	*Tilia cordata*	542	*Fraxinus excelsior*
543	*Acer platanoides*	544	*Acer platanoides*
545	*Tilia cordata*	546	*Tilia cordata*

547	*Tilia cordata*	548	*Tilia cordata*
549	*Corylus colurna*	550	*Acer platanoides*
551	*Tilia cordata*	552	*Platanus × hybrida*
553	*Acer platanoides*	554	*Corylus colurna*
555	*Corylus colurna*	556	*Acer platanoides*
557	*Acer platanoides*	558	*Catalpa bignoides*
559	*Catalpa bignoides*	560	*Platanus × hybrida*
561	*Picea abies*	562	*Picea abies*
563	*Picea abies*	564	*Picea abies*
565	*Picea abies*	566	*Betula pendula*
567	*Acer plataoides*	568	*Acer plataoides*
569	*Tilia cordata*	570	*Tilia cordata*
571	*Picea abies*	572	*Acer platanoides*
573	*Crataegus laevigata* 'Paul's Scarlet'	574	*Fraxinus ornus*
575	*Catalpa bignoides*	576	*Picea abies*
577	*Picea abies*	578	*Picea abies*
579	*Picea abies*	580	*Corylus colurna*
581	*Picea abies*	582	*Tilia cordata*
583	*Picea abies*	584	*Betula pendula*
585	*Betula pendula*	586	*Betula pendula*
587	*Betula pendula*	588	*Tilia cordata*
589	*Betula pendula*	590	*Betula pendula*
591	*Picea abies*	592	*Cerasus serulata* 'Kiku-Shidare-Sakura'
593	*Pseudotsuga menziesii*	594	*Thuja orientalis*
595	*Acer platanoides*	596	*Picea abies*
597	*Picea pungens*	598	*Picea pungens*
599	*Picea pungens*	600	*Picea pungens*
601	*Picea abies*	602	*Pseudotsuga menziesii*
603	*Pseudotsuga menziesii*	604	*Pseudotsuga menziesii*

605	*Platanus × hybrida*	606	*Picea abies*
607	*Platanus × hybrida*	608	*Crataegus laevigata* 'Paul's Scarlet'
609	*Picea abies*	610	*Picea abies*
611	*Platanus × hybrida*	612	*Acer platanoides*
613	*Platanus × hybrida*	614	*Fraxinus ornus*
615	*Fraxinus excelsior*	616	*Acer platanoides*
617	*Cerasus avium*	618	*Cerasus avium*
619	*Cerasus avium*	620	*Prunus cerasifera*
621	*Fraxinus ornus*	622	*Koelreuteria paniculata*
623	*Picea abies*	624	*Acer platanoides*
625	*Pseudotsuga menziesii*	626	*Corylus colurna*
627	*Corylus colurna*	628	*Aesculus hippocastanum*
629	*Acer platanoides*	630	*Robinia pseudoakatia*
631	*Robinia pseudoakatia*	632	*Tilia cordata*
633	*Salix alba*	634	*Tilia cordata*
635	*Tilia cordata*	636	*Tilia cordata*
637	*Sophora japonica*	638	*Prunus cerasifera*
639	*Crataegus laevigata* 'Paul's Scarlet'	640	*Fraxinus ornus*
641	*Sophora japonica*	642	*Prunus cerasifera*
643	*Tilia cordata*	644	*Platanus × hybrida*
645	*Cerasus avium*	646	*Betula pendula*

06 Szent János Hospital shrub and herbaceous survey table (Source: by author)

Number	Latin name	Area (m^2)
Shurb		
1	*Berberis julianae*	36
2	*Chamaecyparis pisifera* 'Filifera Nana'	18
3	*Cotoneaster microphyllus*	21
4	*Deutzia scabra*	50

5	*Forsythia suspensa*	199
6	*Hibiscus syriacus*	181
7	*Hydrangea macrophylla*	27
8	*Juniperus squamata* 'Blue Carpet'	70
9	*Ligustrum obtusifolium*	36
10	*Ligustrum × vicaryi*	56
11	*Lonicera ligustrina sp. yunnanensis*	201
12	*Philadelphus coronarius*	24
13	*Prunus laurocerasus*	29
14	*Prunus obtusata*	48
15	*Pyracantha fortuneana*	277
16	*Rosa sertata*	91
17	*Salvia rosmarinus*	23
18	*Spiraea × vanhouttei*	236
19	*Syringa vulgaris*	124
20	*Taxus cuspidata* 'Nana'	34
21	*Ulmus davidiana var. japonica*	60
22	*Viburnum melanocarpum*	55
23	*Viburnum opulus*	37
24	*Yucca filamentosa*	32
Herbaceous		
1	*Hedera helix*	370
2	*Hemerocallis fulva*	25
3	*Iris tectorum*	29
4	*Vinca major*	23
Climbing Plants		
1	*Parthenocissus tricuspidata*	78

07 Hospital landscape evaluation questionnaire - To people in hospital (Source: by author)

Statisztikai kérdőív a kórház tájképének megítéléséről

Kedves Hölgyem/ Uram!
Üdvözlöm! Szeretnénk kérni Önt, hogy járuljon hozzá a válaszával a kutatásunkhoz, annak érdekében, hogy a kórháznak jó kültéri környezetet tervezhessünk és felépíthessük egy hatékony rendszert a kórház zöld felületeinek a megítélésére.
A segítségéért nagyon hálásak vagyunk Önnek!

Általános kérdések:

1、Az Ön neme:

A、Férfi
B、Nő

2、Az Ön életkora:

A、18-25
B、26-35
C、36-45
D、45-60
E、60 év fölötti.

3、A kórházban való tartózkodásának oka:

A、Vizsgálat/ Kezelés
B、Látogatás
C、Munkavégzés
D、Egyéb

二、Kérem válassza azt a lehetőséget, amelyik Ön szerint a legjobban illik ennek a kórháznak a jelenlegi környezetére:

1、Mennyire elégedett a kórház kültereivel, zöldfelületeivel?

A、Teljesen elégedett
B、Közepesen elégedett
C、Elégedetlen

2、Milyen tevékenységeket végezne szívesen a kórház kertjében?

A、Társalgás, csevely
B、Üldögélés és a kilátás csodálása
C、Séta
D、Kültéri fitnesz, testmozgás
E、Egyéb

3、Véleménye szerint a kórház növényes zöldterületei megfelelnek az Ön igényeinek a jelenlegi állapotban?

A、 A nyitott terek és a zártabb, személyes terek is teljesen megfelelnek az igényeimnek.

B、Közepesen felelnek meg, kevés a nyitott tér és a zárt terek nem elég privátak.

C、Nem felelnek meg, a terek nem elég változatosak.

4、Mit gondol Ön a kórház zöldfelületeinek arányáról, térbeli léptékéről?

A、Nagyon jó, a növények aránya a környező épületekhez képest megfelelő és a terek haszn á lata kényelmes.

B、Közepesen jó, néhány zöldfelület kissé lehangoló vagy üres.

C、Nem jó, a legtöbb zöldfelület lehangoló vagy üres.

5、Mi a véleménye a növények által alkotott környezet fényviszonyairól, a korház udvarán ?

A、Nagyon jó, nyáron árnyékkal és télen kellemes napsütéssel.

B、Közepesen jó, nyáron nem megfelelően árnyékos, esetleg télen kissé sötét.

C、Nem jó, nyáron túl napos vagy télen teljesen sötét.

6、Az Ön véleménye szerint milyen a hallható környezete a kültéri zöldfelületeknek?

A、Nagyon jó, a külső környezetnek kellemes madárcsicsergés vagy víz hangja van, a csend aránya is megfelelő.

B、Közepesen jó, a külső környezetből hiányzik a madárcsicsergés vagy a víz hangja, a csend aránya átlagos.

C、Nem jó, a külső környezet zajos, hiányzik a csend.

7、Mit gondol, ebben a korházban mennyire biztonságosak a kültéri növények?

A、Nagyon biztonságosak, nincsenek mérgező vagy tüskés növények.

B、Közepesen biztonságos, néhány mérgező vagy tüskés növénnyel, de ezek aránya kicsi.

C、Nem biztonságos, nagy számban vannak jelen tüskés vagy mérgező növények.

8、Hogyan vélekedik Ön a kórházi növények váltakozásáról, évszakos színváltozásairól?

A、A növények időszakos váltakozása egyértelmű, minden évszak tájképe kellemes és színekben gazdag.

B、A növényeket átlagosan változtatják, néhány évszakban nem annyira kellemes és szembetűnő a látvány.

C、Az évszakok váltakozása nem észrevehető, a táj látványa nem vonzó, a színek egyhangúak.

9、Mit gondol Ön a kórház kültereiben a növények rétegződéséről?

A、Nagyon jó, sok a változóan magas növény, emiatt szépnek hat.

B、Közepesen jó, a növények egy része magas, de a nem hat dúsnak, gazdagnak.

C、Nem jó, általában csak fű van vagy fa, egysíkú.

10、Mit gondol, mekkora a zöldfelületek aránya a kórház udvarában?

A、Jó a zöld lefedettség, a látvány több mint 50%-a növényekből áll.

B、Közepes a zöld lefedettség, a látvány 20%-50%-a áll növényekből.

C、Rossz a zöld lefedettség, a látvány kevesebb mint 20%-át teszik ki növények.

11、Mi az Ön véleménye a kórház kültéri növényeinek a díszítő erejéről?

A、Formákban és színekben gazdag levélzet, virágok, termések, váltakozó formájú ágak és törzsek, többféle tulajdonságú növények vannak.

B、Közepesen változatos formájú és színű levelek, virágok, termések, ágak és törzsek vannak, nem elég játékos.

C、Nem változatos. A levelek, virágok, termések, ágak és törzsek formái, színei egyhangúak.

12、Mit gondol Ön az illatos, aromás növények telepítettségéről?

A、Nagyon jó, a korházi udvar teljes területén megtalálhatóak aromás növények.

B、Közepesen jó, csak néhány helyen tömörülnek az aromás növények.

C、Nem jó, szinte egyáltalán nem találkozhatunk aromás növényekkel.

13、Mit gondol az ehető növények telepítettségéről a kórház udvarán belül?

A、Nagyon jó, a teljes kórház területén gazdagon jelen vannak különböző ehető növények.

B、Közepesen jó, csak néhány helyen találkozhatunk ehető növényekkel, és ezek nem sokfélék.

C、Nem jó, szinte semelyik növény nem ehető.

14. Hogyan vélekedik a különleges tapintású növények telepítettségéről a kórházi udvarban?

A、Nagyon jó, sokféle különleges tapintású növény van a kórházi udvar teljes területén.

B、Közepesen jó, csak kevés helyen találhatóak különleges tapintású növények, kevés fajta van.

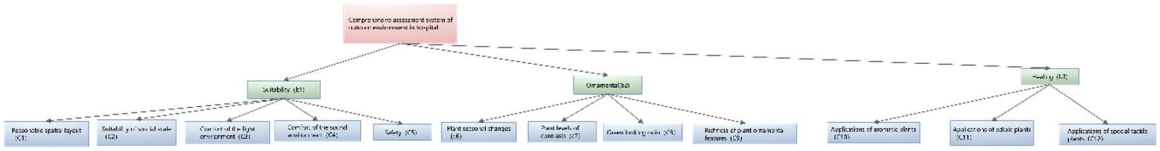
C、Nem jó, szinte sehol nincsenek különleges tapintású növények az udvarban.

08 Hospital landscape evaluation questionnaire - To experts (Source: by author)

Hospital Plant Landscape Indicator Relative Importance Questionnaire

The purpose of this questionnaire is to **determine the relative weights between the various influencing factors** of hospital plant landscape. The questionnaire is designed according to a form of Analytic Hierarchy Process (AHP). This method involves comparing the effects of the importance of two factors at the same level.
You can slide the indicator bar to express how important these two factors are to the upper level(The corresponding upper level factors are mentioned in each question), with **100 is extremely important, 80 is very important, 60 is relatively important, 50 is equally important, 40 is relatively unimportant, 20 is less important and 0 is not important at all.**

This evaluation will have three layers with the following model information:



Goal layer （a）	Guideline layer （b）	Object layer （c）
Comprehensive assessment system of outdoor environment in hospital	Suitability （b_1）	Reasonable spatial layout （c_1）
		Suitability of spatial scale （c_2）
		Comfort of the light environment （c_3）
		Comfort of the sound environment （c_4）
		Safety （c_5）
	Ornamental(b_2)	Plant seasonal changes （c_6）
		Plant levels of contrasts （c_7）
		Green looking ratio （c_8）
		Richness of plant ornamental features （c_9）
	Healing （b_3）	Applications of aromatic plants （c_{10}）
		Applications of edible plants （c_{11}）
		Applications of special tactile plants （c_{12}）

Instructions

Reasonable spatial layout（c1）： Whether have a variety of spaces. e.g. open space; Private space; Semi-open space

Suitability of spatial scale（c2）： Proportion of plants to surroundings, e.g. empty / depressing / comfortable

Comfort of the light environment（c3）： Mainly sunlight

Comfort of the sound environment（c4）： Level of quietness, whether it contains comforting sounds, e.g. birdsong, water

Safety（c5）： Poisonous and thorny plants

Plant levels of contrasts（c7）： Whether different levels of plants are applied or just trees and grasses.

Green looking ratio（c8）： Degree of green in the field of view

Richness of plant ornamental features（c9）： include whether have an abundance of shapes and colours, leaves, flowers, fruits, branches and trunk features.

1. For a comprehensive assessment system of the hospital outdoor environment, please compare the importance of Suitability（b1) and Ornamental(b2). [Specific gravity question]

Suitability（b1)_____
Ornamental(b2)_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

2. For a comprehensive assessment system of the hospital outdoor environment, please compare the importance of Suitability（b1) and Healing（b3). [Specific gravity question]

Suitability（b1)_____
Healing（b3)_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

3. For a comprehensive assessment system of the hospital outdoor environment, please compare the importance of Ornamental(b2) and Healing（b3). [Specific gravity question]

Ornamental(b2)_____
Healing（b3)_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

Assess the relative importance of the following indicators to 'Suitability'

Suitability（b_1)	Reasonable spatial layout（c_1)
	Suitability of spatial scale（c_2)
	Comfort of the light environment（c_3)
	Comfort of the sound environment（c_4)
	Safety（c_5)

4. For Suitability（b1), please compare the importance of Reasonable spatial layout （C1）and Suitability of spatial scale（C2）. [Specific gravity question]

Reasonable spatial layout（C1）_____
Suitability of spatial scale（C2）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

5. For Suitability（b1), please compare the importance of Reasonable spatial layout （C1） and Comfort of the light environment（C3）. [Specific gravity question]

Reasonable spatial layout（C1）_____
Comfort of the light environment（C3）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

6.For Suitability（b1), please compare the importance of Reasonable spatial layout （C1） and Comfort of the sound environment（C4）. [Specific gravity question]

Reasonable spatial layout（C1）_____
Comfort of the sound environment（C4）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

7.For Suitability（b1), please compare the importance of Reasonable spatial layout （C1） and Safety（C5）. [Specific gravity question]

Reasonable spatial layout（C1）_____
Safety（C5）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

8.For Suitability（b1), please compare the importance of Suitability of spatial scale（C2） and Comfort of the light environment（C3）. [Specific gravity question]

Suitability of spatial scale（C2）_____
Comfort of the light environment（C3）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

9.For Suitability（b1), please compare the importance of Suitability of spatial scale（C2） and Comfort of the sound environment（C4）. [Specific gravity question]

Suitability of spatial scale（C2）_____
Comfort of the sound environment（C4）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

10.For Suitability（b1), please compare the importance of Suitability of spatial scale （C2） and Safety（C5）. [Specific gravity question]

Suitability of spatial scale（C2）_____
Safety（C5）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

11.For Suitability（b1), please compare the importance of Comfort of the light environment（C3） 和 Comfort of the sound environment（C4）. [Specific gravity question]

Comfort of the light environment（C3）_____
Comfort of the sound environment（C4）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

12.For Suitability（b1), please compare the importance of Comfort of the light environment（C3） 和 Safety（C5）. [Specific gravity question]

Comfort of the light environment（C3）_____
Safety（C5）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

13.For Suitability（b1), please compare the importance of Comfort of the sound environment（C4） 和 Safety（C5）. [Specific gravity question]

Comfort of the sound environment（C4）_____
Safety（C5）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

Assess the relative importance of the following indicators for 'Ornamental'

Ornamental(b_2)	Plant seasonal changes（c_6)
	Plant levels of contrasts（c_7)
	Green looking ratio（c_8)
	Richness of plant ornamental features（c_9)

14.For Ornamental(b2), please compare the importance of Plant seasonal changes（C6） and Plant levels of contrasts（C7）. [Specific gravity question]

Plant seasonal changes（C6）_____
Plant levels of contrasts（C7）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

15.For Ornamental(b2), please compare the importance of Plant seasonal changes（C6） and Green looking ratio（C8）. [Specific gravity question]

Plant seasonal changes（C6）_____
Green looking ratio（C8）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

16.For Ornamental(b2), please compare the importance of Plant seasonal changes （C6） and Richness of plant ornamental features（C9）. [Specific gravity question]

Plant seasonal changes（C6）_____
Richness of plant ornamental features（C9）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

17.For Ornamental(b2), please compare the importance of Plant levels of contrasts （C7） and Green looking ratio（C8）. [Specific gravity question]

Plant levels of contrasts（C7）_____
Green looking ratio（C8）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

18.For Ornamental(b2), please compare the importance of Plant levels of contrasts （C7） and Richness of plant ornamental features（C9）. [Specific gravity question]

Plant levels of contrasts（C7）_____
Richness of plant ornamental features（C9）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

19.For Ornamental(b2), please compare the importance of Green looking ratio（C8） and Richness of plant ornamental features（C9）. [Specific gravity question]

Green looking ratio（C8）_____
Richness of plant ornamental features（C9）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

Assess the relative importance of the following indicators for “Healing”

Healing（b_3）	Applications of aromatic plants（c_{10}）
	Applications of edible plants（c_{11}）
	Applications of special tactile plants（c_{12}）

20.For Healing（b3), please compare the importance of Applications of aromatic plants （C10） and Applications of edible plants（C11）. [Specific gravity question]

Applications of aromatic plants（C10）_____
Applications of edible plants（C11）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

21.For Healing（b3), please compare the importance of Applications of aromatic plants （C10） and Applications of special tactile plants（C12）. [Specific gravity question]

Applications of aromatic plants（C10）_____

Applications of special tactile plants（C12）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

22.For Healing（b3), please compare the importance of Applications of edible plants （C11） and Applications of special tactile plants（C12）. [Specific gravity question]

Applications of edible plants（C11）_____

Applications of special tactile plants（C12）_____

Hint: Please fill in the numbers, the sum of all items must be equal to 100

If you have any comments or advice, you are also very welcome to write it here, your guidance would be greatly valued! [fill in the blank]

_____

09 Recommended plant list (Source: *Find a Plant | North Carolina Extension Gardener Plant Toolbox*, n.d.)

Aromatic and Fragrant Plants	
Tree	
1	*Calocedrus decurrens*
2	*Cupressus arizonica*
3	*Magnolia × soulangeana*
4	*Magnolia denudata*
5	*Magnolia grandiflora*
6	*Magnolia kobus*
7	*Prunus* 'Spire' (*Prunus × hillieri* 'Spire')
8	*Prunus cerasifera* 'Nigra'
9	*Prunus padus*
10	*Prunus padus* 'Albertii'
11	*Prunus padus* 'Nana'
12	*Prunus padus* 'Watereri'
13	*Prunus serrulata* 'Amanogawa'
14	*Prunus × yedoensis*
15	*Pseudotsuga menziesii*
16	*Sorbus intermedia*
17	*Sorbus intermedia* 'Brouwers'
18	*Thuja plicata* 'Zebrina'
19	*Viburnum tinus*
Shrub	
1	*Abelia × grandiflora*
2	*Buddleja alternifolia*
3	*Caryopteris × clandonensis*
4	*Caryopteris × clandonensis* 'Summer Sorbet'
5	*Ceanothus × delilianus*

6	*Choisya ternata*
7	*Elaeagnus* × *ebbingei*
8	*Laurus nobilis*
9	*Lonicera* × *purpusii*
10	*Lonicera japonica* 'Halliana'
11	*Lonicera korolkowii*
12	*Olea europaea*
13	*Osmanthus heterophyllus*
14	*Paeonia suffruticosa*
15	*Philadelphus coronarius*
16	*Sarcococca confusa*
17	*Staphylea colchica*
18	*Syringa patula* 'Miss Kim'
19	*Syringa vulgaris*
20	*Viburnum* × *pragense*
21	*Viburnum carlesii*
22	*Viburnum plicatum* 'Mariesii'
23	*Vitex agnus-castus*
24	*Vitex agnus-castus* 'Shoal Creek'
Herbaceous	
1	*Agastache*
2	*Agastache* 'Blue Fortune'
3	*Artemisia* 'Powis Castle'
4	*Clinopodium nepeta*
5	*Hyssopus officinalis*
6	*Lavandula angustifolia*
7	*Mentha spicata var. crispa*
8	*Nepeta* × *faassenii*
9	*Salvia microphylla*

10	*Salvia sclarea*
11	*Santolina chamaecyp*
12	*Stachys byzantina*
13	*Teucrium hircanicum*
14	*Thymus citriodorus*
15	*Thymus praecox*

Everygreen Plants	
Tree	
1	*Abies cephalonica*
2	*Abies pinsapo*
3	*Calocedrus decurrens*
4	*Cedrus deodara*
5	*Chamaecyparis lawsoniana*
6	*Chamaecyparis nootkatensis*
7	*Cupressus arizonica*
8	*Fatsia japonica*
9	*Juniperus chinensis*
10	*Juniperus scopulorum* 'Blue Heaven'
11	*Magnolia grandiflora*
12	*Olea europaea*
13	*Picea orientalis*
14	*Picea pungens* 'Koster'
15	*Pinus nigra*
16	*Pseudotsuga menziesii*
17	*Quercus* × *turneri* 'Pseudoturneri'
18	*Quercus ilex*
19	*Thuja orientalis*
20	*Thuja plicata* 'Zebrina'

21	*Viburnum rhytidophyllum*
Shrubs	
1	*Aucuba japonica* 'Variegata'
2	*Cotoneaster* × *suecicus* 'Skogholm'
3	*Cotoneaster salicifolius* 'Herbstfeuer'
4	*Elaeagnus* × *ebbingei*
5	*Hebe pinguifolia*
6	*Juniperus sabina* 'Aureovariegata'
7	*Juniperus virginiana* 'Grey Owl'
8	*Laurus nobilis*
9	*Lonicera nitida* 'Maigrün'
10	*Osmanthus heterophyllus*
11	*Phyllostachys viridiglaucescens*
12	*Pyracantha hybrids*
13	*Sarcococca confusa*
14	*Viburnum tinus*
Herbaceous	
1	*Asarum europaeum*
2	*Heuchera villosa*
3	*Phlomis russeliana*
4	*Sedum rupestre*
Ground Cover	
1	*Erica carnea*
2	*Hedera colchica* 'Sulphur Heart'
3	*Vinca major*
4	*Vinca minor*

Edible Plants	
Tree	
1	*Celtis occidentalis*
2	*Cercis siliquastrum*
3	*Corylus colurna*
4	*Crataegus pinnatifida*
5	*Diospyros kaki*
6	*Malus baccata* 'Street Parade'
7	*Malus* 'Evereste'
8	*Malus* 'Hopa'
9	*Malus* 'Red Obelisk'
10	*Malus trilobata* (*Eriolobus trilobatus*)
11	*Malus* 'Winter Gold'
12	*Pyrus communis*
13	*Sorbus aucuparia* 'Cardinal Royal'
14	*Sorbus domestica*
Shrub	
1	*Cornus mas*
2	*Crataegus intricata*
4	*Lycium barbarum*
5	*Ribes sanguineum*
Herbaceous	
1	*Agastache* 'Blue Fortune'
2	*Allium tuberosum*
3	*Mentha spicata var. crispa*
4	*Nepeta × faassenii*
5	*Salvia sclarea*
6	*Satureja montana*
7	*Thymus citriodorus*

Winter Flowering Plants	
Tree	
1	*Cedrus atlantica*
2	*Juniperus* × *media* 'Pfitzeriana Aurea'
3	*Juniperus chinensis* 'Keteleerii'
4	*Parrotia persica*
5	*Prunus* × *subhirtella* 'Autumnalis'
Shrub	
1	*Erica carnea*
2	*Forsythia ovata*
3	*Hamamelis* × *intermedia* 'Jelena'
4	*Jasminum nudiflorum*
5	*Lonicera* × *purpusii*
6	*Lonicera fragrantissima*
7	*Lonicera japonica* 'Halliana'
8	*Lonicera standishii*
9	*Sarcococca confusa*
10	*Sarcococca hookeriana*
11	*Viburnum* × *bodnantense*
12	*Viburnum farreri*
13	*Viburnum tinus*
Herbaceous	
1	*Brassica napus*
2	*Crocus tommasinianus*

Colored Leaf Plants - all vegetation periods	
Tree	
1	*Fagus sylvatica* 'Atropunicea'
2	*Prunus cerasifera* 'Nigra'
3	*Prunus cerasifera* 'Woodii'
4	*Prunus serrulata* 'Royal Burgundy'
5	*Prunus virginiana* 'Canada Red'
Shrub	
1	*Caryopteris* × *clandonensis* 'Summer Sorbet'
2	*Euonymus fortunei* 'Emerald' n 'Gold'
3	*Hypericum* × *moserianum* 'Tricolor'
4	*Physocarpus opulifolius* 'Diabolo'
5	*Weigela florida* 'Variegata'
Herbaceous	
1	*Capsicum annuum* 'Black Pearl'
Colored Leaf Plants - only autumn	
Tree	
1	*Acer griseum*
2	*Acer palmatum*
3	*Diospyros kaki*
4	*Ginkgo biloba*
5	*Ginkgo biloba* 'Globus'
6	*Liquidambar orientalis*
7	*Malus trilobata* (*Eriolobus trilobatus*)
8	*Malus tschonoskii*
9	*Metasequoia glyptostroboides*
10	*Parrotia persica* 'Firebird'
11	*Prunus* × *eminens* 'Umbraculifera' (*Prunus fruticosa* 'Globosa')
12	*Prunus* × *subhirtella* 'Plena'

13	*Prunus* 'Accolade'
14	*Prunus avium* 'Plena'
15	*Prunus campanulata*
16	*Prunus serrulata* 'Amanogawa'
17	*Prunus serrulata* 'Shogetsu'
18	*Prunus serrulata* 'Taihaku'
19	*Prunus* 'Spire' (*Prunus* × *hillieri* 'Spire')
20	*Pyrus calleryana* 'Capital'
21	*Pyrus calleryana* 'Chanticleer'
22	*Pyrus calleryana* 'Redspire'
23	*Rhus typhina*
24	*Sorbus* × *arnoldiana* 'Golden Wonder'
25	*Sorbus aucuparia* 'Balatoni Naplemente'
26	*Sorbus aucuparia* 'Cardinal Royal'
27	*Sorbus aucuparia var. edulis (Sorbus aucuparia subsp. moravica)*
28	*Sorbus* 'Dodong' *(Sorbus commixta* 'Ulung', 'Ullong'*)*
29	*Sorbus rotundifolia* 'Bükk Szépe'
Shrub	
1	*Cornus sanguinea* 'Ann's Winter Orange'
2	*Cornus sericea* 'Flaviramea'
3	*Euonymus alatus* 'Compactus'
4	*Syringa patula* 'Miss Kim'
5	*Viburnum carlesii*
6	*Viburnum opulus* 'Roseum'
7	*Viburnum plicatum* 'Mariesii'
Vine	
1	*Parthenocissus tricuspidata* 'Veitchii'

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DEPT. OF GARDEN AND OPEN SPACE DESIGN

HOSPITAL PLANT APPLICATION IN THE CONTEXT OF HORTICULTURAL THERAPY

students:

Qin Hongbei

supervisors:

Dr. Krisztina Szabó

M-01
Jahn Ferenc South -Pest Hospital Tree Survey Map

(Source: Pap, 2017)

North:

Scale:

0 100m

date:

2023.05.09

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students:

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Dr. Krisztina Szabó

M-02
Szent Imre Hospital Tree Survey Map

(Source: Wittmann, 2015)

North:

Scale:

0 20m

date:

2023.05.09

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students:

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M-03
Szent János Hospital Tree Survey Map

(Source: Németh, 2008)

North:

Scale:

0 50m

date:

2023.05.09

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HOSPITAL PLANT APPLICATION IN THE CONTEXT OF HORTICULTURAL THERAPY

students:
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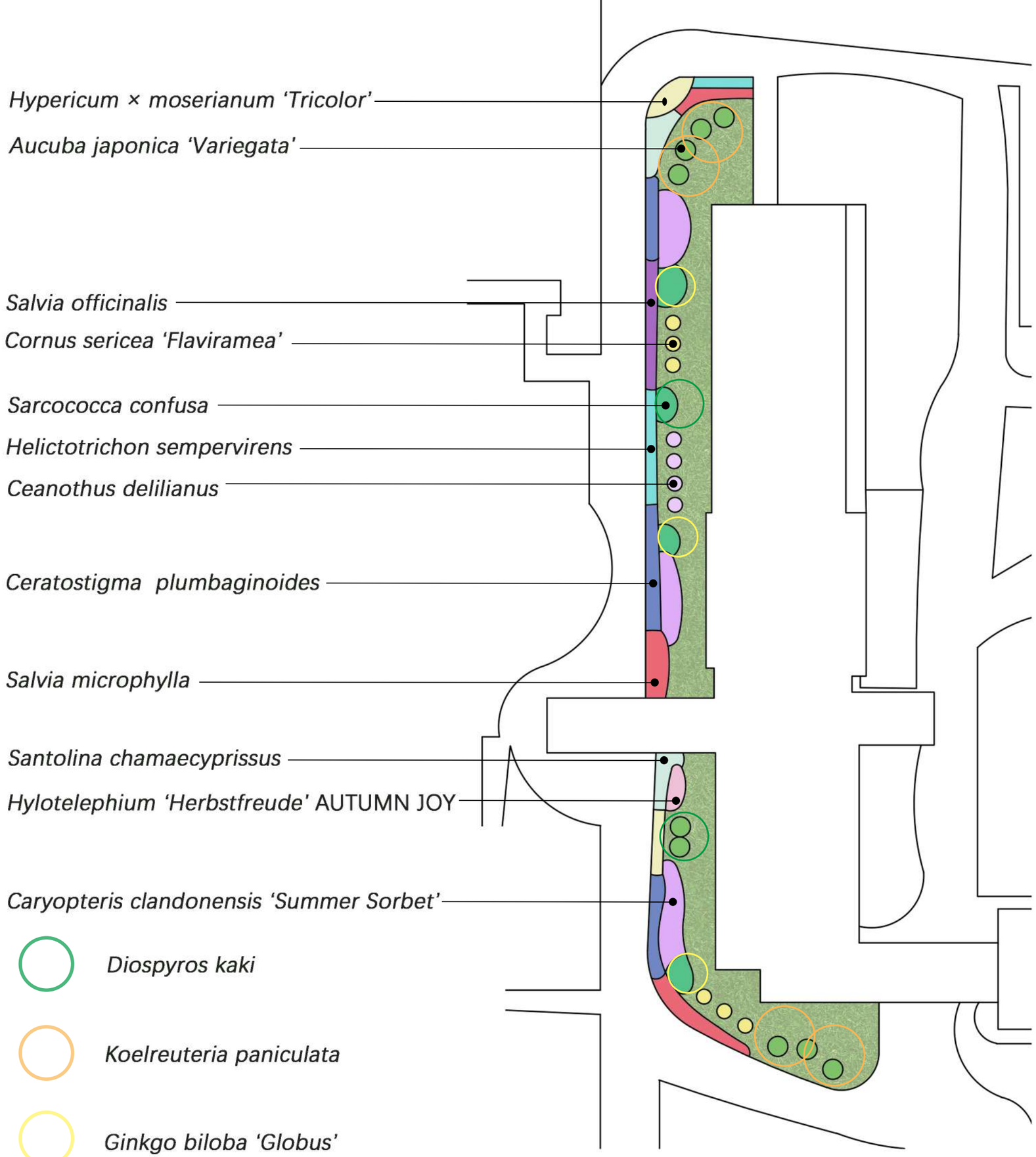
M-04
Site 1 Planting Design Plan

North:

Scale:
0 2 4m

date:
2023.05.09



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students:
Qin Hongbei

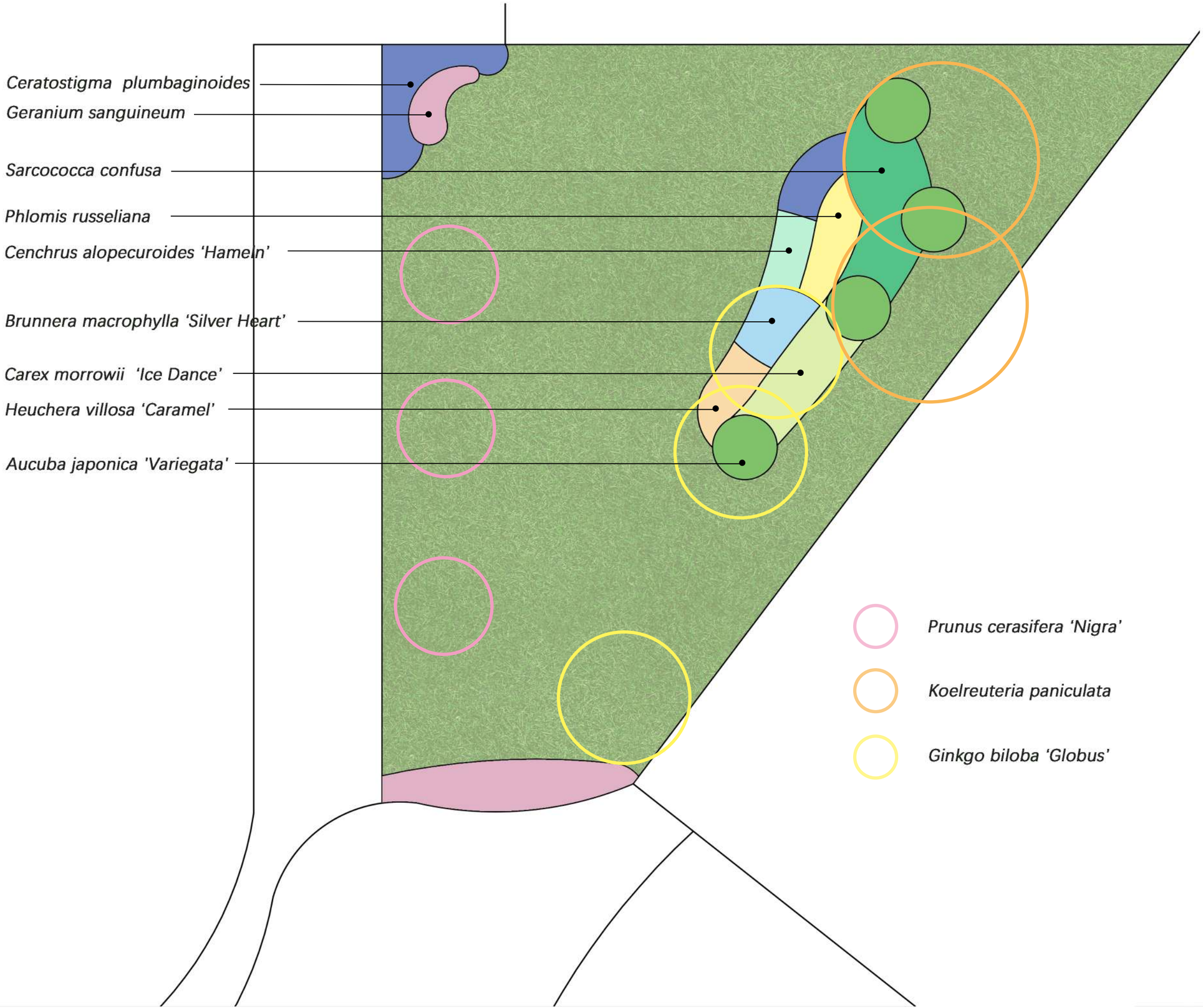
supervisors:
Dr. Krisztina Szabó

M-05
Site 2 Planting Design Plan

North:

Scale:
0 5 10m

date:
2023.05.09



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HOSPITAL PLANT APPLICATION IN THE CONTEXT OF HORTICULTURAL THERAPY

students:

Qin Hongbei

supervisors:

Dr. Krisztina Szabó

M-06
Site 3 Planting Design Plan

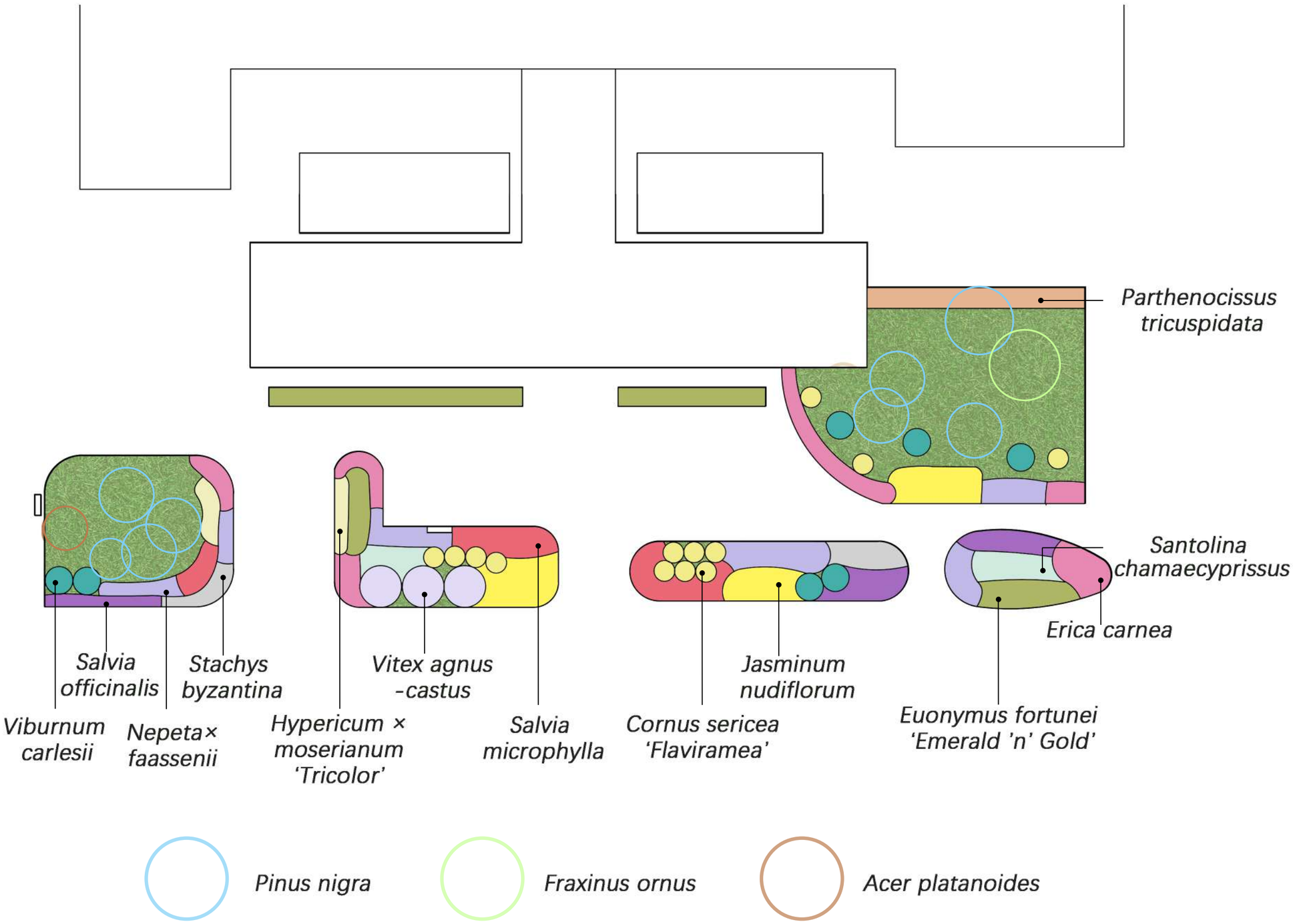
North:

Scale:

0 2 4m

date:

2023.05.09



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HOSPITAL PLANT APPLICATION IN THE CONTEXT OF HORTICULTURAL THERAPY

students:
Qin Hongbei

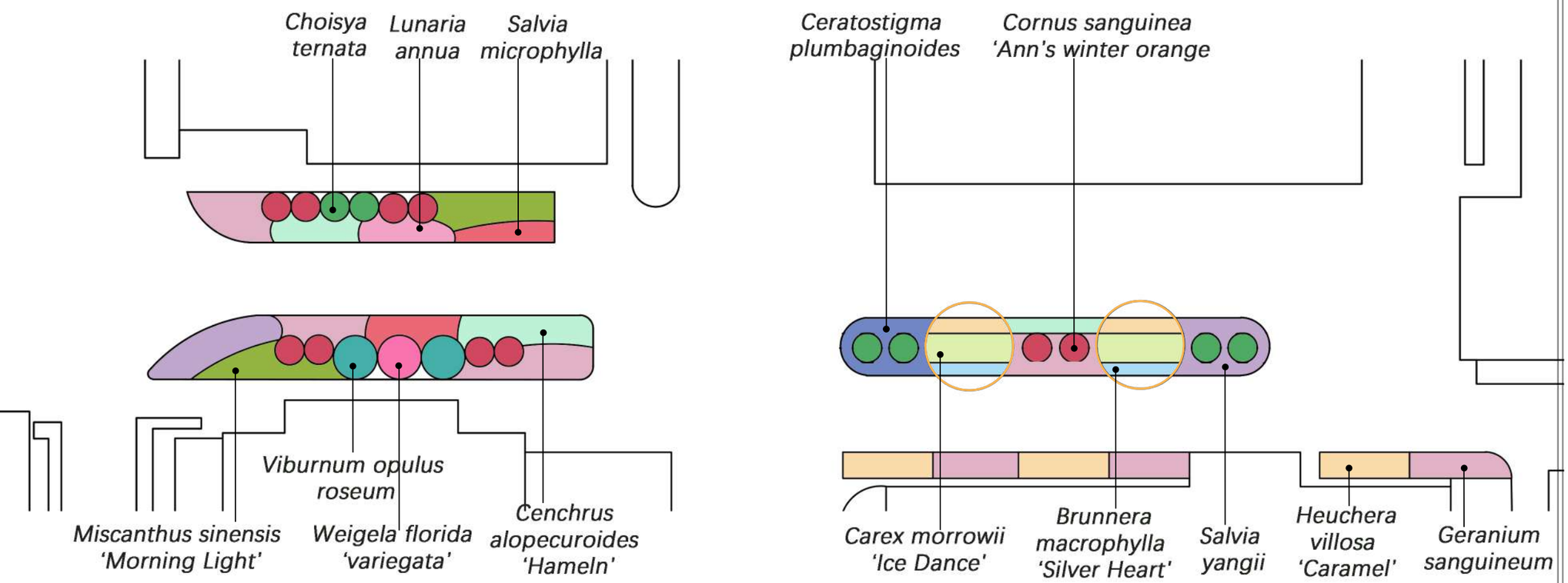
supervisors:
Dr. Krisztina Szabó

M-07
Site 4 Planting Design Plan

North:

Scale:
0 5 10m

date:
2023.05.09



Koelreuteria paniculata

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students:

Qin Hongbei

supervisors:

Dr. Krisztina Szabó

M-08
Site 5 Planting Design Plan

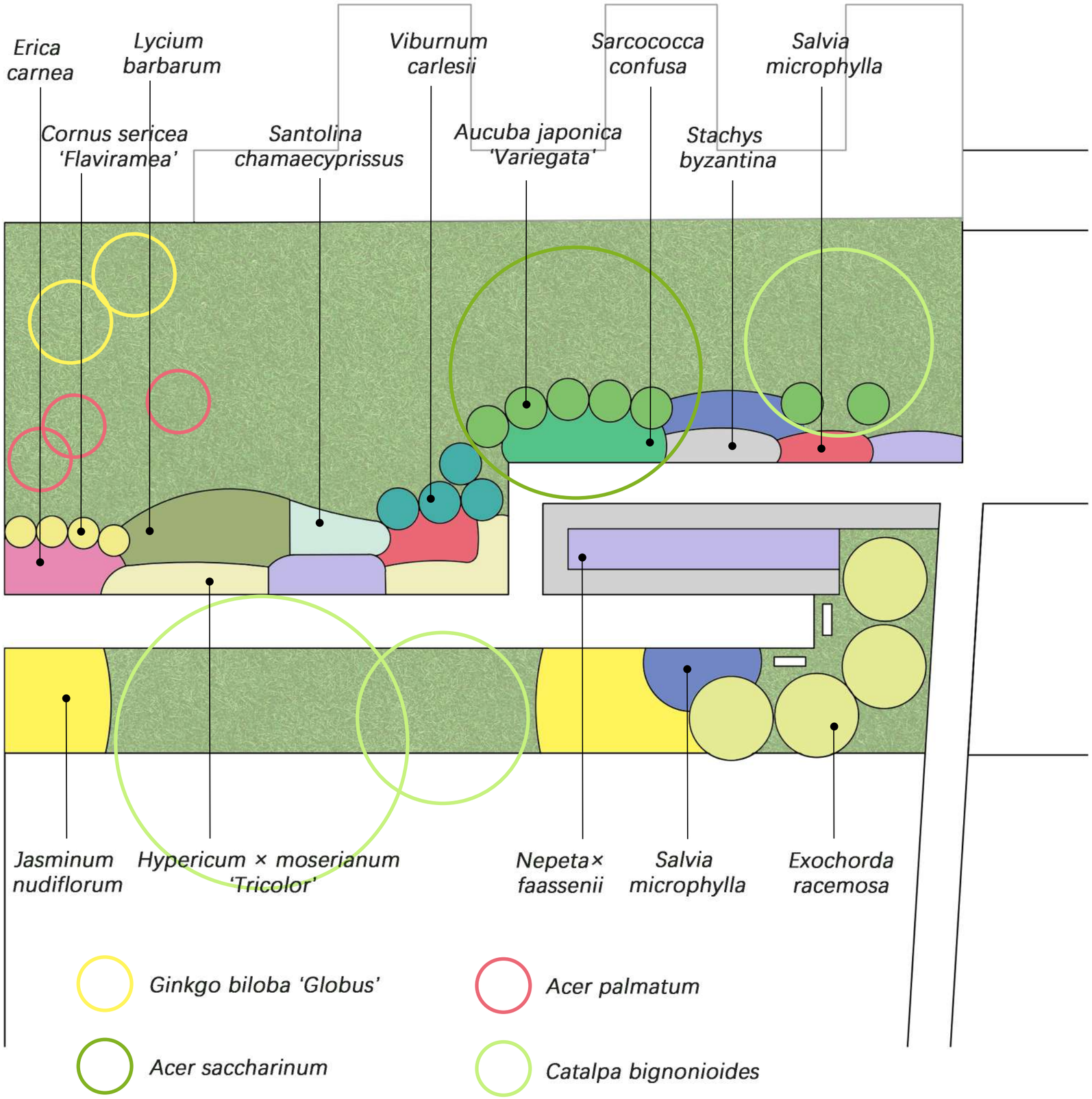
North:

Scale:

0 5 10m

date:

2023.05.09



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HOSPITAL PLANT APPLICATION IN THE CONTEXT OF HORTICULTURAL THERAPY

students:

Qin Hongbei

supervisors:

Dr. Krisztina Szabó

M-09
Site 6 Planting Design Plan

North:

Scale:

0 5 10m

date:

2023.05.09

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Place and date: 2023 year 05 month 06 day

Internal supervisor

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on authenticity and public assess of mater's thesis

Student's name: Qin Hongbei

Student's Neptun ID: Z750CS

Title of the document: Hospital Plant Application in the Context of Horticultural Therapy

Year of publication: 2023

Department: Department of Garden and Open Space Design

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