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EDIBLE LANDSCAPING: USE OF FRUIT TREES IN THE AESTHETIC AND FUNCTIONAL COMPOSITION OF ENVIRONMENTS

PAISAGISMO COMESTÍVEL: USO DE ÁRVORES FRUTÍFERAS NA COMPOSIÇÃO ESTÉTICA E FUNCIONAL DE AMBIENTES

PAISAJISMO COMESTIBLE: USO DE ÁRBOLES FRUTALES EN LA COMPOSICIÓN ESTÉTICA Y FUNCIONAL DE AMBIENTES

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ABSTRACT

This article presents a residential landscape design proposal that uses fruit trees as decorative and functional elements. The initiative aims to integrate aesthetic, ecological, and productive concepts, respecting the characteristics of the local biome and promoting practices focused on urban sustainability. The proposal is based on the edible landscaping approach, highlighting the multiple benefits of incorporating edible plants into residential spaces, such as food production, aesthetic enhancement, and contribution to the microclimate and biodiversity. The work combines theoretical and practical knowledge acquired in the technical course in landscaping, culminating in the development of an applied graphic design, developed on an A3 format using SketchUp software. The species selection took into account the climate of Palmas, Tocantins, Brazil, the size of the plants, their viability in pots, and their visual harmony with the proposed environment—a gourmet balcony. The result reinforces the potential of edible landscaping as a strategic tool for urban resilience, environmental engagement, and the redevelopment of residential areas.

Keywords: Edible Landscaping. Fruit Trees. Ornamental Plants. Sustainable Landscaping. Urban Greening.

RESUMO

Este artigo apresenta uma proposta de projeto paisagístico residencial que utiliza árvores frutíferas como elementos decorativos e funcionais. A iniciativa visa integrar conceitos estéticos, ecológicos e produtivos, respeitando as características do bioma local e promovendo práticas voltadas à sustentabilidade urbana. A proposta parte da abordagem do paisagismo comestível, evidenciando os múltiplos benefícios da inserção de plantas alimentícias em espaços residenciais, como a produção de alimentos, a valorização estética e a contribuição para o microclima e a biodiversidade. O trabalho articula conhecimentos teóricos e práticos adquiridos no curso técnico em paisagismo, culminando na elaboração de um projeto gráfico aplicado, desenvolvido em base A3 com uso do software SketchUp. A seleção das espécies levou em consideração o clima de Palmas (TO), o porte das plantas, a viabilidade em vasos e a harmonia visual com o ambiente proposto, uma varanda gourmet. O resultado reforça o potencial do paisagismo comestível como ferramenta estratégica para a resiliência urbana, o engajamento ambiental e a requalificação de áreas residenciais.

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Palavras-chave: Paisagismo Comestível. Árvores Frutíferas. Plantas Ornamentais. Paisagismo Sustentável. Esverdeamento Urbano.

RESUMEN

Este artículo presenta una propuesta de diseño de paisaje residencial que utiliza árboles frutales como elementos decorativos y funcionales. La iniciativa busca integrar conceptos estéticos, ecológicos y productivos, respetando las características del bioma local y promoviendo prácticas enfocadas en la sostenibilidad urbana. La propuesta se basa en el enfoque del paisajismo comestible, destacando los múltiples beneficios de incorporar plantas comestibles en espacios residenciales, como la producción de alimentos, la mejora estética y la contribución al microclima y la biodiversidad. El trabajo combina los conocimientos teóricos y prácticos adquiridos en el curso técnico de paisajismo, culminando con el desarrollo de un diseño gráfico aplicado, desarrollado en formato A3 con el software SketchUp. La selección de especies tuvo en cuenta el clima de Palmas, Tocantins, Brasil, el tamaño de las plantas, su viabilidad en macetas y su armonía visual con el entorno propuesto: un balcón gourmet. El resultado refuerza el potencial del paisajismo comestible como herramienta estratégica para la resiliencia urbana, la participación ambiental y la reurbanización de áreas residenciales.

Palabras clave: Paisajismo Comestible. Árboles Frutales. Plantas Ornamentales. Paisajismo Sostenible. Ecologización Urbana.

1 INTRODUCTION

Contemporary landscaping has been significantly transformed in the face of the growing demand for sustainable, multifunctional solutions that integrate aesthetics and utility. In this context, edible landscaping, especially with the use of fruit trees, has gained prominence by combining ornamental beauty, food production and respect for the natural environment. This approach not only values biodiversity, but also promotes food autonomy, environmental education, and reconnection with nature in urban and residential spaces (OLADELE, 2014)

The insertion of fruit species in landscaping contributes both to visual enrichment and to the functionality of the environment. Trees such as the jabuticaba tree, pitangueira, lemon and acerola tree, when well positioned, provide shade, attract pollinators and offer fresh fruits to the users of the space, transforming backyards, balconies, gardens and even indoor spaces into productive and harmonious areas. The appropriate selection of species, respecting the local biome, is essential to ensure the adaptation of the plants and the success of the project (BENÍTEZ-ESTRADA et al., 2022).

Authors such as Tesfay et al. (2018) highlight the importance of indigenous fruit trees as key elements in food resilience and sustainable management of natural resources in local communities. McIntyre et al. (2009) point out that the use of practices such as soil cover and intercropping with vegetables and fruit trees intensifies the ecological benefits, promoting moisture retention, pest control and increased productivity in integrated systems. Contreras (2022) reinforce the relevance of analyzing the potential distribution of wild fruit trees to identify species adapted to different environmental conditions, favoring their rational introduction into ecological landscaping.

In this scenario, this article aims to propose and apply a landscaping project focused on the use of fruit trees, seeking to combine aesthetic function and environmental functionality, respecting the characteristics of the local biome. The work is based on the premise that landscaping can go beyond visual contemplation, taking an active role in promoting urban sustainability, food security and human well-being.

2 JUSTIFICATION

The adoption of fruit trees in landscape composition is an innovative and multifunctional strategy to integrate aesthetics, functionality and sustainability in urban and residential environments. This approach values biodiversity and promotes food production in

urban space, meeting the growing demand for ecologically integrated and socially inclusive landscape solutions (TESFAY et al., 2024).

The concept of edible landscaping is linked to the use of food plants, such as native fruit trees, vegetables, and herbs, in ornamental projects, promoting simultaneous benefits in terms of beauty, public health, food safety, and environmental education (FETOUH, 2018; MCINTYRE et al., 2022). In addition, it contributes to reconnecting urban populations to local food systems, strengthening sustainable consumption practices and encouraging community engagement (XIAO et al., 2023).

The integration of fruit trees into urban landscapes must consider aspects such as available space, multifunctionality, ease of management, and social participation, which contributes to urban resilience and the sustainable use of natural resources (BENÍTEZ et al., 2024; MARTIN et al., 2024). Several studies have shown that the use of native fruit species can mitigate the effects of climate change and increase food security in tropical and subtropical regions (BRANDNER et al., 2024; LEE et al., 2017).

Sustainable landscaping, in turn, is based on practices that reconcile aesthetics with environmental conservation, such as the use of native species, water management, erosion control, shading, and valuing pollinating fauna (MCINTYRE et al., 2022; OLADELE, 2014). The convergence between edible and sustainable landscaping results in ecological and productive solutions, capable of transforming urban areas into spaces for production, leisure, and environmental education (BENÍTEZ et al., 2024).

Despite their potential, the widespread adoption of these practices still requires greater technical and scientific support, in addition to the formulation of specific public policies to encourage edible landscaping in urban contexts, especially in countries with rich biodiversity such as Brazil (TESFAY et al., 2024; MARTIN et al., 2024).

In this way, the proposal to incorporate fruit trees in landscape projects is consolidated as a strategic and innovative practice, promoting quality environmental, food safety, social inclusion and aesthetic appreciation. The following sections detail the main species indicated, selection criteria and practical examples of application in the Brazilian context.

3 DEVELOPMENT

3.1 KEY BENEFITS OF INTEGRATING EDIBLE LANDSCAPING INTO URBAN ENVIRONMENTS

The incorporation of edible landscaping in urban areas promotes a number of environmental, social, and aesthetic benefits. Among them, local food production, the reduction of the carbon footprint associated with food transport, the increase in food resilience and the improvement of the environmental quality of public and private spaces stand out (FETOUH, 2022). In addition, this type of landscaping values the multifunctionality of spaces by combining ornamental and utilitarian functions, strengthening urban sustainability and encouraging ecological cultivation practices.

Studies such as that of Oladele (2021) show that the diversity of fruit trees in peri-urban areas is associated with efficient land use, the stimulation of biodiversity, and the maintenance of traditional knowledge linked to the use of edible species. Thus, edible landscaping acts as a bridge between biodiversity conservation and sustainable food production.

3.2 CONTRIBUTIONS OF SUSTAINABLE LANDSCAPING TO BIODIVERSITY AND ECOLOGICAL HEALTH

Sustainable landscaping promotes ecological health through the conservation of natural resources, the mitigation of environmental impacts, and the creation of more balanced microclimates. Strategies such as the use of native plants, soil and water conservation, and the creation of ecological corridors are fundamental to increase biodiversity and restore natural habitats (BRANDNER; TACZANOWSKA, 2022).

In addition, planned green areas with an ecological focus contribute to urban resilience, helping to mitigate the effects of climate change, such as heat islands and water scarcity. These practices not only protect local fauna and flora, but also promote ecosystem services that are essential to human health and environmental balance.

3.3 IMPROVING WELL-BEING AND COMMUNITY ENGAGEMENT THROUGH EDIBLE LANDSCAPING

The presence of edible landscapes in urban environments has shown great potential to improve the physical and emotional well-being of populations. Contact with productive plants, in addition to reducing stress, strengthens the sense of belonging and the appreciation

of public space. As Xiao et al. (2022), there is a positive relationship between the presence of urban gardens and orchards and the willingness of residents to engage in community activities.

The promotion of urban agriculture through edible landscaping can also reduce social inequalities, provide educational experiences and strengthen the ties between citizens and the territory. The integration of these practices into urban planning expands opportunities for social participation and reconnects people to the food production process.

3.4 EFFECTIVE DESIGN STRATEGIES FOR IMPLEMENTATION IN URBAN AREAS

The successful implementation of edible landscape designs requires careful planning, which takes into account the spatial, climatic, social, and cultural conditions of each location. Effective strategies include the use of perennials, species diversification, the use of agroforestry systems, and participatory planning with the community (LEE; HSIEH, 2021).

According to Fetouh (2022), it is essential to consider simplified maintenance and universal access to spaces. Well-designed designs integrate functional elements such as pathways, rest areas, and efficient irrigation systems, ensuring accessibility and seamless usability. The design must also respect the principles of permaculture, with a focus on soil regeneration and making the most of available natural resources.

3.5 CHALLENGES TO THE ACCEPTANCE OF EDIBLE LANDSCAPES IN URBAN PLANNING

Despite its numerous benefits, edible landscaping still faces barriers to its effective insertion in public policies and formal urban planning structures. The lack of a clear definition of the concept, the scarcity of data and the limited perception of their functions restrict their implementation on a large scale (BRANDNER; TACZANOWSKA, 2022).

In addition, as Xiao et al. (2022), factors such as lack of institutional support, low community participation, and legal constraints can hinder the development and maintenance of these landscapes. Overcoming these challenges requires articulation between public authorities, urban planners, landscapers and civil society, as well as the recognition of edible landscapes as legitimate instruments for promoting sustainability and urban well-being.

Table 1

Fruit tree species recommended for edible landscaping in urban contexts

SPECIES	SCIENTIFIC NAME	POSTAGE	LANDSCAPE FUNCTION	BENEFITS ECOLOGICAL AND SOCIAL	REFERENCES
Guava	Psidium guajava	Small	Dense canopy, ornamental flowers	Feeding, pollinator attraction, easy adaptation	Martin *et al.* (2024); Fetouh (2018)
Surinam	Eugenia uniflora	Medium	Reddish color of the fruits	Abundant fruiting, attractive landscape and food	Mcintyre *et al*. (2022)
Cajazeira	Spondias mombin	Medium to large	Shading, rusticity	High water tolerance, fruits for human and animal consumption	Tesfay *et al.* (2024); Benítez *et Al.* (2024)
Jabuticaba tree	Plinia cauliflora	Medium	Fruits on the trunks, unique aesthetics	Educational and ornamental potential, cultural value	Oladele (2014)
Black mulberry	Morus nigra	Small	Dense foliage, contrasting fruits	Fast growing, food source and Natural Pigment	Brandner *et al.* (2024)
Acerola	Malpighia emarginata	Small	Showy and nutritious fruits	High concentration of vitamin C, ideal for Small spaces	Mcintyre *et al.* (2022)
Dwarf mango tree	Mangifera indica (dwarf cultivars)	Medium	Shade, flowery scent	Fruit production in restricted spaces, adaptation to pots	Lee *et al*. (2017); Xiao *et al*. (2023)

Source: Prepared by the authors, adapted from referenced authors (2025). Species recommended for the urban environment.

Table 1 presents a selection of fruit tree species recommended for use in edible landscaping projects, considering their aesthetic, functional and ecological attributes. The listed species, such as guava, pitangueira, jabuticabeira, cajazeira, among others, were chosen based on their adaptability to urban environments, potential for food production and contribution to environmental comfort.

The information includes the scientific name, size of the plant, landscape function (such as shading, ornamental fruiting or visual attractiveness), in addition to the associated ecological and social benefits, such as encouraging biodiversity, strengthening food security, and stimulating community involvement.

The inclusion of these species favors the multifunctionality of green spaces, while promoting aesthetic quality, food utility and urban sustainability. The board also serves as a practical tool for landscape planners and environmental managers, assisting in the choice of

suitable species for different contexts and purposes (MCINTYRE et al., 2022; TESFAY et al., 2024; BENÍTEZ et al., 2024).

4 THEORETICAL FRAMEWORK

The construction of this theoretical framework is based on an integrative literature review with a time frame of the last five years (2020–2025), using the SciSpace database. Boolean operators were used to refine the search for scientific articles, considering the following combined descriptors: "Edible landscaping AND Fruit trees", "Edible landscaping AND Urban greening", and "Edible landscaping AND Sustainable landscaping". No restrictions were applied regarding the language or type of publication, ensuring a wide thematic coverage.

The relationship between edible landscaping and the use of fruit trees has been widely discussed in the recent scientific literature, highlighting its ecological, food and landscape relevance. Tesfay et al. (2024) analyzed the diversity and ecosystem services provided by indigenous fruit trees in the Tigray region of Ethiopia, highlighting their key role in local food security, the regeneration of degraded landscapes, and the enhancement of native flora. These elements are particularly relevant for building resilient urban landscapes.

In addition, McIntyre et al. (2022) discuss management practices aimed at maintaining sustainable edible landscapes in Florida, emphasizing the use of techniques such as mulching for fruit species, which favors moisture retention, control of invasive plants, and soil health. Benítez et al. (2024) investigate the potential distribution of wild fruit species in the face of different climate change scenarios, proposing their strategic use in the composition of urban green areas as a measure of ecological adaptation and food security.

The interface between edible landscaping and green urban planning has also been the focus of studies exploring the integration between ecological, social, and aesthetic dimensions. Lee et al. (2017) analyzed spatial factors that influence the patterns of implantation of edible landscapes in urban villages and alleys, highlighting the role of urban configuration in the feasibility and use of these spaces. In China, Xiao et al. (2023) identified a high degree of willingness of residents to participate in edible gardens and urban fruit tree planting projects, reinforcing the importance of community participation for the success of these initiatives.

However, Fetouh (2018), in turn, proposed guidelines for urban horticulture based on edible landscaping, prioritizing the multifunctionality of public spaces, such as leisure, food

production, and environmental education. Brandner et al. (2024) mapped wild food collection areas in urban green spaces, revealing patterns of use and social preferences that can guide the planning of more nutritious and sustainable cities. Also in this scope, Oladele (2014) highlights the diversity of fruit trees in peri-urban centers and their direct implications for food security and ecological afforestation.

The convergence between edible landscaping and urban sustainability has gained prominence as a systemic response to the environmental, food, and climate crises. Khotimah et al. (2024) proposed the implementation of edible landscaping as a strategy to mitigate urban heat islands, highlighting their potential for natural cooling and increased green cover. Robinson et al. (2017) examined sustainable business models related to the implementation of vegetable gardens and fruit trees in metropolitan landscapes, indicating economic viability and generation of green jobs.

During the COVID-19 pandemic, Sanchez et al. (2021) highlighted how technologies and practices associated with edible landscaping have contributed to promoting food self-sufficiency, especially in vulnerable urban communities. Other studies, such as those by Narandžić et al. (2023) and Strugova et al. (2022), broadened the debate by addressing social and educational perceptions related to the presence of food plants in public spaces, pointing to gains in environmental awareness, local identity, and appreciation of urban space.

This selection of authors and approaches strengthens the understanding that edible landscaping is not just an ornamental practice, but a strategic tool for urban sustainability, food security, community engagement and environmental education. The theoretical foundation supports the methodological proposal of this study and guides the practical application of edible landscaping with a focus on the reality of Palmas in the State of Tocantins.

5 CASE STUDY

5.1 INSERTION OF NATIVE FRUIT SPECIES IN THE URBAN LANDSCAPING OF PALMAS (TO)

Considering the climatic and edaphological context of the city of Palmas, capital of the state of Tocantins, the choice of fruit species must respect the conditions of the Cerrado biome, characterized by high temperatures, well-defined dry season and acidic soils with low fertility. In this sense, the use of native species or species adapted to the local biome is

essential to ensure the ecological resilience, functionality, and low maintenance of edible landscaping projects (OLADELE, 2021; LEE; HSIEH, 2021).

The species cashew (Anacardium occidentale), papaya (Carica papaya), acerola (Malpighia emarginata), star fruit (Averrhoa carambola), geiroba (Syagrus oleracea) and jabuticaba (Plinia cauliflora) stand out for their adaptation to the tropical climate, ornamental value and significant food production, being frequently mentioned in studies on urban gardens, agroforestry systems and peri-urban fruit diversity (FETOUH, 2022; OLADELE, 2021).

Each of these species can be strategically inserted indoors or outdoors, according to their characteristics:

- Cashew tree (Anacardium occidentale): medium-sized and wide canopy, ideal for outdoor and shaded areas. Its fruits are rich in vitamin C and antioxidants, and its nuts have high nutritional value. Recommended for large gardens and productive backyards (FETOUH, 2022).
- Papaya (Carica papaya): fast-growing and early fruiting, it adapts well to backyards and small outdoor spaces. It requires full sun and well-drained soil (OLADELE, 2021).
- Acerola (Malpighia emarginata): indicated for large beds or pots, in transition areas between the interior and exterior, with high production of fruits rich in vitamin C (LEE; HSIEH, 2021).
- Star fruit (Averrhoa carambola): medium-sized and high-yielding, it can be used on wide sidewalks or residential gardens, presenting fruits with a strong visual appeal (FETOUH, 2022).
- Gueiroba (Syagrus oleracea - Cerrado palm): adapted to poor and well-drained soils, it can compose large outdoor spaces, being used both for its ornamental function and for its edible heart of palm (BRANDNER; TACZANOWSKA, 2022).
- Jabuticaba tree (Plinia cauliflora): with a versatile size, it can be grown in pots or beds. Its abundant fruiting and the affective value associated with the plant make it ideal for sensory gardens and living areas (XIAO; CHOU, 2022).

In this topic, the technical criteria for choosing the species are presented, considering climate, soil type, plant size, flowering/fruiting cycle, and pest resistance, as pointed out by Fetouh (2022) and Xiao et al. (2022). The aesthetic composition of the project is based on

the harmony of shapes, colors, and textures, seeking a balance between the productive function and the visual and ecological value of the environment (LEE; HSIEH, 2021).

The use of native edible plants in Palmas (TO) strengthens the proposal for sustainable landscaping, promoting environmental education, food security and the rescue of traditional cultivation practices, while favoring the creation of greener, healthier and multifunctional urban spaces (BRANDNER; TACZANOWSKA, 2022).

Table 2

Comparative table of native fruit species adapted for edible landscaping in Palmas (TO)

SPECIES	POSTAGE OF PLANT	OPTIMAL USE	FRUITING SEASON	LANDSCAPE BENEFITS
Cashew tree (*Anacardium occidentale*)	Medium to large	Outdoor (large gardens, backyards)	October to January	Shading, visual attraction, fruit and nut production
Papaya (*Carica papaya*)	Medium	Outdoor (backyards, small orchards)	Year-round (in warm weather)	Early fruiting, tropical look, easy cultivation
Acerola (*Malpighia emarginata*)	Small to medium	Indoor/outdoor (large pots, beds)	September to January	High productivity, decorative fruits, Ideal for small spaces
Star Fruit (*Averrhoa carambola*)	Medium	Outdoor (wide sidewalks, residential gardens)	February to May	Fruits with exotic shape (star), Coverage and ornamental value
Yellow-throated Flycatcher (*Syagrus oleracea*)	Medium to large	External (squares, open areas, drained soils)	November to March	Rustic palm tree, value Ornamental and edible heart of palm production
Jabuticaba tree (*Plinia cauliflora*)	Small to medium	Indoor/outdoor (pots, gardens sensory and backyards)	September to December	Fruits directly on the stem, high visual appeal and cultural

Source: Prepared by the authors, adapted from the authors Fetouh (2022); Oladele (2021); Lee et al (2021); Brandner et al. (2022); Xiao et al. (2022).

Table 2 presents a comparison between native fruit species and those adapted to the tropical climate of Palmas (TO), considering criteria such as plant size, ideal use, fruiting time and landscape benefits. It is observed that the cashew tree, the jabuticaba tree, the papaya tree, the acerola tree, the star fruit tree and the geiroba are species that combine ornamental and utilitarian value, being recommended for different types of urban environments. The medium to large cashew and gueiroba are more suitable for outdoor and open areas, such as backyards and squares, offering shade and significant fruit production. Species such as

acerola and jabuticaba can also be grown in pots or beds, favoring their insertion in indoor or transitional environments. The star fruit, in turn, stands out for the visual appeal of its star-shaped fruits, being suitable for sidewalks and residential gardens. The appropriate choice of these species allows for multifunctional landscapes, which promote urban sustainability, the beautification of spaces and the strengthening of local food systems

6 PRACTICAL APPLICATION

The project was structured on a conceptual basis focused on edible landscaping, prioritizing solutions adapted to the residential space and the integration of fruit species with ornamental, nutritional and ecological value. This approach seeks not only the aesthetic function, but also the promotion of food security, urban sustainability, and the mitigation of climate effects, through the selection of species that reconcile functionality, resilience, and well-being for the residents (FETOUH, 2018; WORDEN; BROWN, 2008; ROBINSON; CLOUTIER; EAKIN, 2017).

Recent research shows that the use of fruit trees in urban areas is an effective strategy to face the challenges of climate change and expand food availability, especially in tropical regions (BENÍTEZ et al., 2024; TESFAY et al., 2024; MARTIN et al., 2024). In addition, edible landscaping has been consolidating itself as a sustainable urban planning tool, favoring the adaptation of public and private spaces to more ecological and inclusive practices (NARANDŽIĆ et al., 2023; KHOTIMAH et al., 2024; STRUGOVA; SUNGUROVA, 2022).

The literature also points out that the incorporation of edible species in residential and community gardens can stimulate social participation, strengthen community bonds, and promote new patterns of use of urban spaces, while contributing to biodiversity and the reduction of the "urban heat island" (BRANDNER et al., 2024; LEE et al., 2017; XIAO et al., 2023). Complementary practices, such as the use of mulching and integration with vegetables and herbs, reinforce the multifunctional character of these spaces (MCINTYRE et al., 2022; OLADELE, 2014).

Based on these references, the selection of the project's species sought to align with the recommendations of the scientific literature and local conditions, including fruit trees, shrubs and multiple-use plants, adapted to the tropical climate of Palmas (TO) and the Cerrado biome. The objective was to favor plants with vigorous growth, rusticity and good adaptation to cultivation in pots, ensuring ease of management in compact environments such as residential balconies.

Table 3

Fruit species used in the edible landscape design for gourmet balcony

SPECIES	SCIENTIFIC NAME	CULTIVATION METHOD	JUSTIFICATION FOR USE
Jabuticaba tree	*Plinia cauliflora*	Large pot / planter	Compact size, decorative fruiting on the trunk, affective value and pleasant aroma.
Acerola	*Malpighia emarginata*	Large vase	High production of fruits rich in vitamin C; ornamental shrub with attractive flowers.
Star Fruit	*Averrhoa star fruit*	Medium pot	Star-shaped fruits with visual appeal; Good adaptation and easy maintenance.
Papaya	*Carica papaya*	Large vase / sun corner	Fast growing, year-round fruits and a tropical look that enhances the balcony.
Gueiroba (Cerrado palm tree)	*Syagrus oleracea*	Pot or outdoor bed	Ornamental value and rusticity; Elegant leaves that contribute shade and freshness.

Source: Adapted Biomes. Prepared by the authors (2025).

The selection of fruit species to compose the gourmet balcony project was carried out based on criteria of functionality, aesthetics, climatic adaptability, ease of management and compatibility with compact environments, such as residential balconies. The city of Palmas (TO), located in a tropical climate and belonging to the Cerrado biome, requires heat-resistant plants, with the ability to develop in pots and that do not require intensive maintenance.

The jabuticaba tree (Plinia cauliflora) was chosen for its compact size and high ornamental value, especially for its fruiting directly on the trunk, which gives it a unique aesthetic. In addition, it is a plant with affective and cultural appeal, often associated with family food memory.

The acerola tree (Malpighia emarginata), in turn, is an abundant fruiting shrub, with fruits rich in vitamin C. Its well-formed crown, its small and colorful flowers and its good adaptation to large pots make it ideal for balconies that receive good natural light.

The star fruit tree (Averrhoa carambola) was selected for the exotic shape of its star-shaped fruits, which adds decorative value to the composition. It is an intermediate-sized plant, which can be conducted in pots and requires simple maintenance care.

The papaya tree (Carica papaya), known for its early fruiting and quick adaptation to heat, is suitable for sunny corners from the balcony. Its tropical look enhances the gourmet space, in addition to offering fruits practically all year round.

Finally, the gueiroba (Syagrus oleracea), a palm tree native to the Cerrado, was included for its rusticity, elegance of the leaves and ornamental value. Even in large pots or

outdoor beds, it contributes shade, freshness and movement to the environment, in addition to its heart of palm being edible.

The combination of these species results in a multifunctional composition, which combines beauty, sustainability and food production, integrating perfectly with the proposal of an edible landscaping applied to compact residential spaces, such as gourmet balconies.

7 FUTURE PERSPECTIVES

The growth of edible landscaping in urban contexts represents a consolidated trend that responds to contemporary environmental, social and food challenges. Recent studies show that the application of fruit and edible species in landscape planning tends to expand in school, institutional, community, and residential environments, stimulating food self-sufficiency, environmental education, improved public health, and urban resilience (FETOUH, 2018; SANCHEZ et al., 2021; STRUGOVA & SUNGUROVA, 2022).

Authors such as Benítez et al. (2024) and Martin et al. (2024) highlight the strategic importance of the use of wild and ethnomedicinal fruit trees, especially in climate change scenarios, contributing not only to food security, but also to the conservation of traditional knowledge and local biodiversity. This approach is corroborated by Tesfay et al. (2024), by showing that indigenous fruit trees in African regions play a crucial role in ecological restoration and support for rural and urban communities.

From a social point of view, investigations such as those by Xiao et al. (2023) and Narandžić et al. (2023) point to the increased willingness of residents to participate in edible landscaping projects, especially when these connect to community initiatives and offer multifunctional spaces. This perception is reinforced by Brandner et al. (2024), which map preferences for green spaces aimed at food collection, evidencing the potential of cities to integrate ecological and food functions.

In addition to social and ecological aspects, the strategic use of sustainable technologies, such as mulching applied to fruit trees in tropical and subtropical climates (MCINTYRE et al., 2022), and practices such as adaptive planting in heat islands (KHOTIMAH et al., 2024), pave the way for nature-based solutions in dense urban areas. The sustainable business model advocated by Robinson et al. (2017) also suggests that edible landscaping projects can be financially viable and integrated into the green economy.

Finally, authors such as Worden et al. (2008) and Lee et al. (2017) project that the consolidation of edible landscaping will depend on integrated actions between urban

planning, public policies, environmental education and popular engagement. The role of the landscaper, therefore, gains prominence not only as a designer of spaces, but as a technical and sociocultural mediator in the construction of more resilient and sustainably fed cities.

8 CONCLUSION

This proposal reinforces the relevance of integrating fruit trees in urban landscaping, promoting a balance between aesthetics, functionality and environmental responsibility. By combining visual beauty with food production, this approach expands the decorative potential of spaces while contributing to food security, public health, biodiversity conservation, and urban sustainability.

The adoption of edible landscaping in environments such as balconies, backyards, and common areas shows a paradigm shift in the way urban spaces are planned and experienced. More than an aesthetic resource, the use of fruit trees proves to be a multifunctional and educational strategy, capable of stimulating sustainable practices and bringing people closer to natural and food cycles.

In this context, the work of the technical landscaper is fundamental. Its performance as a transforming agent allows for the resignification of urban and peri-urban spaces, converting them into productive, regenerative and healthy environments. By integrating knowledge of botany, ecology, design, and technology, edible landscaping is an innovative and strategic practice for building more resilient, inclusive, and nature-connected cities.

In this way, this work not only proposes a functional landscape solution for the reality of Palmas (TO), but also contributes to the critical reflection on the directions of contemporary landscaping in the face of the socio-environmental challenges of the twenty-first century.

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