MULTIPLE USES OF EDIBLE PARTS IN ORNAMENTALS AND OTHER UNDERUSED TREE SPECIES

UTILIZĂRI MULTIPLE A PĂRȚILOR COMESTIBILE A UNOR SPECII ORNAMENTALE ȘI POMICOLE MAI PUȚIN UTILIZATE

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Abstract.
This paper explores the culinary potential of plants traditionally considered ornamental, highlighting the diversity of edible parts they can offer. We have considered several less used ornamental or fruit species with high ornamental value and their usable components, such as young leaves, flowers and fruits, discussing their nutritional profile and safety of consumption. In addition to the botanical aspects, the paper presents practical preparation methods, from salads and infusions to sweets and side dishes, offering innovative ideas for integrating them into everyday nutrition. Special emphasis is placed on the precautions necessary for the correct identification and avoidance of toxic species or those treated with chemicals. Finally, the study highlights the ecological and economic benefits of valorising these resources, promoting a more sustainable approach to our relationship with the plant world.
Key words: ornamentals, edible parts, valorisation, sustainability, fruits

Rezumat.
Această lucrare explorează potențialul culinar al plantelor considerate în mod tradițional ornamentale, evidențiind diversitatea părților comestibile pe care acestea le pot oferi. Am luat în considerare mai multe specii ornamentale sau pomicole mai puțin utilizate dar cu ridicată valoare ornamentala și componentele lor utilizabile, cum ar fi frunzele tinere, florile și fructele, aducând în discuție profilul lor nutrițional și siguranța consumului. Pe lângă aspectele botanice, lucrarea prezintă metode practice de preparare, de la salate și infuzii până la dulciuri și garnituri, oferind idei inovatoare pentru integrarea acestora în alimentația cotidiană. Un accent deosebit este pus pe precauțiile necesare pentru identificarea corectă și evitarea speciilor toxice sau a celor tratate cu substanțe chimice. În cele din urmă, studiul subliniază beneficiile ecologice și economice ale valorificării acestor

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resurse, promovând o abordare mai sustenabilă a relației noastre domeniul vegetal.

Cuvinte cheie: specii ornamentale, părți comestibile, valorificare, sustenabilitate, fructe

INTRODUCTION

Throughout history, the relationship between humans and plants has been fundamental, centred primarily on meeting the primary needs of food, shelter, and medicine. However, modern societies, especially those in urban areas, have begun to place increasing emphasis on the aesthetic and environmental role of plants, transforming public and private spaces into veritable green oases [Jahanshiri e*t al.,* 2020; Smyth, 2023]. This trend has led to a proliferation of ornamental species, chosen for the beauty of their flowers, foliage, or general shape [Negrea and Zlati*,* 2011]. Despite their undeniable landscape value, a significant number of these plants, along with other underutilized fruit species [Istrate *et al*., 2025], possess an often over looked potential: that of providing valuable food resources, exploitable through their various edible parts [Fernandes e*t al.,* 2017; Kalemba-Drożdż, 2016; Jakubczyk e*t al.,* 2022; Gupta e*t al.,* 2018; Martins-Loução *et al*., 2024].

Paradoxically, in the context of global concerns regarding food security, dietary diversification, and the promotion of sustainability, a large part of the plant biodiversity with sweetener potential remains unexplored or insufficiently exploited. Many of the species considered exclusively ornamental or those that grow spontaneously in diverse ecosystems have fruits, leaves, flowers, seeds or roots with remarkable nutritional and organoleptic properties, often superior to or complementary to those of traditional crops [Antić e*t al.,* 2021]. Moreover, these species can often be more resistant to adverse climatic conditions, less demanding on soil and less susceptible to diseases and pests, thus offering viable and sustainable alternatives to current agricultural systems [Thierry *et al*., 2023; Amăriuței *et al*., 2023; Bernardis *et al*., 2022 and 2023; Pașcu *et al*., 2021].

This research paper aims to explore and synthesize existing knowledge on the "multiple uses of edible parts of ornamental plants and other underutilized fruit species". By identifying and characterizing these plant resources, the paper aims not only to shed light on their gastronomic and nutritional potential, but also to promote a more integrated and sustainable approach to landscape design and natural resource management. Particular attention will be paid to species with demonstrated potential, analysing aspects related to their nutritional composition, consumption safety, preparation methods and potential applications in human nutrition and, implicitly, in the diversification of small-scale and large-scale agricultural production.

Ultimately, this research aspires to contribute to a better understanding and a broader valorisation of plant biodiversity, opening new perspectives for food security and human well-being.

MATERIALS AND METHODS

Samples

There was analysed three types of jams purchased from a local producer in Iași, *Conacul Goruni* (Figure 1).

This unit processes various horticultural products and manufactures jams, marmalades, juices and sauces.

Fig. 1. Analysed jams samples https://conaculgoruni.ro

Chemical parameters

The soluble solid content was assessed by the refractometric method, using a Refractometer (Optika HR-150N), and the results were expressed in ^{o}Brix. Titratable acidity (also called total acidity) was determined by the titrimetric method [Beceanu, 2010; Murariu *et al*., 2017].

Samples were homogenized with distilled water and titrated with 0.1 N NaOH solution [Bușterchi *et al*., 2025; Ciurlă *et al*., 2025].

The results were expressed in the prevailing acid, namely, % malic acid.

The pH of the sample was determined using a pH-meter from Hanna Instruments. The analyses were realised in triplicate according to Irimia [2021] and the means were represented in Table 1.

Sensory analyses

Sensory evaluation was performed by a panel of 40 untrained consumers (20 men and 20 women of 20 to 60 years old).

Members were chosen to identify the level of acceptance of jams. Using a 0–10 point hedonic scale, panel members rated the product's appearance, colour, smell, sweetens, bitterness, acceptability (1 - strongly dislike; 10 - strongly like).

The results were represented by means value in chart (Figure 2).

RESULTS AND DISCUSSION

The jam samples have been analysed in terms of chemical parameters according to the standards applied in food industry.

In terms of total soluble solids content, the highest value was obtained by the lilac flower jams sample (58^{o}Brix**)**, followed by elderflower jams 56^{o}Brix, and the

lowest value in mint jams 51°Brix. According to jam standards confirmed also by Irimia [2013], the final concentration must reach 70-75 refractometric degrees to ensure proper preservation of the product. All three samples are below the mentioned limit. This result can be attributed to the adaptation of the manufacturing technology, using a recipe with lower sugar content.

Table 1

Chemical parameters of jam samples

Samples	Total soluble solids content (TSS, °Brix)	pH	Total acidity (g acid malic/100 g product)
Liliac flower jam	58	4.1	0.31
Elderflower jam	56	3.7	0.44
Mint jam	51	3.9	0.36

Elderflower jam has the lowest acidity (lower pH), 3.7, in accordance with the requirements for gelling, which requires a favourable pH of 3.0-3.4. The other two samples have a slightly higher pH, 3.9 (mint jam) and 4.1 (liliac flower jam) which can affect gelling and preservation properties [Hosseini Bai *et al*., 2025; Gąsecka *et al*., 2023; Tóth *et al*, 2016].

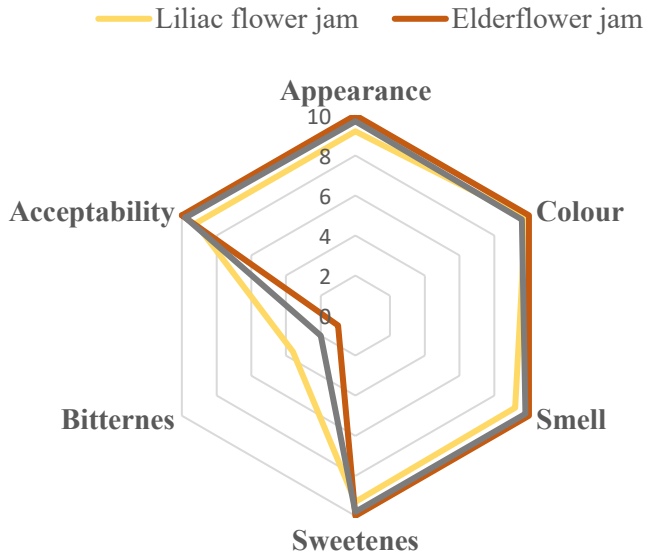

Fig. 2. Sensory characteristics of jams

The sensory analysis (Figure 2) shows that elderflower jam achieved the highest scores for all evaluated parameters, with perfect ratings and minimal bitterness, indicating superior consumer preference. Mint jam also scored highly, though a slightly

higher bitterness (2.0) may have slightly reduced its acceptability compared to elderflower. Lilac flower jam received good ratings for appearance and aroma but showed the highest bitterness (3.6), which affected its overall acceptability. These results suggest that bitterness has a strong influence on consumer's preferences.

The sensory evaluation of the unique aromatic trio contrasted the vibrant and mentholated freshness of the mint assortment with the subtly floral and effervescent sweetness of the elderberry one, in addition to the fine, enigmatic and spring-like note specific to the lilac flower jam.

When it comes to flowers, it is clear that the list could extend in terms of preferences but it's essential to only use edible flowers and make sure they haven't been treated with pesticides. If you want to try recipes with unusual flowers, it's always safest to buy them from growers who specialize in edible plants (Table 2).

Table 2

List of ornamentals and underutilized trees jams available on market

Nr. crt.	Specie name	Part of the plant	Common name	Source
1	*Viola odorata*	Flowers	Spanish violet	https://delicatessen.ro https://www.souschef.co.uk
2	*Syringa vulgaris*	Flowers	Lilac	https://conaculgoruni.ro
3	*Jasminum officinale*	Flowers	Jasmine	https://delicatessen.ro
4	*Citrus × sinensis*	Flowers	Orange	https://delicatessen.ro
5	*Paeonia officinalis*	Flowers	Peony	https://quartzboutique.fr
6	*Robinia pseudoacacia*	Flowers	Acacia	https://pink-skink.com
7	*Papaver somniferum*	Flowers	Poppy	https://www.foodturkiye.com
8	*Ziziphus jujuba*	Fruits	Jujube	https://www.casoinonline.it https://www.iltomolo.it
9	*Mespilus germanica*	Fruits	Medlar	https://www.casoinonline.it
10	*Arbutus unedo*	Fruits	Strawberry tree	https://www.casoinonline.it
11	*Cornus mas*	Fruits	Cornelian cherry	https://www.fromaustria.com
12	*Rosa canina*	Fruits	Rosehip	https://www.fromaustria.com
13	*Sambucus nigra*	Fruits Flowers	Elderberry	https://www.fromaustria.com https://conaculgoruni.ro

Elderflower jam delights the senses with an unmistakable, intensely floral and fresh aroma, complemented by a sweet-fragrant taste, often with a subtle sour note given by lemon, and a delicate texture of the flowers infused in syrup.

Lilac flower jam stands out for its intense, floral and eccentric aroma, a refined taste that combines the sweetness of the syrup with a distinctive, slightly bitter note (similar to that of bitter cherries), and the fine petals add a precious and delicate texture.

Mint jam offers a unique balance, combining the sweetness of the well-bound syrup with an intense, invigorating and mentholated freshness, which leaves a pleasant sensation of coolness, while being particularly aromatic.

CONCLUSIONS

This research work has deepened the concept of multiple uses of edible parts from underutilized ornamental plants and fruit tree species, demonstrating a significant, often neglected, and potential for diversifying food resources and promoting sustainability. The analysis revealed that a considerable number of species cultivated predominantly for their aesthetic value or considered "unconventional" possess remarkable nutritional and organoleptic properties, comparable to or even superior to traditional crops. One of the main strengths highlighted is the resilience of many of these species. They often adapt better to varied climatic conditions, to less fertile soils and are less susceptible to diseases and pests, thus reducing the need for intensive chemical interventions. This gives them a crucial role in the context of climate change and the need to develop more robust food systems and less dependent on external inputs.

Were identified various edible parts – from fruits and leaves, to flowers and seeds – that can be integrated into human diets, contributing to food security and nutritional diversification. The use of these resources contributes not only to an intake of vitamins, minerals and bioactive compounds, but also to a unique culinary experience, stimulating interest in local gastronomy and sustainable food practices.

However, the large-scale integration of these species into food systems requires overcoming some challenges. It is essential to continue research on the exact nutritional composition, food safety (identification of potential anti-nutritional or toxic compounds under certain conditions) and the development of optimal harvesting and processing protocols. It is also imperative to educate the public and agricultural and landscape specialists to recognize and value these resources.

In conclusion, the undoubted potential of ornamental plants and underutilized tree species to contribute to our food systems is undeniable. Through multidisciplinary approaches that combine botany, agronomy, nutrition and horticulture, we can unlock this "hidden treasure" of biodiversity. Investment in research and dissemination of knowledge will pave the way to urban and rural landscapes that are not only beautiful, but also productive, resilient and sustainable, offering multiple benefits for both the environment and human well-being. We believe that promoting the use of these species represents an important step towards a more harmonious and fruitful relationship with the plant world.

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