

Article

BIOLOGY AND SOME BENEFICIAL PROPERTIES OF PHYSALIS (*Physalis peruviana* L.)

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Abstract: The natural climatic and soil conditions of Uzbekistan are favorable in all respects for the growth and development of these unusual plants. At present, it is essential to study the bioecological characteristics of rare medicinal plants and to determine how they can be cultivated and grown in different regions of our country. Investigating the biological and ecological features of rare medicinal species and developing appropriate cultivation techniques for various territorial zones is of considerable scientific and practical importance. In this regard, the biological characteristics, growth process, and developmental stages of *Physalis peruviana* L. (physalis) were studied. The research focused on the plant's morphological and functional traits, its patterns of growth and reproduction, and its ecological significance. The article discusses how *Physalis* grows, how it reproduces, and the role it plays in ecological systems. Special attention is given to the plant's structural features and physiological functions, as well as its ability to adapt to different climatic conditions. The study also addresses its environmental impact and ecological interactions, highlighting the significance of *Physalis peruviana* L. as a promising medicinal and economically valuable crop under diverse environmental conditions.

Keywords: Peruvian ground cherries (*Physalis peruviana*) are sweet and small. The leaves are simple, alternate, and have a pollen coat. They contain vitamins A, C, iron, and phosphorus.

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1. Introduction

Relevance of the Topic. Today, the rich natural resources of the environment play a significant role in meeting various human needs. Among them, many plant species stand out due to their medicinal, nutritional, and ecological benefits. One such plant is *Physalis peruviana* L. (physalis), which attracts attention because of its unique biological characteristics and beneficial properties. Naturally distributed in tropical and subtropical regions and currently cultivated in many parts of the world, this plant is valued not only for its aesthetic appearance but also for the health-promoting qualities of its distinctive fruit.

Research Objective.

To scientifically study the biological characteristics, ecological features, and pharmacological properties of *Physalis peruviana* L. [1]. The scientific expertise on *Physalis peruviana* L., a member of the *Solanaceae* family, presents significant information on its biological, ecological, and pharmacological properties.

The study by Begmatova et al. [2] provides a comprehensive guide on medicinal plant cultivation, where *Physalis peruviana* L. is highlighted as a promising species due to its many therapeutic properties. This resource serves as a practical guide for studying how to cultivate these plants, which is essential for integrating them into both local and global markets.

Furthermore, the methodological guide by Nurmatov et al. [3] on field experiments offers important research methods for studying the bioecological characteristics of *Physalis peruviana* L. and other medicinal plants. The guide emphasizes the importance of conducting fieldwork and observing the plants personally while gathering information on their therapeutic potential. Research on the growth, development, and environmental factors affecting *Physalis peruviana* L. has provided crucial data, especially on the impact of root zone temperature and altitude.[4,5] These studies are vital for improving agricultural techniques under various ecological conditions. Further research by Khamrayeva and Begmatova [6] and Franco et al. [7] on the medicinal applications of *Physalis peruviana* L. highlights its anti-inflammatory capabilities, antioxidant content, and overall health benefits. Franco's research specifically focuses on the anti-inflammatory properties of physalis extracts, providing further validation of its significance in the healthcare field.

Moreover, comprehensive studies by Begmatova, Jumayeva, and Hasanova [8] provide deeper insights into how medicinal plants like *Physalis peruviana* L. can be used in modern medicine. Their analysis helps us understand how this plant fits into the broader landscape of medicinal plant research. Hamdamov et al. [9] focus on plant physiology, which is crucial for understanding the biological mechanisms underlying the therapeutic properties of *Physalis peruviana* L. Their research on plant growth and development is essential for improving agricultural methods and enhancing health benefits. Finally, the study by Lima et al. [10,11] also examines the external characteristics of physalis fruits, improving our understanding of the link between the plant's physical traits and its nutritional and therapeutic properties. This research is critical for developing effective marketing and utilization strategies for physalis-based products in the food sector.

2. Materials and Methods.

This paper examines the biological characteristics, beneficial properties, and therapeutic potential of *Physalis peruviana* L.. While *Physalis* is often referred to as a "small-fruited tree," it is, in fact, a herbaceous plant belonging to the Solanaceae family. The Solanaceae family includes several economically important plants such as potato (*Solanum tuberosum*), eggplant (*S. melongena*), tomato (*S. lycopersicum*), pepino (*S. muricatum*), and various types of pepper. The family also includes pharmacologically significant plants like *Atropa belladonna* and *Hyoscyamus niger*, as well as numerous ornamental plants.

3. Analysis and result

In around 1985, *Physalis* gained commercial importance in Colombia, where it was widely cultivated and sold in its natural form. Today, Colombia is the world's leading producer of physalis, followed by South Africa, and it accounts for approximately 54% of global natural fruit exports. *Physalis peruviana* L. is believed to have originated from the Andes Mountains in South America, particularly in Peru, Colombia, and Ecuador. This plant adapts to various climatic conditions and can remain in the same location for many years in Colombia. Over 20 species of this plant exist, and it is now cultivated in many countries, including Uzbekistan. Morphological Structure. The main stem of the plant is green and herbaceous, with 8–12 nodes. The leaves are simple, rounded, and 5 to 15 cm long, and up to 4 cm wide. They are arranged alternately along the stem. The flowers are solitary, growing from axillary buds, and each flower has five yellow petals. As the fruit ripens, the husk-like covering turns brown, which is the main sign of maturity. Fruit Characteristics. The fruits are small, round, and resemble berries. They range in diameter from 12.5 to 25.0 mm and weigh between 4 and 10 grams. Each fruit contains approximately 100 to 300 seeds. The plant is capable of high yields. The fruits are small, spherical, bright orange, and sweet. They are rich in vitamins A and C, as well as minerals such as iron and phosphorus, along with other biologically active compounds. Due to these properties, physalis fruits are considered functional foods [7–11]. Soil and Climatic Conditions for Growth. *Physalis* can grow in various soil types and is considered a resilient plant because of its ability to adapt to different climatic conditions, allowing it to thrive under diverse environments.

1-picture. *Physalis peruviana* L.



4. Conclusion.

Physalis peruviana L., a plant from the *Solanaceae* family, grows in tropical and subtropical regions. Its fruits are rich in essential minerals such as iron, phosphorus, and potassium, as well as vitamins A and C. The fruit's composition, abundant in antioxidants and flavonoids, makes it particularly beneficial for health. The plant's unique characteristic is its fruit, which is wrapped in a husk. It also contains biological compounds that help reduce inflammation, strengthen the immune system, and prevent various diseases. This plant is widely used in the food, medicinal, and cosmetic industries, and researchers are continuously discovering more about its health benefits each year.

REFERENCES

- [1] [M. X. Begmatova, A. A. Elmurodov, Sh. Sh. Shernazarov, A. A. Nurniyozov, "Practical Guide for Practical Classes on the Technology of Medicinal Plant Cultivation," Tashkent-2023, "Fan ziyosi."
- [2] Sh. Nurmatov, Q. Mirzajonov, A. Avliyokulov, A. Bezborodov, J. Akhmedov, Sh. Teshayev, B. Niyazaliyev, B. Khalikov, F. Khasanov, N. Mallaboev, B. Tillabekov, N. Ibragimov, Sh. Abdullaev, A. Shamsiev, "Methodical Guide on Field Experiments," UzPITI, Tashkent, 2007, p. 146.
- [3] G. Fischer, "Growth and Development in: Production, Delivery, and Export of *Physalis peruviana* L.," Unibiblos: National University of Colombia, 2000, pp. 9-26.
- [4] G. Fischer, "Effects of Root Zone Temperature and Height on the Growth, Development, and Fruit Quality of Peruvian Tomatillos (*Physalis peruviana* L.)," Ph.D. Dissertation, Faculty of Agriculture and Horticulture, Humboldt University, Berlin, 1995, p. 171.
- [5] Q. H. Hojimatov, K. Y. Yo'ldoshev, U. Sh. Shog'ulomov, O. Q. Hojimatov, "Healing Herbs: Ointments for Diseases," Tashkent, 1995, p. 24.
- [6] M. Khamrayeva, M. Begmatova, "Healing Properties and Biometrical Indicators of *Chelidonium majus* L., Introduced in Uzbekistan," *Oriental Renaissance: Innovative, Educational, Natural and Social Sciences*, vol. 2, no. 2, 2022, pp. 495-498.
- [7] L. A. Franco, et al., "Anti-inflammatory Activity of Extracts and Fractions from *Physalis peruviana* L. Berries," *Biomedica*, Bogotá, vol. 27, no. 1, pp. 110-115, 2007.
- [8] M. X. Begmatova, M. Jumayeva, G. Hasanova, "Biology and Medicinal Properties of Promising Medicinal Plants," *Education, Science, and Innovative Ideas in the World*, vol. 16, no. 5, 2023, pp. 53-57.
- [9] I. Hamdamov, E. I. Hamdamova, G. A. Suvonova, M. Begmatova, "Botany and Plant Physiology. Botany Section," Tashkent, 2017, pp. 245-247.
- [10] M. Begmatova, et al., "Technology of Cultivation of Medicinal Preparation 'Hypericum Perforatum I'," *E3S Web of Conferences*, vol. 510, p. 01020, EDP Sciences, 2024.
- [11] CSM Lima, et al., "Characteristics of *Physalis* Fruits Related to Skin Color," in *Congresso Brasileiro de Fruticultura*, 20, 2008.