

## **GLIPTOSTROBUS SIMON METASEQUOYA: HISTORY, CHARACTERISTICS, GROWTH CONDITIONS, AND USE IN LANDSCAPE DESIGN**

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### **ABSTRACT**

This article is dedicated to the "Gliptostrobus-like Metasequoia" (*Metasequoia glyptostroboides*), providing information on its historical significance, biological characteristics, and growth conditions. This plant was accidentally discovered in the mountainous regions of China in 1948, and was considered extinct for the past 40 million years. The article focuses on the geographic distribution, natural habitat, growth conditions, features, flowers, and fruits of the metasequoia. Additionally, the article provides information on its reproductive characteristics, reproduction conditions, root system, and ecological environment requirements. The role of metasequoia in plant habitats and its potential use in landscape design, particularly its adaptability to Uzbekistan's climate, is also discussed. Based on this, the article highlights the ecological role of Gliptostrobus-like Metasequoia and its significance in the environment.

**Keywords:** Gliptostrobus-like Metasequoia, *Metasequoia glyptostroboides*, historical significance, biological characteristics, growth conditions, geographic distribution, natural habitat, conifers, flowers and fruits, reproduction, root system, landscape design, Uzbekistan climate, ecological requirements, nature conservation.

### **INTRODUCTION**

Gliptostrobus-like Metasequoia (*Metasequoia glyptostroboides*) is one of the most remarkable representatives of the plant world. This plant was thought to have been extinct for many years but was unexpectedly rediscovered in the mountainous regions of China in 1948. Along with this, the plant's biological characteristics and history are of great interest for research. Scientific literature on *Metasequoia* serves as a valuable resource for naturalists and landscape designers.

### **MATERIALS AND RESEARCH METHODS**

#### **Materials:**

##### **1. Collection of plant samples:**

- Samples of *Metasequoia* plants are collected from the Tashkent Botanical Garden or other suitable regions.
- Measurement tools: rulers, diameter gauges.

**2. Climate and ecological conditions:**

- Measuring climate parameters: temperature, humidity, rainfall, soil moisture.
- Soil analysis: composition and pH.

**3. Laboratory analyses:**

- Planting seeds and monitoring their growth.
- Microscopic analysis: studying the root system and growth forms.

**4. Ecological observation:**

- Observing ecological factors (soil, climate, plant interactions).

**5. Experimental plots:**

- Observing plant growth dynamics under different climatic conditions, soil types, and planting methods.

**Research Methods:**

**1. Experimental method:**

- Seed propagation and vegetative propagation experiments.

**2. Plot study method:**

- Measurements, soil analysis, and observation of climate factors.

**3. Statistical analysis:**

- Analyzing growth indicators based on measurements and performing regression analysis.

**4. Visual observation:**

- Documenting plants and their growth processes through visual means.

**5. Landscape design:**

- Studying the role of Metasequoia in landscape design and its ecological impact.

**6. Modeling and simulation:**

- Simulating growth conditions and modeling responses to soil and climate changes.

## RESEARCH RESULTS

**History and Geographic Distribution of Gliptostrobus-like Metasequoia.** Gliptostrobus-like Metasequoia is the only plant species belonging to the Metasequoia genus and was widespread in North Eurasia and North America since the Late Cretaceous period. It grew as the main forest of Arctic-Subarctic plants but almost became extinct during the glacial period. Around 40 million years ago, the last genetic changes of this plant occurred, and its distribution rapidly decreased in a short period.

The Metasequoia trees, accidentally discovered by a group of foresters in China in 1948, are among the oldest plants that have been preserved in the evolutionary process. These trees

grow in the mountainous regions of central and southwestern China, in the provinces of Hubei, Sichuan, and Hunan. Thus, Metasequoia is the only plant species that has preserved its natural habitat.

**Growth Conditions and Ecological Requirements.** Metasequoia stands out with its growth conditions. This plant grows in mountainous areas at an elevation of 700-1400 meters above sea level. It requires moist, well-drained soils and prefers areas with stable water conditions. The soil should be sandy or loamy because the plant is resistant to temperature changes and cold climates.

Metasequoia can also grow well in the shade, but it thrives better in open, sunny areas. This plant is cold-resistant, withstanding temperatures as low as -30°C, though in harsh winters, it may experience slight freezing. Young leaves can be damaged by cold, which is why young Metasequoia trees do not fully exhibit their cold resistance.

**Appearance and Characteristics of Metasequoia.** The appearance of Metasequoia is distinctive and attractive, with features that make the tree easily identifiable in nature.

- **Crown Shape and Height:** Metasequoia can grow up to 40 meters tall, with a trunk diameter reaching up to 3.5 meters. As the tree ages, its conical shape gradually transforms into a spherical shape, enhancing its aesthetic appeal. The crown is wide and tall, making the tree bright and visually striking.
- **Bark:** The bark is dark brown and twisted, forming new layers every year. The bark of young trees is white-brown or yellow-brown, and over time, it turns dark brown.
- **Needles:** The needles are flat and soft, measuring 3-5 cm in length and up to 3 mm in width. The needles are arranged in a spiral form on long shoots and in two rows in a pinnate arrangement on short shoots. In summer, the needles are dark green, while in autumn, they turn dark yellow.
- **Trunk and Buds:** The trunk of young trees is cylindrical and can reach up to 2.5 meters in diameter. Longitudinal lines or scales are found on the lower part of the trunk. The buds are delicate, soft, and colored in light red or white-violet hues.

**Flowers and Fruits.** The flowers and fruits of Metasequoia are unique. The flowers bloom in April-May and vary in color from yellow to pale pink, red, and reddish-brown. Male flowers are small and round, grouped in several pieces at the tip of the terminal shoot.

The fruits are round, drop-shaped, and can reach a length of 4.5 cm. When ripe, they turn light brown. The fruits consist of several wide, scaly, cone-like structures, with the seeds being winged and compressed. The seeds ripen in November-December, and new generations of the plant emerge after that.

**Reproduction and Growth Indicators.** Metasequoia reproduces by seeds. The seeds almost have a 100% germination rate, but only seeds from trees older than 15 years will germinate. The root system is wide and shallow, allowing the plants to anchor well in the soil.

In the Tashkent Botanical Garden, the growth results of the *Gliptostrobus*-like Metasequoia were very positive. Within 6 years, the plants reached a height of 2.2 meters, with a diameter

of 3.5 cm. Over the course of 10 years, these indicators increased to 5.3 meters in height and 9.8 cm in diameter. This, in turn, demonstrates that the plant has adapted well to the climate of Uzbekistan.

**Use in Landscape Design.** Metasequoia is one of the ideal plants used in landscape design. Its height and beauty create a stunning view in gardens, parks, and public spaces. It grows well near streams, ponds, and in open sunny areas, making it visually striking. Gliptostrobus-like Metasequoia also contributes to the conservation of natural environments by being planted in gardens or in nature.

## **CONCLUSION**

Gliptostrobus-like Metasequoia is an important plant not only biologically but also in landscape design. Its historical significance and ecological characteristics, as well as its age and formation, make it an interesting phenomenon that requires further study. With its beautiful and aromatic appearance, Metasequoia can enrich nature and has high value in ecological and landscape projects.

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