# WONDERS UNDER THE MICROSCOPE

VOLUME-1| ISSUE-10

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*Welcome to*

# WONDERS UNDER THE MICROSCOPE

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# your Question of the last Month

Which is the largest flowering plant?

Here's the Answer

Rafflesia arnoldii

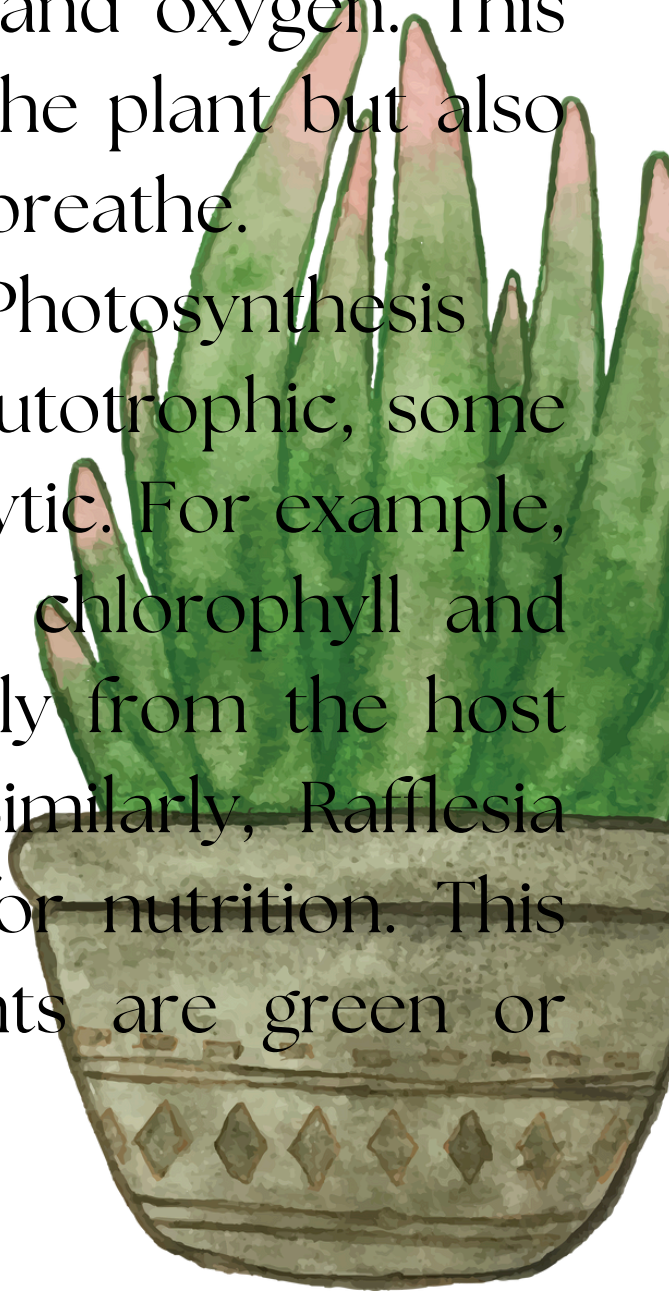
# Plant kingdom

1) Plants Make Their Own Food Through Photosynthesis

Most plants are autotrophs. They use chlorophyll in their chloroplasts to capture light energy and convert carbon dioxide and water into glucose and oxygen. This process not only feeds the plant but also produces the oxygen we breathe.

2) Some Plants Don't Do Photosynthesis

While most plants are autotrophic, some are parasitic or saprophytic. For example, Cuscuta (dodder) lacks chlorophyll and absorbs nutrients directly from the host plant using haustoria. Similarly, Rafflesia relies on other plants for nutrition. This shows that not all plants are green or photosynthetic.



3) Plants “Breathe” Through Tiny Pores Called Stomata

Plants have tiny openings on their leaves called stomata that regulate gas exchange. They open and close to take in $CO_2$ for photosynthesis and release $O_2$. They also control water loss through transpiration, which helps pull water up from roots via the xylem.

4) Bryophytes Are Called “Amphibians of the Plant Kingdom”

Bryophytes like mosses and liverworts need water for reproduction because their male gametes (sperm) are motile and swim to reach the egg. However, they also grow on land, making them evolutionary bridges between algae and fully terrestrial plants.

5) Some Plants Can Survive Extreme Conditions

Desert plants (xerophytes) like cacti have thick cuticles, reduced leaves (spines), and CAM photosynthesis to conserve water. On the other hand, hydrophytes (like water lilies) have air-filled tissues (aerenchyma) to float and exchange gases. These adaptations show how plants evolved to thrive in diverse habitats.

6) Largest and Smallest Plants Are Both Fascinating

- The largest flower belongs to Rafflesia arnoldii, which can grow over 1 meter wide.
- The tallest plants are redwood trees (Sequoia sempervirens), reaching over 100 meters.
- The smallest flowering plants are Wolffia species (duckweed), barely 1 mm wide.
- These extremes highlight plant diversity.

7) Plants Reproduce in Multiple Ways

Plants show a variety of reproductive strategies:

- Asexual: vegetative propagation (like potato tubers, Bryophyllum leaf buds).
- Sexual: involves gametes and alternation of generations.
- Double fertilization: unique to angiosperms; one sperm fertilizes the egg, the other forms endosperm.

8) Plants Communicate Chemically

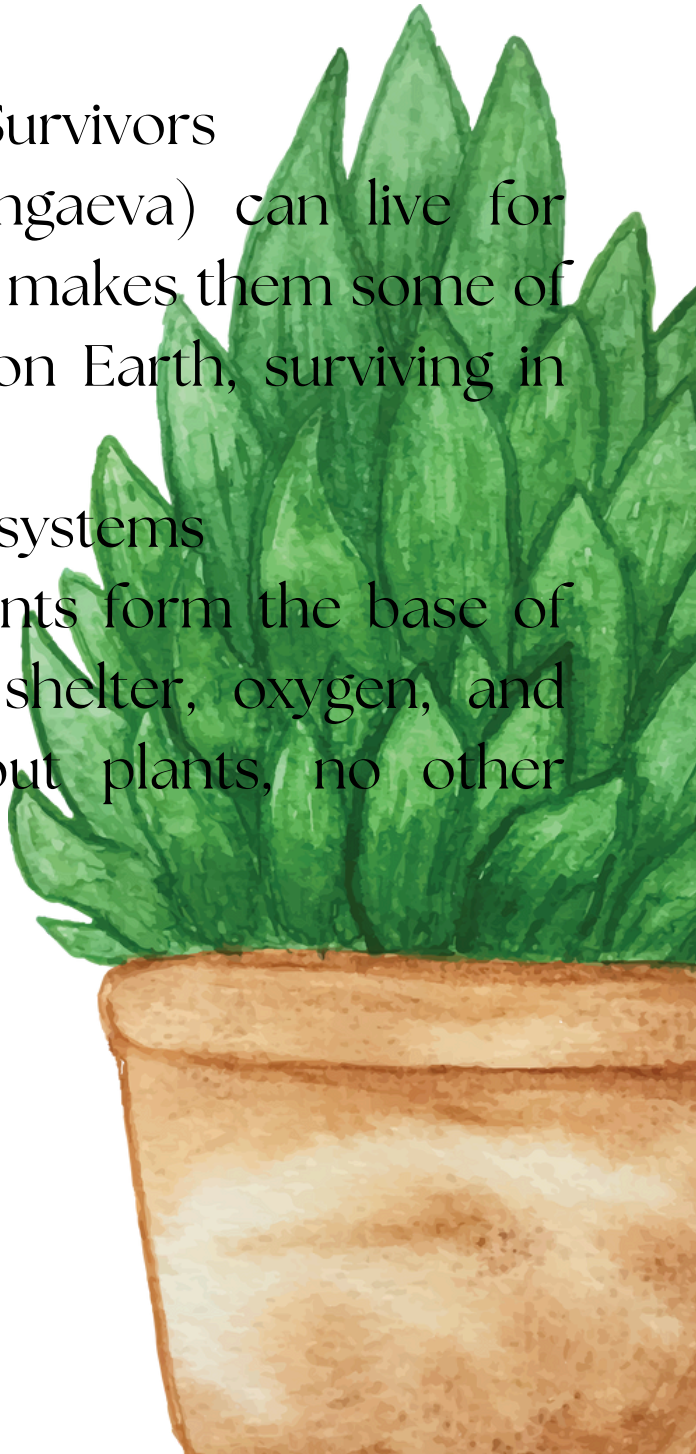
Some plants release volatile chemicals when attacked by herbivores, which warn nearby plants to activate their defenses (like producing bitter compounds). For example, acacia trees release ethylene gas that triggers defense responses in nearby acacias.

9) Oldest Plants Are Ancient Survivors

Bristlecone pines (Pinus longaeva) can live for more than 4,000 years. This makes them some of the oldest living organisms on Earth, surviving in harsh mountain conditions.

10) Plants Support Entire Ecosystems

Through photosynthesis, plants form the base of food chains. They provide shelter, oxygen, and nutrients for all life. Without plants, no other kingdom could survive.



11) Plants Perform Phototropism

Many plants bend toward light because of auxin, a plant hormone. Auxin accumulates on the shaded side of a plant stem, causing those cells to elongate more and the plant to bend toward the light — an adaptation to maximize photosynthesis.

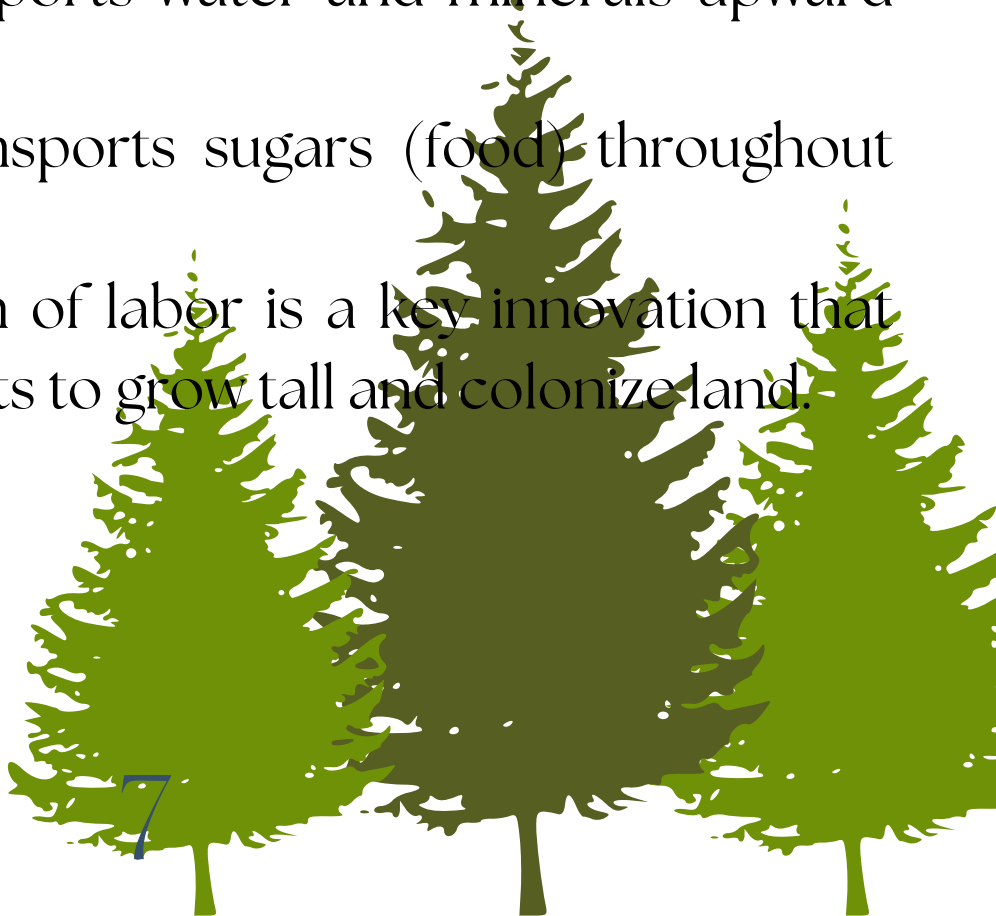
12) Some Plants Are Carnivorous

Plants like Nepenthes (pitcher plant), Drosera (sundew), and Dionaea (Venus flytrap) trap and digest insects. They still do photosynthesis but live in nutrient-poor soils and supplement nitrogen by digesting animal prey with special enzymes.

13) Plants Have a Vascular Transport System

Higher plants have two main vascular tissues:

- Xylem: transports water and minerals upward from roots.
- Phloem: transports sugars (food) throughout the plant.
- This division of labor is a key innovation that allowed plants to grow tall and colonize land.



14) Seeds Can Survive for Centuries

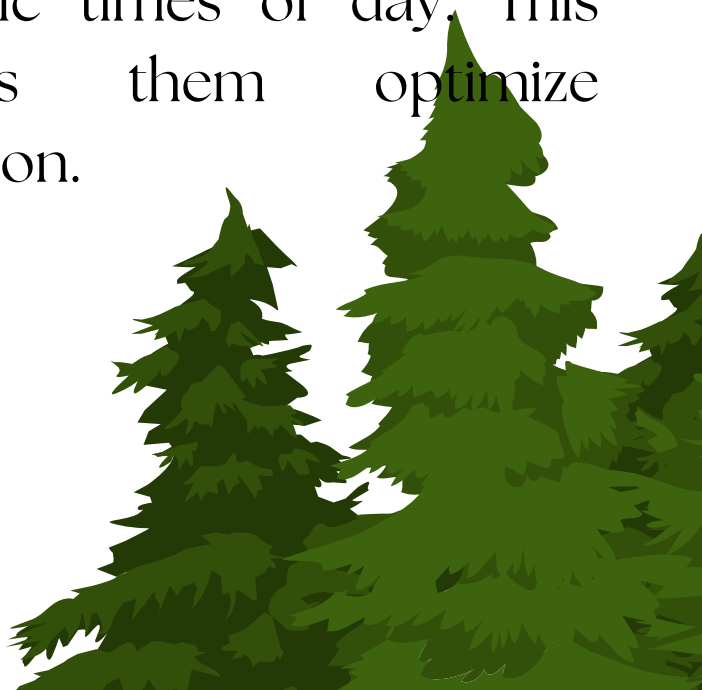
Some seeds remain viable for extremely long periods. For example, date palm seeds over 2,000 years old were germinated successfully in Israel. Seeds have protective coats and store food, enabling them to survive droughts and cold until conditions improve.

15) Some Plants Reproduce Without Seeds or Flowers

Non-flowering plants like ferns, mosses, and horsetails reproduce by spores instead of seeds. Spores are tiny, single-celled, and can disperse widely through air or water.

16) Plants Have Circadian Rhythms

Even without light cues, many plants maintain internal 24-hour cycles. For example, some flowers open and close at specific times of day. This biological clock helps them optimize photosynthesis and pollination.



# Thank you for reading Volume 1

# Thank you

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