

Autotrophic Nutrition In Plants 1 LR

Autotrophic Nutrition in Plants Objective To understand autotrophic nutrition in plants, all living organisms, like plants, animals, and humans, require food for their survival. Green plants make their own food, and so are called autotrophs. These plants make their food using sunlight, carbon dioxide, water, and chlorophyll.

If we closely examine a leaf, we will notice numerous structures inside it. These structures, called chloroplasts, are green in color due to the presence of a green pigment called chlorophyll. The chlorophyll helps in absorbing the sun's energy, which is needed for the preparation of food by plants.

The underside of a leaf has tiny pores called stomata. The stomata are surrounded by two kidney-shaped cells called guard cells. During daytime, in the presence of sunlight and moisture, the guard cells absorb ions and sugar from the surrounding cells of the leaf due to which they start swelling.

This absorption by the guard cells and the resulting swelling leads to the opening of the stomata, which, in turn, helps the leaf to absorb carbon dioxide from the atmosphere. Carbon dioxide is needed by plants for preparing their food. Now let's learn how water is transported in plants.

Soil is rich in water and minerals. These are absorbed by the root hair present in the roots. The water and minerals reach the stem, which has pipe-like vessels called xylem.

The xylem transports the water and minerals to the leaves. After the sunlight, carbon dioxide, water, and minerals have reached the leaves. The leaves, known as the food factories of the plants, start the synthesis of food.

The chlorophyll utilizes the sun's energy to combine water and carbon dioxide to form glucose and oxygen. The glucose formed is the food for the plants, and this process by which plants make their food is known as photosynthesis. The food

synthesized by the leaves is transported by the phloem tissues of the stem to the other parts of the plant.

The food is then converted into starch and stored in the roots, stem, and leaves of the plant, whereas the oxygen is released into the atmosphere from the open stomata. To summarize, all living organisms, like plants, animals, and humans, require food for their survival. Green plants can make their own food, and for this reason, they are known as autotrophs.

The process by which the green leaves of plants make food, with the help of sunlight, water, and carbon dioxide, is known as photosynthesis.

Summary: Autotrophic Nutrition in Plants

All living organisms, including **plants, animals, and humans**, require food for survival. **Green plants** can make their own food through a process called **photosynthesis**, making them **autotrophs**.

Key Components of Photosynthesis:

1. **Chlorophyll & Chloroplasts** – Leaves contain **chloroplasts**, which have a **green pigment called chlorophyll**. This **absorbs sunlight** for food production.
2. **Stomata & Carbon Dioxide Absorption** – The **underside of leaves** has **tiny pores called stomata**, controlled by **guard cells**, which open to **absorb carbon dioxide** from the air.
3. **Water & Minerals from Soil** – **Roots absorb water and minerals** from the soil, which travel through **xylem (pipe-like vessels)** in the **stem** to reach the leaves.
4. **Photosynthesis Process** – **Chlorophyll absorbs sunlight** to combine **water and carbon dioxide**, forming **glucose (food) and oxygen**.
5. **Food Storage & Oxygen Release** – The food (**glucose**) is transported by **phloem** to other parts of the plant and stored as **starch** in **roots, stem, and leaves**. The **oxygen** produced is **released into the air through stomata**.

Photosynthesis Equation:

$$\text{Sunlight} + \text{Carbon Dioxide} + \text{Water} \rightarrow \text{Glucose} + \text{Oxygen}$$

Quiz Questions

1. **Which pigment in leaves helps absorb sunlight for photosynthesis?**
 - (A) Hemoglobin
 - (B) Melanin
 - (C) Chlorophyll ☒
 - (D) Carotene
2. **What is the function of stomata in a leaf?**
 - (A) Absorbing minerals
 - (B) Releasing oxygen and absorbing carbon dioxide ☒
 - (C) Storing food
 - (D) Transporting water
3. **Which plant tissue transports water and minerals from roots to leaves?**
 - (A) Phloem
 - (B) Stomata
 - (C) Xylem ☒
 - (D) Guard cells
4. **What is the main product of photosynthesis that provides energy to plants?**
 - (A) Oxygen
 - (B) Starch
 - (C) Glucose ☒
 - (D) Carbon dioxide