



Pelagia Research Library

Asian Journal of Plant Science and Research, 2022, 12(9)



## Leaves Catch Light in Order to Manufacture Nutrients Jeff Harvey\*

*Department of Plant Biochemistry, Regensburg University, Regensburg, Germany.*

**\*Corresponding author:** Jeff Harvey, Department of Plant Biochemistry, Regensburg University, Regensburg, Germany; E-mail: [Harvey\\_J@Ned.de](mailto:Harvey_J@Ned.de)

**Received date:** June 25, 2022, Manuscript No. AJPSKY-22-13853; **Editor assigned date:** June 28, 2022, PreQC No. AJPSKY-22-13853 (PQ); **Reviewed date:** July 13, 2022, QC No. AJPSKY-22-13853; **Revised date:** August 26, 2022, Manuscript No. AJPSKY-22-13853 (R); **Published date:** September 05, 2022, DOI: 10.36648/2249-7412.22.12.9.315

**Citation:** Harvey J (2022) Leaves Catch Light in Order to Manufacture Nutrients. Asian J Plant Sci Res Vol.12 No.9:315.

---

### Introduction

Plant physiology is a sub discipline of botany concerned with the functioning, or physiology of plants. Closely related fields include plant morphology (structure of plants), plant ecology (interactions with the environment), photochemistry (biochemistry of plants), cell biology, genetics, biophysics and molecular biology. Fundamental processes such as photosynthesis, respiration, plant nutrition, plant hormone functions, tropisms, nastic movements, photoperiodism, photo morphogenesis, circadian rhythms, environmental stress physiology, seed germination, dormancy and stomata function and transpiration, both parts of plant water relations, are studied by plant physiologists.

The field of plant physiology includes the study of all the internal activities of plants those chemical and physical processes associated with life as they occur in plants. This includes study at many levels of scale of size and time. At the smallest scale are molecular interactions of photosynthesis and internal diffusion of water, minerals and nutrients. At the largest scale are the processes of plant development, seasonality, dormancy and reproductive control. Major sub disciplines of plant physiology include photochemistry (the study of the biochemistry of plants) and phytopathology (the study of disease in plants). The scope of plant physiology as a discipline may be divided into several major areas of research.

### Description

First, the study of photochemistry (plant chemistry) is included within the domain of plant physiology. To function and survive, plants produce a wide array of chemical compounds not found in other organisms. Photosynthesis requires a large array of pigments, enzymes and other compounds to function. Because they cannot move, plants must also defend themselves chemically from herbivores, pathogens and competition from other plants. They do this by producing toxins and foul tasting or smelling chemicals. Other compounds defend plants against disease, permit survival during drought and prepare plants for dormancy, while other compounds are used to attract pollinators or herbivores to spread ripe seeds.

Secondly, plant physiology includes the study of biological and chemical processes of individual plant cells. Plant cells have a number of features that distinguish them from cells of animals and which lead to major differences in the way that plant life behaves and responds differently from animal life. For example, plant cells have a cell wall which restricts the shape of plant cells and thereby limits the flexibility and mobility of plants. Plant cells also contain chlorophyll, a chemical compound that interacts with light in a way that enables plants to manufacture their own nutrients rather than consuming other living things as animals do. Thirdly, plant physiology deals with interactions between cells, tissues and organs within a plant. Different cells and tissues are physically and chemically specialized to perform different functions. Roots and rhizoids function to anchor the plant and acquire minerals in the soil. Leaves catch light in order to manufacture nutrients. For both of these organs to remain living, minerals that the roots acquire must be transported to the leaves, and the nutrients manufactured in the leaves must be transported to the roots. Plants have developed a number of ways to achieve this transport, such as vascular tissue and the functioning of the

various modes of transport are studied by plant physiologists. Fourthly, plant physiologists study the ways that plants control or regulate internal functions. Like animals, plants produce chemicals called hormones which are produced in one part of the plant to signal cells in another part of the plant to respond. Many flowering plants bloom at the appropriate time because of light-sensitive compounds that respond to the length of the night, a phenomenon known as photoperiodism. The ripening of fruit and loss of leaves in the winter is controlled in part by the production of the gas ethylene by the plant. Finally, plant physiology includes the study of plant response to environmental conditions and their variation, a field known as environmental physiology. Stress from water loss, changes in air chemistry, or crowding by other plants can lead to changes in the way a plant functions. These changes may be affected by genetic, chemical and physical factors.

Plant hormones, known as Plant Growth Regulators (PGRs) or phytohormones, are chemicals that regulate a plant's growth. According to a standard animal definition, hormones are signal molecules produced at specific locations, which occur in very low concentrations, and cause altered processes in target cells at other locations. Unlike animals, plants lack specific hormone producing tissues or organs. Plant hormones are often not transported to other parts of the plant and production is not limited to specific locations.

Plant hormones are chemicals that in small amounts promote and influence the growth, development and differentiation of cells and tissues. Hormones are vital to plant growth; affecting processes in plants from flowering to seed development, dormancy, and germination. They regulate which tissues grow upwards and which grow downwards, leaf formation and stem growth, fruit development and ripening, as well as leaf abscission and even plant death. The most important plant hormones are Abscissic Acid (ABA), auxins, ethylene, gibberellins and cytokinins, though there are many other substances that serve to regulate plant physiology.

Many flowering plants use the pigment phytochrome to sense seasonal changes in day length, which they take as signals to flower. This sensitivity to day length is termed photoperiodism. Broadly speaking, flowering plants can be classified as long day plants, short day plants, or day neutral plants, depending on their particular response to changes in day length. Long day plants require a certain minimum length of daylight to start flowering, so these plants flower in the spring or summer. Conversely, short day plants flower when the length of daylight falls below a certain critical level. Day neutral plants do not initiate flowering based on photoperiodism, though some may use temperature sensitivity (vernalization) instead.

### Conclusion

Although a short day plant cannot flower during the long days of summer, it is not actually the period of light exposure that limits flowering. Rather, a short day plant requires a minimal length of uninterrupted darkness in each 24 hours period before floral development can begin. It has been determined experimentally that a short day plant does not flower if a flash of phytochrome activating light is used on the plant during the night.