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Perspective

A Short Note on Plant Physiology

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DESCRIPTION

Plant physiology is a branch of botany that studies how plants work, or their physiology. Plant morphology (shape), plant ecology (interactions with the environment), phytochemistry (biochemistry of plants), cell biology, genetics, biophysics, and molecular biology are all closely connected sciences. Plant physiologists research fundamental processes like photosynthesis, respiration, plant nutrition, plant hormone functions, tropisms, nastic movements, photoperiodism, photomorphogenesis, circadian rhythms, environmental stress physiology, seed germination, dormancy, and stomata function, which are both parts of plant water relations.

Plant physiology is the study of all of a plant's internal functions, including the chemical and physical processes that are connected with life in plants. This involves research on a wide range of size and time scales. Molecular interactions of photosynthesis and internal diffusion of water, minerals, and nutrients occur at the smallest scale. Plant development, seasonality, dormancy, and reproductive control are all activities that occur on a huge scale. Phytochemistry (the study of plant biochemistry) and phytopathology are two major subdisciplines of plant physiology (the study of disease in plants). Plant physiology as a discipline can be broken down into three primary research topics.

Plant physiology, third, is concerned with the interactions of cells, tissues, and organs inside a plant. Physically and chemically, different cells and tissues are specialised to fulfil different roles. The purpose of the roots and rhizoids is to anchor the plant and acquire minerals from the soil. In order to create nutrition, leaves capture light. Minerals from the roots must be delivered to the leaves, and nutrients generated in the leaves must be transported to the roots, for both of these organs to remain alive. Plants have created a variety of mechanisms to perform this transport, such as vascular tissue, and plant physiologists study how these varied forms of transport work.

Plant physiologists, on the other hand, investigate how plants govern and regulate their internal activities. Hormones are created in one area of the plant to tell cells in another section of the plant to respond, just as they are in mammals. Because of light-sensitive chemicals that respond to the length of the night, many blooming plants bloom at the right time, a phenomenon known as photoperiodism. The plant's production of the gas ethylene regulates the ripening of fruit and the loss of leaves in the winter.

Finally, environmental physiology is a branch of plant physiology that studies how plants respond to different environmental situations and how they change. Water loss, changes in air chemistry, and crowding by other plants can all cause a plant's function to change. Genetic, chemical, and physical factors may all influence these alterations. Hormones and other growth regulators are produced by plants to indicate physiological responses in their tissues. They also create light-sensitive chemicals like phytochrome, which help to induce growth or development in response to environmental signals.

Plant physiology is an important topic in horticulture and agriculture, as well as food science, when it comes to fruits, vegetables, and other consumable sections of plants. Climate needs, fruit drop, nutrition, ripening, and fruit set are among the topics researched. The study of plant physiology, which includes themes like optimal planting and harvesting periods, post-harvest storage of plant products for human consumption, and the creation of secondary goods like pharmaceuticals and cosmetics, is also important in the production of food crops. Crop physiology takes a step back and examines an entire field of plants rather than individual plants. Crop physiology studies how plants interact with one another and how to maximise outcomes such as food production by controlling factors like planting density.

Plants, like mammals, fungi, bacteria, and even viruses, are made up of the same chemical elements as all other life forms: carbon, oxygen, hydrogen, nitrogen, phosphorus, sulphur, and so on. Only the specifics of their chemical architectures differ. Plants develop a broad assortment of chemical molecules with unique qualities that they use to adapt with their environment, despite their fundamental similarities. Plants employ pigments to absorb or detect light, and people extract them to use in dyes. Other plant products could be used to make economically valuable rubber or biofuel. Plant chemicals with pharmacological activity,

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such as salicylic acid, which is used to make aspirin, morphine, and digoxin, are among the most well-known. Phytopathology, the study of plant illnesses and the ways in which plants resist or cope with infection, is one of the most economically important areas of research in environmental physiology. Plants are vulnerable to the same pathogens that affect animals, such as viruses, bacteria, and fungus, as well as physical invasion by insects and roundworms.

The discovery of Bordeaux mixture in the nineteenth century was one of the most significant developments in the control of plant disease. The mixture, which consists of copper sulphate and lime, is the first known fungicide. The mixture was used to prevent the spread of downy mildew, which was threatening to destroy the French wine industry.