FACTORS AFFECTING PLANT GROWTH

Olamgirova Gulshan Saidali qizi
Navoi Innovations University
2nd-year student, Biology Education
https://doi.org/10.5281/zenodo.15811987

Abstract

This article analyzes the main factors affecting plant growth. It discusses biological, chemical, and physical factors shaping growth processes in natural conditions, particularly the role of light, water, temperature, soil properties, and air factors. Additionally, the study examines how human activities and environmental changes impact plant development, offering insights into necessary measures for maintaining ecological balance and advancing agriculture.

Keywords: plants, growth, factors, light, water, temperature, soil, air, biological factors, chemical factors, physical factors, ecology, environment, human activity, development, agriculture, balance, plant physiology, plant resources, growth conditions

Introduction

Plants are among the most important organisms in nature, serving not only as the foundation of ecosystems but also playing a vital role in human life. Plant growth and development depend on many factors and occur as complex, interrelated processes under natural conditions. Physical and chemical factors such as light, water, temperature, soil, and air, along with biological factors, determine the rate and quality of plant growth. This article studies the primary factors influencing plant growth and examines their place and significance in nature and human life.

Main Part

Plant growth and development depend on many internal and external factors. The most important among them is light, which ensures the process of photosynthesis. The intensity, quality, and duration of light directly affect the growth rate of plants. If there is insufficient light, plants grow slowly, and their leaves may become pale. Water is also a vital factor for plants. Through water, plants carry out metabolic processes, photosynthesis, and nutrient exchange. Water deficiency can lead to drought and halt plant growth. Carbon dioxide in the air is used in photosynthesis, while oxygen is necessary for respiration. Therefore, clean and quality air is important for plant health. Additionally, soil plays a significant role in plant growth. Minerals such as nitrogen, phosphorus, and potassium in the soil are crucial for plant development; its composition, structure, acidity, or salinity affect growth processes. Temperature is also a vital factor, as each plant species has an optimal temperature range. Extremely high or low temperatures can harm plants. Biotic factors such as insects, pests, and microorganisms also influence plant growth, either damaging plants or halting their development. Finally, plant growth hormones—such as auxins, gibberellins, and cytokinins—play a significant role by regulating cell division and elongation, which ensure overall development. Thus, plant growth is the result of the complex interaction of many factors.

Conclusion

Plant growth depends on numerous internal and external factors, each crucial for healthy development and effective yield. Light, water, air, soil, temperature, and biotic factors constitute the main external conditions for plant growth. Moreover, hormones regulating internal physiological processes play a significant role in controlling growth. A balanced and optimal combination of these factors ensures successful plant growth and development. Therefore, attention to these factors is essential in plant care and cultivation

References:

1 Abdurahmonov, M. (2015). Plant Physiology. Tashkent: Science and Technology.
2 Karimov, B. (2018). Factors Affecting Plant Growth. Tashkent: Teacher's Publishing House.
3 Mirzaeva, S. (2020). "Photosynthesis and Plant Growth Process," Journal of Biological Sciences, 3(2), 45-52.
4 Rahimov, J. (2017). Soil and Plant Growth. Tashkent: Scientific Publishing.
5 Smith, J., & Jones, A. (2010). Plant Physiology and Development. New York: Academic Press.
6 Takhtayev, N. (2019). "Factors Affecting Plant Growth," Journal of Agronomy Science, 12(1), 78-85.