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Commentary

Bio Chemical and Secondary Metabolites Uses

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ABOUT THE STUDY

Biochemical or biological chemistry is the study of chemical processes within and relating to living organisms. A sub-discipline of both chemistry and biology, biochemistry may be divided into three fields: structural biology, enzymology and metabolism. Plants are constantly interacting with their surroundings, which are always changing as plants lack mobility they have evolved several complex defense systems to cope with the changing environment, which includes a vast range of chemical substances. Furthermore, the connection of chemicals between plants and the surroundings is intermediated, mostly through the several chemical productions which serve biological functions as a plastic adaptive response to the environment. Because they are not directly engaged in development and growth, these chemical constituents are referred to as secondary metabolites. As a result, plants are the natural source of a vast variety of biosynthesis, which is derived from secondary metabolites.

Furthermore, this metabolite has been utilized by humans for medicinal purposes since ancient times and is the foundation for many contemporary pharmaceutical medicines. According to the World Health Organization WHO, about 80% of the world's population relies on plant-based chemical constituents for their primary health care. Moreover, 42 % of the top-selling medicines on the market are derived directly from natural sources or entities generated from plant items throughout the world. SMs biosynthesis begins with fundamental processes like shikimic acid or glycolysis biosynthesis and then expands according to cell type, developing stage, and ecological stimuli. These types of chemicals are extensively dispersed in diverse plant tissues, cells, and organs. On the other hand, various medicinal plant cells, tissues, and organs may have diverse medicinal characteristics at different stages of development.

There are differences in chemical component composition even within the same species. These traits are linked to genetic diversity and, in particular, to variations in growing circumstances. Moreover, the synthesis of these metabolites is frequently tightly controlled and, in most cases, limited to certain plant tissues or developmental phases in reaction to an environmental stimulus. Due to various abiotic and biotic stressors, the plant's potential to generate these metabolites is countless. Temperature, humidity, incident light, nutrition availability, heavy metals, water, and soil salinity are examples of abiotic stressors. Biotic stress, on the other hand, comprises bacteria, fungus, insects, and viruses, among other living things. Stress-induced genetic or protein changes have been documented, which cause a significant alteration in the metabolite reservoir of the affected plants. The present study is a comprehensive elucidation of the role of secondary metabolites in plants with special reference to plants under various abiotic and biotic stresses.

These metabolites perform a diverse range of functions in plants. Two types of metabolites are produced by the plants refers as primary and secondary metabolites. Primary metabolites directly are involved in the growth and development of the plant. It is derived from various pathways such as the glycolysis, TCA cycle, and shikimate pathway. They also function as precursors for secondary metabolite production. Secondary metabolites do not directly involve in the primary growth of the plant but they act as a defence mechanism system during the challenging and changing environment. Production of secondary metabolites help in coping with stressful constraints and it also involves in the production of diverse form of chemicals compound and connections in structural and functional stability *via* signaling and route mechanisms. Plant secondary metabolites are mainly classified into three group's phenolics, terpenoid, and nitrogen-containing compounds which are all involved in environmental adaptation and stress tolerance.

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