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Commentary Article

Importance of Secondary Metabolites in Plants

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COMMENTARY ARTICLE

The vast and versatile pharmacological impacts of medicinal plants are essentially reliant upon their phytochemical constituents. In general, the phytochemical constituents of plants are categorized under two classifications dependent on their part in essential metabolic cycles, specifically primary and secondary metabolites. Primary plant metabolites are associated with fundamental life functions; hence, they are more or less similar in every living cell.

Then again, secondary plant metabolites are results of subsidiary pathways. The therapeutic impact of herbals or medicinal plants is oriented towards the secondary plant metabolites. Secondary plant metabolites assumed a significant part in alleviating several aliments in the traditional medication and folk uses.

In modern medicine, they provided lead compounds to the production of medications for treating different illnesses from migraine to malignant growth. Secondary plant metabolites are characterized by their chemical structures into different classes.

Secondary plant metabolites are various chemical compounds produced by the plant cell through metabolic pathways derived from the primary metabolic pathways.

Secondary metabolites have shown to have different biological impacts, which give the scientific base to the utilization of herbs in the traditional medication in numerous ancient communities.

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They have been depicted as antibiotic, antifungal and antiviral and in this manner can protect plants from pathogenic microorganisms.

Furthermore, they comprise significant UV absorbing compounds, thus preventing leaf damage from the light. A few herbs, for example, clover or alfalfa were seen as forage grasses that can express estrogenic properties and interact with fertility of animals.

They initiate flowering, fruiting and abscission, maintain perennial growth or signal deciduous behaviour. They act as antimicrobials and perform the role of attractants or, on the other hand, as repellents. Phenolics presumably comprise the largest group of plant secondary metabolites.

They are widespread in plants where they contribute essentially to the colour, taste and flavour of numerous herbs, food sources and beverages. A few phenolics are valued pharmacologically for their anti-inflammatory activities, for example, quercetin or antihepatotoxic properties such as silybin.

Alkaloids exhibit a different group of pharmacological activities including analgesia, local anesthesia, cardiac stimulation, respiratory stimulation and relaxation, vasoconstriction, muscle relaxation and toxicity, as well as antineoplastic, hypertensive and hypotensive properties.

The activity of alkaloids against herbivores, toxicity in vertebrates, cytotoxic action, the molecular targets of alkaloids, mutagenic or carcinogenic action, antibacterial, antifungal, antiviral and allelopathic properties have been accounted for. Numerous alkaloids are adequately harmful to animals to cause death when consumed. Nicotine and anabasine are utilized as insecticides.

Saponins are widespread among plants and have been isolated from all plant parts like leaves, stems, roots bulbs, blossoms and fruits.

Despite the fact that they are concentrated in the roots of many species, for example, *Digitalis purpurea* (foxglove), *Dioscorea villosa* (wild sweet potato), *Eleutherococcus senticosus* (Siberian ginseng), *Gentiana lutea* (gentian), *Glycyrrhiza spp*. (licorice) and *Panax ginseng* (Korean ginseng). Saponins have exhibited various pharmacological properties. A few saponins have antitumor, piscicidal, molluscicidal, spermicidal, narcotic, expectorant and analgesic properties.

Terpenes are the largest and most diverse group of plant secondary metabolites. Lipids involve a group of normally occurring molecules that include fixed oils, waxes, essential oils, sterols, fat- soluble vitamins, (for example, vitamins A, D, E and K), phospholipids and others.

In spite of the fact that lipids are viewed as primary plant metabolites, ongoing investigations uncovered pharmacological activities to members from this class of phytochemicals. Secondary plant metabolites exert their action on molecular targets that differ from one case to the other. These targets might be enzymes, mediators, transcription factors or even nucleic acids. The utilization of herbal medicines ought to be based on comprehensive phytochemical studies for the determination of the chemical constituents of the herbs involved.