Research & Reviews: Journal of Chemistry e-ISSN: 2319-9849

A Brief Note on Phytochemicals and its Importance

Meiai Chen*

Department of Chemistry, University of Duke, Durham, United States

Perspective

Received: 06-Apr-2022, Manuscript No. JCHEM- 22-62036; **Editor assigned:** 08- Apr-2022, PreQC No. JCHEM - 22-62036 (PQ); **Reviewed:** 22- Apr -2022, QC No. JCHEM - 22-62036, **Revised:** 28- Apr-2022, Manuscript No. JCHEM - 22-62036 (R); **Published:** 06-May-2022, DOI: 10.4172/ 2320-0189.11.4.003

***For Correspondence:**
Meiai Chen, Department of Chemistry, University of Duke, Durham, United States
E-mail: Meiai Chen @edu.com

ABOUT THE STUDY

The study of phytochemicals, or plant-derived substances, is known as photochemistry. Phytochemists work to understand the structures of the many secondary metabolites found in plants, as well as their activities in human and plant life and how they are synthesised. Plants produce phytochemicals for a variety of reasons, including defence against insect assaults and illness. Plants produce a wide range of chemicals, but the majority may be divided into four biosynthetic classes: alkaloids, phenylpropanoids, polyketides, and terpenoids. Phytochemistry is a branch of botany or chemistry that studies the chemical reactions of plants. Ethnobotany can be used to lead activities in botanical gardens or in the wild. Phytochemical research aimed at human use (i.e. drug discovery) may fall under the pharmacognosy field, whereas phytochemical studies aimed at the ecological functions and evolution of phytochemicals are likely to fall under the chemical ecology study. Plant physiology and phytochemistry are both related fields.

Phytochemicals like Alkaloids, Glycosides, Polyphenols, Terpenes extraction, isolation, and structural elucidation (MS, 1D, and 2D NMR) of natural products, as well as other chromatography techniques, are extensively utilised in the field of phytochemistry (MPLC, HPLC, and LC-MS).

To protect themselves from herbivores, many plants create chemical substances. The principal classes of pharmacologically active phytochemicals, as well as examples of therapeutic plants that contain them, are described below. Weeds that contain phytochemicals, such as nettle, dandelion, and chickweed, are frequently found surrounding human populations. Curcumin, epigallocatechin gallate, genistein, and resveratrol are examples of pan-assay interference substances that aren't effective in drug development.

Alkaloids are bitter-tasting compounds that are found throughout nature and are frequently harmful. As medications, there are a variety of classes with various mechanisms of action, both recreational and pharmacological. Traditional medicines include berberine (from plants such as *Berberis* and *Mahonia*), caffeine (Coffea), cocaine (Coca), ephedrine (Ephedra), morphine (opium poppy), nicotine (tobacco), reserpine (*Rauvolfia serpentina*), quinidine and quinine (*Cinchona*), vincamine (*Vinca minor*), and vincristine (*Vinca minor*) (*Catharanthus roseus*).

Senna, rhubarb, and Aloe all contain anthraquinone glycosides. Phytochemicals found in plants such as foxglove and lily of the valley makes up the cardiac glycosides. The diuretics digoxin and digitoxin are among them. Polyphenols of various types, such as anthocyanins, phytoestrogens, and tannins, are abundant in plants.

Terpenes and terpenoids come in a variety of forms in resinous plants like conifers. They have a strong odour and are used to repel herbivores. Their smell makes essential oils helpful in perfumes like rose and lavender, as well as aromatherapy. Some have medical properties, such as thymol, which is an antibacterial and was historically used as a vermifuge (anti-worm medicine).

The same enzymes that metabolise food and medications also metabolise phytochemicals. Cytochrome P450 (CYP450) is a family of enzymes capable of increasing xenobiotic excretion *via* hydroxylation processes involving a heme molecule as a cofactor, first described and discovered by Julius Axelrod in the 1950s. Phytochemicals interact with CYP450 as metabolizable compounds, and some phytochemicals can also induce and/or inhibit individual or multiple CYP enzymes. Naturally, the number of specific CYP enzymes varies by race and by person. As a result, the effectiveness of drugs for various patients and the interactions between prescriptions fluctuate from person to person. Because activation or inhibition of enzymes might result in a lower or increased dose of the phytochemical or western drug, ingestion of phytochemicals from TCMs should be utilised with caution, especially when patients are also taking western treatments. For drugs or phytochemicals with a narrow therapeutic index or high toxicity profiles, such as warfarin or ginkgo nuts, adverse consequences are especially concerning. As the use of herbal compounds grows in popularity, especially in the United States, prescribers must be mindful of the potential for cytochrome interactions caused by common herbal extracts.