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Review

The Interflow of Traditional Drug & Innovations as fundamental Drug Design

Sarita Prajapati[1], Mohd. Shuaib[2], Fariha Parveen[3], Nitin Kumar[4], Priyanka[5], Nazim Khan[6], Sachin Kumar Yadav[7], Triloki Prasad*[8], Aslam[9]

[1]*Associate Professor, Accurate College of Pharmacy, Greater Noida, UP. India*
[2]*Director, Kalka Institute for Research and Advanced Studies, Partapur Bypass, Meerut.*
[3]*Assistant Professor, MIIT College of Pharmacy, Ghat Road, Meerut, UP.*
[4]*Assistant Professor, College of Pharmacy, Shri Venkateshwara University, Gajraula, Amroha Department-Pharmacognosy.*
[5]*Associate Professor, Kalka Institute for Research and Advanced Studies, Partapur bypass, Meerut.*
[6]*Assistant Professor, SK college of Pharmacy, Shajahanpur (Uttar Pradesh)*
[7]*Assistant Professor, Sunder Deep Pharmacy college, Dasna, Ghaziabad*
[8,9]*Assistant Professor, Kalka Institute for Research and Advanced Studies, Partapur bypass, Meerut.*

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Corresponding Author: Triloki Prasad
Email: farihaparveen833@gmail.com
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Abstract:
Traditional medicines form the integral part of the health care system for the developing countries serving around 80% of the world population and are widely used as over the counter medication. There is urgent need to classify the traditional medicines to research facilitate utilization data, safety and efficacy data, quality control measures and provide new avenues for further drug research. Medical texts of Ayurveda have classified the herbs as per their therapeutic indication, but these texts are in Sanskrit or in regional language. This makes it difficult for researchers all over world to access, understand and interpret information. Thus this innovative approach of classification can serve as one stop source of all recent updated information on the herbal drug research for the academia and industry both. Phytochemicals have a long and successful history in drug discovery.
Keywords: Phytochemicals, natural products, traditional medicine

Introduction:

Many diseases are brought on by modern lifestyle. In most cases, allopathic treatments for the disease are effective, but in some cases, they can have severe side effects. Face swelling, body rashes, itching, headache, inflammation, and drug resistance are all common side effects of allopathic medications. Herbal or plant-derived medicines, which have been used to treat diseases for thousands of years, offer a safer alternative. The best examples of the early use of medicinal plants are China and India. Numerous medicines derived from plants are used in both countries. The variety of medicinal plants depends on many things, like the climate, altitude, seasonal changes, and so on. While some plants are perennial and continue to provide a consistent source of medicinal compounds over a long period of time, others are seasonal, annual, or biennial. Natural plant products known as phytochemicals have numerous therapeutic properties. The beneficial properties of these compounds, which have been utilized in traditional medicines for centuries, highlight their potential as novel drug candidates [1]. Modern scientific methods like structural and computational biology make it possible to study these natural products more in depth in ways that have never been done before. Although some progress has been made, the research has primarily focused on a limited number and types of phytochemicals in epidemiological studies. Analysis carried out using structural biology techniques has revealed three-dimensional structures of phytochemicals [2]. Food composition databases, which contain crucial information about these metabolites that is required to test hypotheses regarding the health benefits of particular plant metabolites in the human population, are the source of this lack of data. Generally, plant-based foods that are rich in phytochemicals include whole grains, vegetables and fruits, nuts, and legumes.

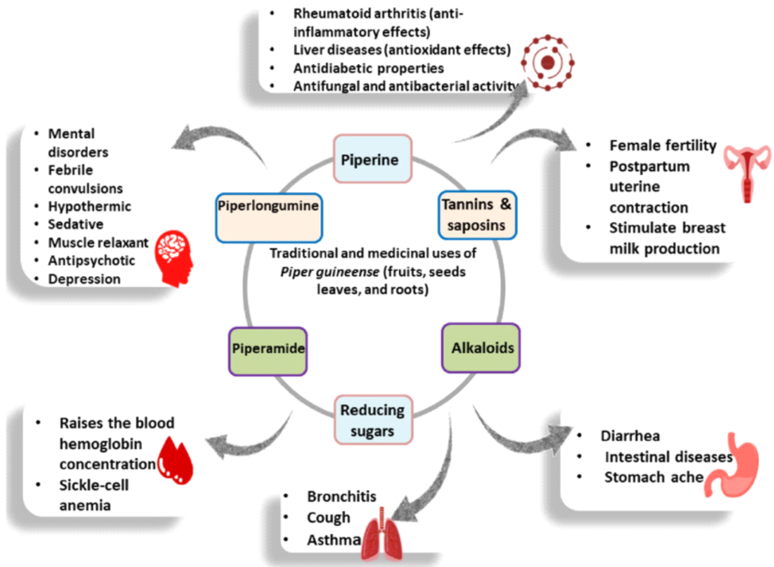

Figure:1 potential role of plant medicine in diversify ways.

The Role of Phytochemicals in Traditional Medicine

Indigenous knowledge systems are incorporated into traditional medicine, which is heavily influenced by phytochemicals derived from plants with cultural and historical significance [3]. Modern pharmacology has been shaped by the discovery of useful therapeutic agents in plant-based remedies. Ethnopharmacology, with its multidisciplinary approach, seeks to comprehend how these particular phytochemicals function in traditional healing methods [1]. Traditional medicines are used to treat diseases by about 70% to 80% of the world's population [4]. Traditional medications continue to be an essential component of inclusive healthcare solutions for people who live in rural areas all over the world and have limited access to cutting-edge Western medical practices and technology [5]. The natural resources that surround phytomedicines are derived from centuries-old healing practices. In addition, phytomedicines are advantageous among community members who value holistic recovery [6] because they maintain a patient's overall psychological and ethical balance as integral determinants of health and emphasize curing disease beyond the physical symptoms alone. Some of these preparations can be altered through structural transformation, while others are extracted directly from plants. There are a lot of unidentified phytochemicals whose biological functions have not yet been discovered due to the global natural diversity of plants [7].

Carotenoids

Carotenoids are pigments with vivid hues of yellow, red, and orange that are found in algae, plants, and photosynthetic bacteria. Fruits are explicitly rich in carotenoids, whereas vegetables such as sweet potato, carrot, pumpkin, and spinach also possess carotenoids in profuse amounts . They are abundant in carrots (*Daucus carota* L.), tomatoes (*Solanum lycopersicum* L.), orange (*Citrus sinensis* L.), daikon radish (*Raphanus sativus* L.), cabbage (*Brassica oleracea* L.), spinach (*Spinacia oleracea* L.), fenugreek (*Trigonella foenum-graecum* L.), round purple turn -carotene, -cryptoxanthin, lutein, zeaxanthin, lycopene, and fucoxanthin are the most common carotenoids [10].

-carotene is the most common carotenoid in most fruits and vegetables; -cryptoxanthin is a major carotenoid in tangerines, persimmons, and oranges; lutein and zeaxanthin are mostly found Among these, lutein, lycopene, and fucoxanthin are potent antioxidants, while -carotene, -carotene, and -cryptoxanthin are the precursors of Vitamin A. Additionally, vision is greatly influenced by lutein. Fine-feature vision is caused by zeaxanthin, an antioxidant and fat-soluble pigment that is concentrated in the macula of the retina [15]. The regulation of gene transcription by lutein, -carotene, and -carotene [7], the enhancement of gap junction communication by -carotene [4], the enhancement of immunity by -carotene and lutein [6], and the protection against lung and prostate cancer by -carotene, -carotene, lycopene, and zeaxanthin [3,5] are some of the additional health benefits of carotenoids It has been reported that fucoxanthin has anti-obesity, anti-hypertension, anti-inflammatory, radioprotective, and anti-cancer properties [16].

Polyphenols

Natural compounds that have phenolic structures fall under the category of polyphenols. There are four major subclasses within this family, including lignans, stilbenes, phenolic acids, and flavonoids. Anthocyanidins, flavanones, flavones, and flavonoids are additional subcategories of flavonoids. The artichoke (*Cynara cardunculus var. scolymus* L.), the spinach (*Spinacia oleracea* L.), the broccoli (Brassica oleracea var. italica L.), the chicory (Cichorium intybus L.), the flax (Linum usitatissimum L.), the onion (Allium cepa L.), the apple (Malus domestica L. Cherry (Prunus avium L.), pear (Pyrus L.), grape (Vitis vinifera L.), and Prunus L. Polyphenols are thought to be found in beverages like tea, red wine, and olive oil [17]. Nearly 350 aglycones and 100 glycosylate forms make up flavanones, which have a flavan nucleus made of two aromatic rings connected by a dihydropyrone ring [18]. Flavones are a large group of flavonoids that are distinguished by the attachment of the B ring to C-2 and the presence of a double bond between C-2 and C-3 [19]. Flavonols, in contrast to flavanones, have a third position hydroxyl group and a double bond between C-2 and C-3. The majority of anthocyanidins can be found in nature as their sugar-conjugated derivatives called anthocyanins. These anthocyanins are what give fruit and flower tissues their red, blue, and purple hues. Polyphenols benefit health by fighting free radicals, protecting against cardiovascular diseases, cancer, and other age-related diseases, and preventing allergies and inflammation [23,25].

Isoprenoids

Isoprenoids, which include terpenes, sesquiterpenes, limonoids, ubiquinone, camphor, menthol, and sesquiterpenes, are a group of natural compounds. They are organic compounds made up of two or more hydrocarbons that are arranged in a particular way. These are found in poplar (*Populus alba* L.), oaks (*Quercus suber* L.), eucalyptus (*Eucalyptus* L, juniper (*Juniperus communis* L.), lime (*Citrus latifolia* L.), orange (*Citrus sinensis* L.), and cannabis (Cannabis sativa L.) Isoprenoids found in plants include limonene, myrcene, and pinene. The most prevalent monoterpene found in aromatic plants and fruits, limonene imparts a flavor and aroma resembling that of a lemon.

Myrcene is an acyclic monoterpene compound that is a natural hydrocarbon made from alkenes. The active sedative principle of hops and lemongrass is another name for it. Isoprenoids are effective in Alzheimer's disease, promote sleep time, and aid in pain relief [26-27]. They also support digestion, have potential as antioxidants, and are useful in reducing appetite, stress, and anxiety.

Phytosterols

Phytosterols are a class of plant sterols and stanols that regulate the physiological processes of plants. They are rich in olive oil, as well as the oils of peanuts (Arachis hypogaea L.), almonds (Prunus dulcis L.), macadamias (Macadamia tetraphylla L.), sunflowers (Helianthus annuus L.), maize (Zea mays L.) and sesame (Sesamum indicum L.). Plant sterols include campesterol, sitosterol, and stigmasterol, whereas plant stanols include campestanol, sitostanol, and stigmastanol. With the exception of the five to six double bonds in the B-ring, campesterol is the most basic sterol due to its saturated bonds throughout the sterol structure and its hydroxyl group at position C-3 of the steroid skeleton. A methyl group is present at C24. Position 3 has a beta-hydroxyl group.C-3 position. It also improves urinary flow rate and has anti-inflammatory and anti-androgenic properties. Campestanol is a 3-beta-sterol that is a hydride that is derived from 5-alpha-campestane.

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Conclusion:

As sources of therapeutic agents and models for the design, semi-synthesis, and synthesis of various drugs for treating ailments in humans and animals, natural compounds derived from plants have long been and will continue to be extremely important. There are more opportunities to investigate the therapeutic and other biological aspects of previously unexplored natural items as a result of the increased interest in the development of herbal medicines with few side effects. Plant phytochemicals are optimized in the development and discovery of plant-derived drugs in order to produce analogs with sufficient safety and efficacy. Plant phytochemicals are optimised in the development and discovery of plant-derived drugs in order to produce analogues with sufficient safety and efficacy. Natural compounds derived from plants have long been and will continue to be very important as sources of therapeutic agents and models for the design, semi-synthesis, and synthesis of various drugs for treating ailments in humans and animals. The increased interest in the development of herbal medicines with few side effects has led to more opportunities to investigate the therapeutic and other biological aspects of previously unexplored natural items.

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