

Importance of Medical Plants and Herbs

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Annotation: The use of medicinal plants has been done since ancient times and may be considered the origin of modern medicine. Compounds of plant origin have been and still are an important source of compounds for drugs. In this study a bibliometric study of all the works indexed in the Scopus database until 2019 has been carried out analyzing more than 100,000 publications. On the one hand, the main countries, institutions and authors researching this topic have been identified, as well as their evolution over time. On the other hand, the links between the authors, the countries and topics under research have been analyzed through the detection of communities. The last periods, from 2009 to 2014 and from 2015 to 2019, have been examined in terms of research topics. It has been observed that the areas of study or clusters have been reduced, those of the last period being those engaged in unclassified drugs, traditional medicine, cancer in vivo study, antidiabetic activity, and animal anti-inflammatory activity. In summary, it has been observed that the trends in global research are more on search for new medicines or active compounds rather than

on the cultivation or domestication of plant species with this demonstrated potential.

Keywords: Medicinal plants, drugs, world wide research, bibliometrics, traditional medicine.

INTRODUCTION

Currently, numerous studies are warning of the dangers posed by pathogenic microorganisms that have developed resistance to existing antimicrobials. Scientific research has now confirmed data on the antimicrobial activity of many plants. Consequently, further studies are essential to detail the chemical composition of these plants, their antimicrobial properties, and the mechanisms behind microbial growth inhibition—both independently and in combination with conventional antimicrobials.

It is impossible to imagine the survival of the human race without plants. Our dependence on them dates back to the very beginning of human history, with medicinal plants serving as a fundamental source of medicine. Solid evidence supports the use of herbs for treating diseases and restoring health in ancient medical systems such as Ayurveda, Unani, and Chinese Traditional Medicine. The primary goal of using herbs has always been to achieve a positive interaction with the body's chemistry.

The term "medicinal plant" encompasses a wide variety of plants used in herbalism (or "herbal medicine"), which refers to the use of plants for medicinal purposes and the study of such uses. The word "herb" is derived from the Latin word "herba" and the old French word "herbe." Today, "herb" refers to any part of a plant—including fruit, seed, stem, bark, flower, leaf, stigma, or root—as well as non-woody plants. Historically, however, the term was applied only to non-woody plants, excluding those from trees and shrubs. These medicinal plants are also used as food, flavonoids, medicine, perfumes, and in spiritual activities.

The use of plants for medicine predates recorded history, with ancient Unani manuscripts, Egyptian papyri, and Chinese writings all documenting herbal applications. Evidence indicates that Unani Hakims, Indian Vaids, and various European and Mediterranean cultures used herbs as medicine for over 4000 years. Indigenous cultures in Rome, Egypt, Iran, Africa, and America incorporated herbs into their healing rituals, while others developed structured traditional medical systems like Unani, Ayurveda, and Chinese Medicine that systematically employed herbal therapies.

Traditional systems of medicine remain widely practiced today for several reasons, including population growth, inadequate drug supply, the prohibitive cost of treatments, the side effects of synthetic drugs, and the growing resistance to current medications for infectious diseases. These factors have led to a renewed emphasis on plant-based materials as a source of medicine for a wide variety of human ailments.

Characteristics of Medicinal Plants

Medicinal plants possess several key characteristics that make them valuable for treatment, as follows:

- **Synergistic Medicine:** A single plant contains numerous compounds that can interact with each other. This interaction can be complementary, enhancing their overall therapeutic effect, or it can neutralize potential negative side effects.
- **Support for Official Medicine:** Plant-based ingredients can be used in conjunction with synthetic pharmaceutical products to achieve a more effective or desired therapeutic outcome.

- **Preventive Medicine:** Certain plant components have proven effective in preventing or reducing the risk of specific diseases. This preventive role can help lessen the burden and cost associated with using chemical remedies.

Among ancient civilizations, India has been recognized as a rich repository of medicinal plants. Indian forests are the principal source of a vast number of medicinal and aromatic plants, which are extensively collected as raw materials for the manufacture of pharmaceutical and perfumery products.

The World Health Organization (WHO) recently estimated that 80% of the global population relies on herbal medicines for some aspect of their primary health care. According to the WHO, approximately 21,000 plant species have potential medicinal uses. Available data indicates that over three-quarters of the world's population depends primarily on plants and plant extracts for their healthcare. Furthermore, more than 30% of all plant species have been used for medicinal purposes at some point.

The economic significance of medicinal plants is substantial, particularly for countries like India. It has been estimated that in developed nations like the United States, plant-derived drugs constitute as much as 25% of the total drugs, whereas in fast-developing countries like India and China, the contribution is as high as 80%. These countries provide two-thirds of the plants used in modern medicine, and their rural healthcare systems heavily depend on indigenous medicinal practices.

Treatment with medicinal plants is considered very safe due to the absence of, or minimal, side effects. This compatibility with nature is a significant advantage. A key benefit is that herbal treatments are generally suitable for all age groups and sexes. Ancient scholars believed that herbs were the primary solution for a multitude of health problems. They conducted thorough studies and experiments to accurately determine the efficacy of various medicinal herbs. Most of the remedies formulated from these studies are free from side effects, which is a major reason for the growing global popularity of herbal medicine. These plants provide a rational means for treating many internal diseases that are otherwise considered difficult to cure.

Well-known medicinal plants like Aloe Vera, Tulsi (Holy Basil), Neem, Turmeric, and Ginger can treat several common ailments and are considered home remedies in many regions. For instance, many people use Tulsi for making medicines, herbal tea, and in religious rituals. Historically, various herbs have been used worldwide as symbols of honour and luck.

With increasing recognition of the role of herbs in medicine, many people have begun cultivating plants like Tulsi in their home gardens. Medicinal plants are now considered an essential resource for treating and preventing a wide range of diseases. Each plant contains numerous active compounds that can be utilized in the medical field for drug development.

Both developed and developing countries use herbal medicine to maintain human well-being, address personal health conditions, and treat specific ailments like cough. Commonly used plants for these purposes include Echinacea, Garlic, Ginger, Ginkgo, Ginseng, among others.

Medicinal plants are considered a rich resource of ingredients for drug development, contributing to both pharmacopoeial and synthetic medicines. Beyond their pharmaceutical value, these plants have played a critical role in the development of human cultures worldwide. Furthermore, many plants are important sources of nutrition and are recommended for their therapeutic values; these include ginger, green tea, walnuts, aloe, pepper, and turmeric. Some plants and their derivatives are vital sources for active ingredients used in common products like aspirin and toothpaste.

Apart from their medicinal uses, herbs are also employed in natural dyes, pest control, food, perfume, and tea. In many countries, various medicinal plants are used to repel ants, flies, mice, and fleas from homes and offices. Nowadays, medicinal herbs are important sources for the pharmaceutical manufacturing industry.

Traditional medical practitioners effectively provide recipes for treating common ailments such as

diarrhoea, constipation, hypertension, low sperm count, dysentery, weak penile erection, piles, coated tongue, menstrual disorders, bronchial asthma, leucorrhoea, and fevers.

Over the past two decades, the use of herbal medicine has increased tremendously. However, a significant lack of research data still exists in this field. In response, the World Health Organization (WHO) has published three volumes of the *WHO Monographs on Selected Medicinal Plants* since 1999.

Table-1. Some Important Historical Observations of Medicinal Plants

Medicinal Plant / Compound	Historical Importance
Foxglove	Foxglove extract marked the beginning of modern therapeutics and was later used to treat dropsy.
Digitalis	Its active constituents, digoxin and digitoxin, are secondary metabolites derived from <i>Digitalis</i> species. These compounds are still used today to manage congestive heart failure, and the <i>Digitalis</i> plant remains the primary source for these glycosides.
Morphine	Morphine was the first natural compound isolated in pure form from the dried latex of <i>Papaver somniferum</i> . This achievement spurred scientific focus on isolating other pure compounds and determining their pharmacological properties and chemical structures.
Strychnine, Cocaine, Nicotine, Papaverine, and Quinine	These compounds represent classic examples of natural products that were isolated by humans as pure chemical entities, paving the way for modern pharmacology.

Importance of some herbs with their medicinal values

Herbs such as black pepper, cinnamon, myrrh, aloe, sandalwood, ginseng, red clover, burdock, bayberry, and safflower are used to heal wounds, sores and boils. Basil, Fennel, Chives, Cilantro, Apple Mint, Thyme, Golden Oregano, Variegated Lemon Balm, Rosemary, Variegated Sage are some important medicinal herbs and can be planted in kitchen garden. These herbs are easy to grow, look good, taste and smell amazing and many of them are magnets for bees and butterflies.

Many herbs are used as blood purifiers to alter or change a long-standing condition by eliminating the metabolic toxins. These are also known as 'blood cleansers'. Certain herbs improve the immunity of the person, thereby reducing conditions such as fever. Some herbs are also having antibiotic properties. Turmeric is useful in inhibiting the growth of germs, harmful microbes and bacteria. Turmeric is widely used as a home remedy to heal cut and wounds.

To reduce fever and the production of heat caused by the condition, certain antipyretic herbs such as Chirayta, black pepper, sandalwood and safflower are recommended by traditional Indian medicine practitioners. Sandalwood and Cinnamon are great astringents apart from being aromatic. Sandalwood is especially used in arresting the discharge of blood, mucus etc. Some herbs are used to neutralize the acid produced by the stomach. Herbs such as marshmallow root and leaf serve as antacids. The healthy gastric acid needed for proper digestion is retained by such herbs.

Indian sages were known to have remedies from plants which act against poisons from animals and snake bites. Herbs like Cardamom and Coriander are renowned for their appetizing qualities. Other aromatic herbs such as Peppermint, Cloves and Turmeric add a pleasant aroma to the food, thereby increasing the taste of the meal. Some herbs like Aloe, Sandalwood, Turmeric, Sheetraj Hindi and Khare Khasak are commonly used as antiseptics and are very high in their medicinal values.

Ginger and Cloves are used in certain cough syrups. They are known for their expectorant property, which promotes the thinning and ejection of mucus from the lungs, trachea and bronchi. Eucalyptus, Cardamom, Wild Cherry and Cloves are also expectorants.

Herbs such as Chamomile, Calamus, Ajwain, Basil, Cardamom, Chrysanthemum, Coriander, Fennel, Peppermint and Spearmint, Cinnamon, Ginger and Turmeric are helpful in promoting good blood circulation. Therefore, they are used as cardiac stimulants. Certain medicinal herbs have disinfectant property, which destroys disease-causing germs. They also inhibit the growth of pathogenic microbes that cause communicable diseases. Herbal medicine practitioners recommend calmative herbs, which provide a soothing effect to the body. They are often used as sedatives. Certain aromatic plants such as Aloe, Golden Seal, Barberry and Chirayata are used as mild tonics. The bitter taste of such plants reduces toxins in blood. They are helpful in destroying infection as well. Certain herbs are used as stimulants to increase the activity of a system or an organ, for example herbs like Cayenne (Lal Mirch), Myrrh, Camphor and Guggul. A wide variety of herbs including Giloe, Golden Seal, Aloe and Barberry are used as tonics. They can also be nutritive and rejuvenate a healthy as well as a diseased individual. Honey, Turmeric, Marshmallow and Liquorice can effectively treat a fresh cut and wound. They are termed as vulnerary herbs.

Early Modern Age

A majority of the population in the developing world struggles to raise living standards and improve healthcare delivery due to increasing poverty and population growth. According to an estimate, 70-80% of people in the developing world depend on conventional plant-based remedies, as pharmaceutical drugs are often too expensive. The so-called "Green Wave," activated by rising ecological consciousness, has led to increased interest in herbal formulations across the globe. The consumption of medicinal plants has steadily increased to meet this growing demand.

Current Modern Age

In recent years, numerous novel compounds have been isolated from marine organisms, many of which have demonstrated interesting biological activities. Current research is focused on isolating pharmacologically active compounds from natural sources, particularly for diseases where currently available modern drugs are ineffective. Herbal medicines are experiencing a significant resurgence as more people turn their attention from modern pharmaceuticals towards parallel herbal systems, also known as alternative medicine.

CONCLUSION

While our lifestyles are becoming increasingly techno-savvy, we are drifting away from nature—a force we cannot escape, as we are an integral part of it. Herbs, being natural products, are generally free from side effects, making them comparatively safer, eco-friendly, and locally available. Traditionally, a multitude of herbs have been used to treat ailments specific to different seasons, and there is a pressing need to promote these remedies to save human lives. Today, herbal products symbolize safety, standing in stark contrast to synthetic drugs, which are often regarded as unsafe for both humans and the environment. Although herbs were prized for centuries for their medicinal, flavouring, and aromatic qualities, they were temporarily overshadowed by the synthetic products of the modern age. However, this blind dependence on synthetics is now receding, and people are returning to natural solutions with hope for safety and security. It is time to promote these herbs globally. Consequently, it is imperative for open-access journals to focus on and encourage researchers and clinicians to investigate the primary active ingredients that can be extracted from medicinal plants. Furthermore, efforts should be made to clarify their role in treating modern diseases and to explore how they can be used to produce or synthesize more effective drugs.

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