International Research Journal of Natural and Applied Sciences
ISSN: (2349-4077)
Impact Factor 5.46 Volume 5, Issue 12, December 2018

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Introduction and Importance of Medicinal Plants and Herbs in Pharmacognosy

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Abstract
Medicinal plant use dates back to ancient times and may even predate modern medicine. To this day, compounds derived from plants remain an essential resource for the pharmaceutical industry. For thousands of years, people have turned to plants as a source of medicine for the treatment of a wide range of conditions. Numerous records show that plants were used in the Indian, Egyptian, Chinese, Greek, and Roman medical systems to treat a wide variety of illnesses. Studies in pharmacognosy, the study of medications obtained from natural sources like plants, often lead to the creation of brand new pharmaceuticals. In recent years, people all over the world have been engaged in the process of discovering, harvesting, and testing new medicinal plants, spices, microbes, and other forms of biological diversity. Plants contain a wide variety of bioactive substances called phytochemicals, which are extracted from various plant tissues and are mostly responsible for these compounds' biological effects. Important chemical compounds found in plants include: alkaloids, phenols, saponins, carbohydrates, terpenoids, steroids, flavonoids, and tannins, etc.

Keyword
Medicinal plants,pharmacognosy , phytochemicals, biological activities

Introduction

Several different kinds of herbs are included in the umbrella term "medicinal plant" ("herbology" or "herbal medicine"). It's the practise and study of making therapeutic use of plants. The Latin word "herba" and the old French word "herbe" are the etymological ancestors of the English word "herb." Herb has come to mean not only a non-woody plant, but also any plant part, be it fruit, seed, stem, bark, flower, leaf, stigma, or root. When first coined, the term "herb" referred

exclusively to plants that did not come from trees or shrubs. These plants have multiple uses, including those of food, flavonoid, medicine, perfume, and even spiritual practises. [1]

It is estimated that between 350,000 and nearly half a million species of vascular plants are used as medicinal plants, representing 10% of all vascular plants. Plants have been and continue to be used as medicines since ancient times [2]. In the past, people relied on the trial-and-error method to identify beneficial plants and use them to treat ailments or improve their general well-being [3]. The use of these plants has been gradually refined over the generations, and this has become known in many contexts as traditional medicine. Traditional medicine is "the totality of knowledge, skills, and practises based on the theories, beliefs, and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health, as well as the prevention, diagnosis, improvement, or treatment of physical and mental illnesses," according to the World Health Organization.

The development of pharmacopoeial, non-pharmacopoeial, and synthetic drugs all benefit from access to the ingredients found in medicinal plants. Beyond that, these plants are essential to the growth of human cultures everywhere. Further, several plants are advocated for their therapeutic benefits because of their status as a significant dietary contributor. Ginger, green tea, walnuts, aloe, pepper, turmeric, etc. are all examples of such plants. The active ingredients in common household items like aspirin and toothpaste are derived from various plants. [4]

Herbs have many other use than medicine, including natural dye, pest control, food, perfume, tea, etc. Common household pests like ants, flies, mice, and fleas can be deterred with the use of a variety of therapeutic plants and herbs in many nations. These days, pharmaceutical companies frequently turn to herbal remedies as a source of raw materials.

Importance of some herbs with their medicinal values

- You can treat cuts, scrapes, and boils using herbs including black pepper, cinnamon, myrrh, aloe, sandalwood, ginseng, red clover, burdock, bayberry, and safflower.
- Many useful medicinal herbs, such as basil, fennel, chives, cilantro, apple mint, thyme, golden oregano, variegated lemon balm, rosemary, and variegated sage, can be grown in a home garden. Many of these herbs also attract beneficial insects like bees and butterflies because of their attractive appearance, pleasant aroma, and delicious flavour. [5]
- To improve a chronic disease, for example, many people utilise herbs that act as blood purifiers to get rid of the metabolic poisons that have built up over time. They are sometimes referred to as "blood cleaners" for this reason. A person's immunity can be boosted by taking some herbs, which can help alleviate symptoms like a fever.
- Some herbs also have antibacterial effects. Inhibiting the multiplication of germs, dangerous microorganisms, and bacteria is one of turmeric's many beneficial uses. Turmeric has long been regarded as an effective home medicine for a variety of ailments, including wounds and cuts.
- Chirayta, black pepper, sandal wood, and safflower are just few of the antipyretic herbs prescribed by traditional Indian medicine practitioners to reduce fever and the body heat generation associated with the disease.
- Along with their pleasant aromas, cinnamon and sandalwood are also powerful astringents. It is well-known that sandalwood can stop the flow of blood, mucus, and other bodily fluids.
- Some herbs are used to reduce stomach acid. Roots and leaves of the marshmallow plant. Their purpose is that of antacids. Herbs like this help the stomach hold onto its healthy gastric acid, which is essential for digestion.

- The venom of many animals, including snakes, can be neutralised by certain plants, and it was commonly believed that Indian sages possessed such remedies.
- Cardamom and coriander, among other herbs, are well-known for their delicious flavour. Herbs like peppermint, cloves, and turmeric all have pleasant aromas that complement the food's flavour.
- Herbs with high medicinal value and wide application, including aloe, sandalwood, turmeric, sheetrajhindi, and kharekhasak.
- Cough syrups often include ginger and cloves to help alleviate symptoms. Their expectorant quality is well-known for its ability to help loosen mucus in the respiratory tract so that it can be coughed up more easily. Additional expectorants include eucalyptus, cardamom, wild cherry, and cloves.
- Herbs like cinnamon, ginger, and turmeric, as well as others like chamomile and calamus and ajwain, basil and cardamom and chrysanthemum and coriander and fennel and peppermint and spearmint, can all aid with blood circulation. That's why doctors prescribe them to speed up the heart rate. [6]
- The disinfecting properties included in some therapeutic herbs make them effective against disease-causing microorganisms. As a bonus, they stifle the development of the germs that spread infectious diseases.
- Calmative herbs are recommended by herbalists because of their sedative properties. Used frequently as tranquillizers.
- Aloe, Golden seal, Barberry, and Chirayata are all examples of aromatic herbs that have been traditionally employed as gentle tonics. Toxin levels in the blood are lowered due to the bitter taste of these plants. When used correctly, they can also aid in the elimination of infection.
- Herbs like cayenne pepper (Lal Mirch), myrrh (Camphor), camphor (Guggul), and guaiacum (Guggul) are used as stimulants to boost the function of a system or an organ.
- Giloe, Golden seal, Aloe, and Barberry are just some of the many herbs used as tonics. They can be restorative and revitalising for both healthy and sick people.
- A fresh cut or wound can be effectively treated with honey, turmeric, marshmallow, and liquorice. We refer to these plants as "vulnerary herbs."

Pharmocognosy of medicinal plants

In 1811, an Austrian doctor named Schmidt first used the term "pharmocognosy" to describe the study of medicinal plants. Dried, unprocessed plant, animal, or mineral parts that have been used medicinally are known as "crude drugs." The Greek words pharmakon (drug) and gnosis (knowledge) are the origins of the English word pharmacology. Research into medications found in nature, particularly plants, is known as pharmacognosy and might potentially lead to the creation of brand new pharmaceuticals. Sugar, amino acids, protein, chlorophyll, alkaloids, flavonoids, steroids, tannins, etc. are all examples of phytochemicals (the word "phyto" comes from the Greek word for plant). [7] Phytochemicals are the active substances found in plants that are regarded to have medicinal or therapeutic effects.As with other aspects of pharmacognostic research, physico-chemical analysis is taken into account as a crucial factor in the evaluation and identification of the crude drug. Before moving further with research, the quality of a herbal drug must be evaluated using macroscopic and microscopic analysis to discover adulterants and impurities. Dry yield of individual chemical constituents in various solvents can be evaluated

using extractive and solubility values. Determine unrelated matter (sand and dirt) clinging to the plant surface with ash value analysis [8]. The stability of a crude medication can be determined in part by measuring its moisture content. Standardization of crude medication can be accomplished with the help of fluorescence analysis. Under the right lighting conditions, the plant extract's various chemical constituents fluoresced in a distinctive manner. It takes the addition of a reagent for some chemicals that aren't fluorescent on their own to finally become fluorescent.

Review of Literature

Since the dawn of human civilization, the Indian Traditional System of Medicine has been an integral part of providing health care service as one of the world's oldest medical practises. Ayurveda, Yoga, Unani, Siddha, and Homoeopathy (AYUSH) are all forms of Indian traditional medicine that are acknowledged internationally (Adhikari and Paul, 2018) [9]

Various plants have long been employed as remedies in conventional medicine. There is some evidence that they work, albeit it may be lacking in certain areas (double-blind trials, for example). These plants should be classified as medicinal. Herbalists, pharmacists, and pharmacologists all use the term "crude pharmaceuticals of natural or biological origin" to refer to plants and plant components that have therapeutic effects. According to several sources (Sofowora 2008[10]; Evans 2008[11]):

Surveillance, investigating outbreaks, and immunising against diseases are the three cornerstones of preventing the spread of infectious diseases. A number of medical plants and traditional medicines derived from them have been utilised to boost the immune response to a number of disease agents (Di Pierro et al., 2012[12]; Ramakrishna et al., 2011[13]), despite the seeming lack of a function for medicinal plants in these methods.

There are two primary schools of thought that have been recommended for solving significant public health issues. When it comes to stopping the spread of disease, the whole-population approach takes the whole community into account. Conversely, the high-risk strategy seeks to isolate the people who are most vulnerable to an illness or negative consequence and treat them accordingly. Geoffrey Rose first provided a definition for them in 1985 (Rose, 1985)[14].

Natural sources, meals, supplements, crude medications, and Kampo medicines have all been reviewed for their potential chemopreventive effects by Yasukawa (2012)[15]. (traditional Japanese herbal prescriptions). He concluded in his review that developing effective methods of preventing cancer is a top priority in the field of public health. Chemoprevention refers to the practise of using drugs, both natural and synthetic, to prevent the onset of cancer and its more advanced stages. Studies on the cancer-preventing properties of non-nutrient substances included in the diet have received a lot of attention recently.

Community-based growth monitoring is the starting point for Faber and Laurie's (2011)[16] South African home garden concept, which combines gardening with nutrition education. Provitamin A-rich vegetables and fruits were found to have a beneficial influence on meeting the RDI for Vitamin A and other micronutrients. They reasoned that growing food at home is a sustainable way to reduce vitamin A and other nutrient shortages over time.

Objectives

- To investigate strategies for extracting bioactive substances from plants.
- To learn more about the medicinal properties of plants utilised by humans
- TO investigate plant life with potential medical applications
- To learn about the pharmacology of plants used for medical purposes

Research Methodology

Using a proper research approach, one may methodically address the issue at hand. As a field of study, it may be thought of as an examination of the scientific method itself. In it, we examine the typical procedures followed by a researcher to better understand his research challenge, as well as the reasoning behind these procedures. The researcher needs to be well-versed in both the research methodology and the research methodologies and techniques. The data used in this descriptive study came from a wide range of secondary resources such as books, journals, scholarly papers, government documents, and printed and online reference materials.

Result and Discussion

There were a total of 34 species of medicinal plants analysed, with the majority belonging to the shrub family (48.6%), followed by 17 species (24.3%), 13 species (18.6%) of trees, 5 species (7.1%) of climbers, and 1 species (1.4%) of epiphytes (Fig 1). [17]

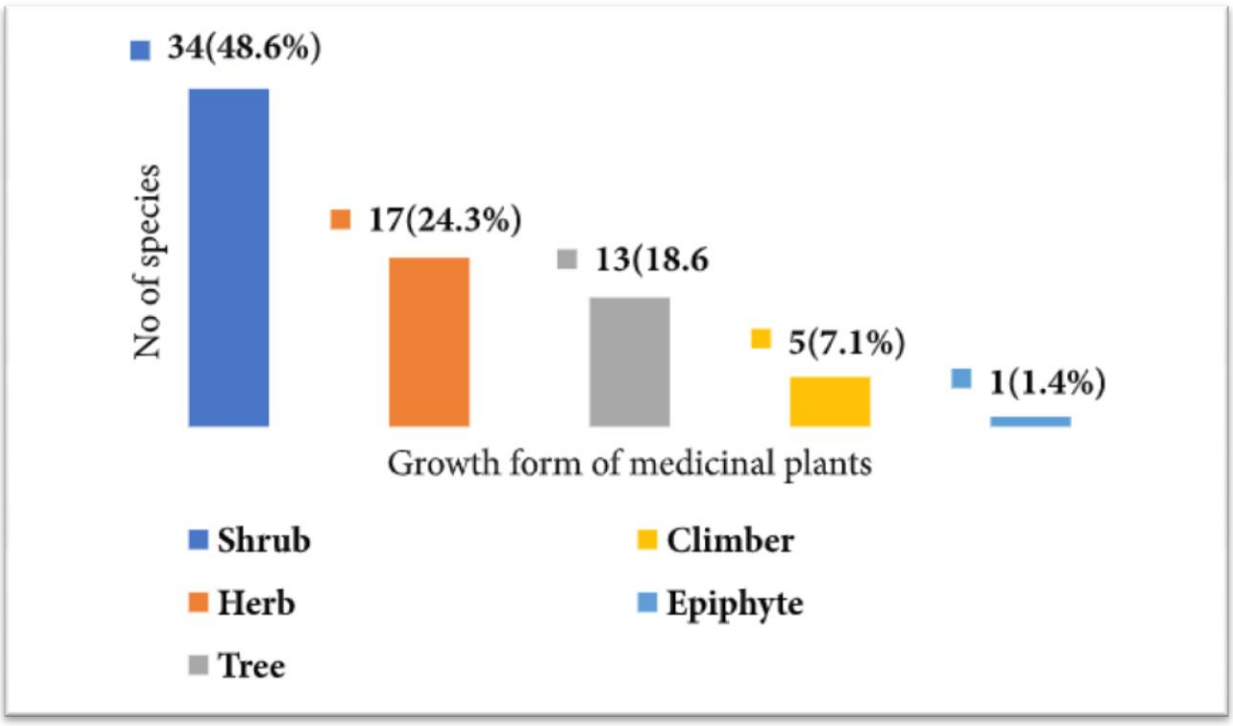

Fig. 1 The habits (growth forms) of medicinal plants used to treat human ailments in the study area

Components of several plants used in the manufacture of herbal medicines (e.g., leaves, roots, seeds, barks, and fruit). There were 43 different species collected in the research area (44.8%) for their roots (Fig 2). The reason for this is the common belief that the active chemicals in a root are more concentrated there.[18-19]

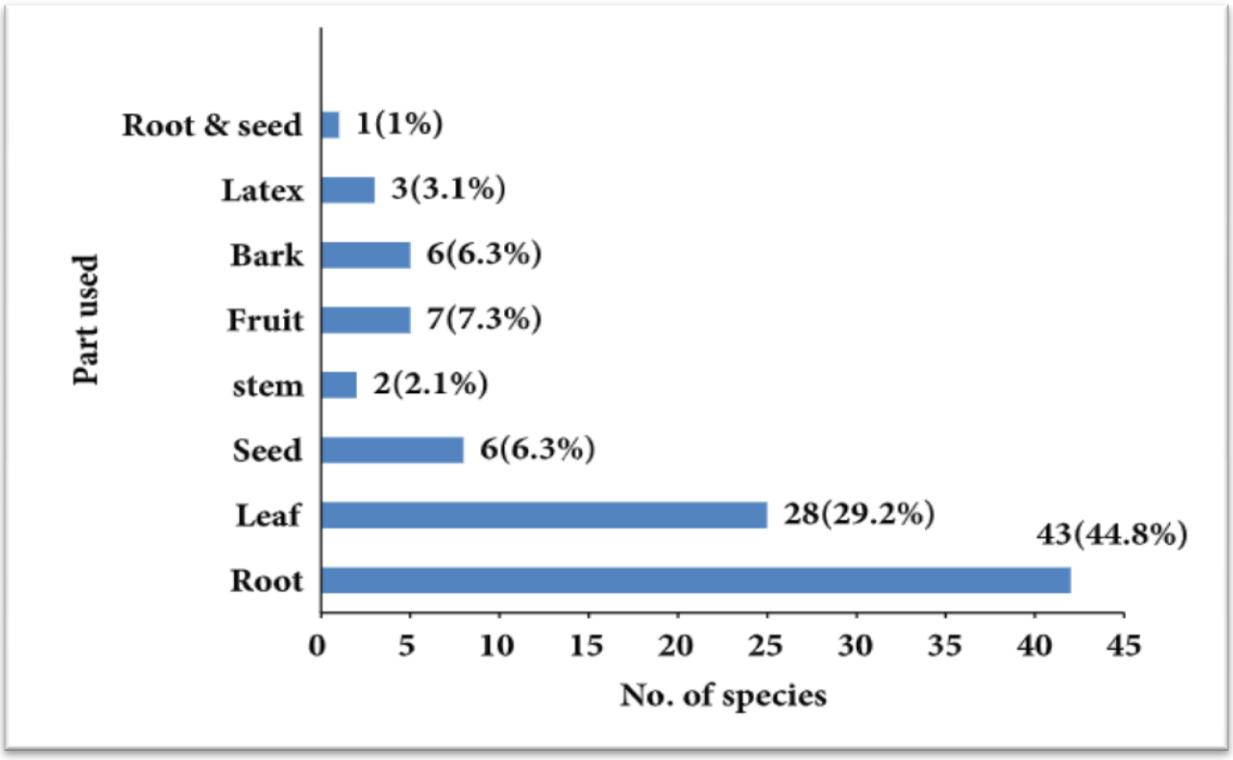

Fig. 2 Plant parts used in human traditional medicine

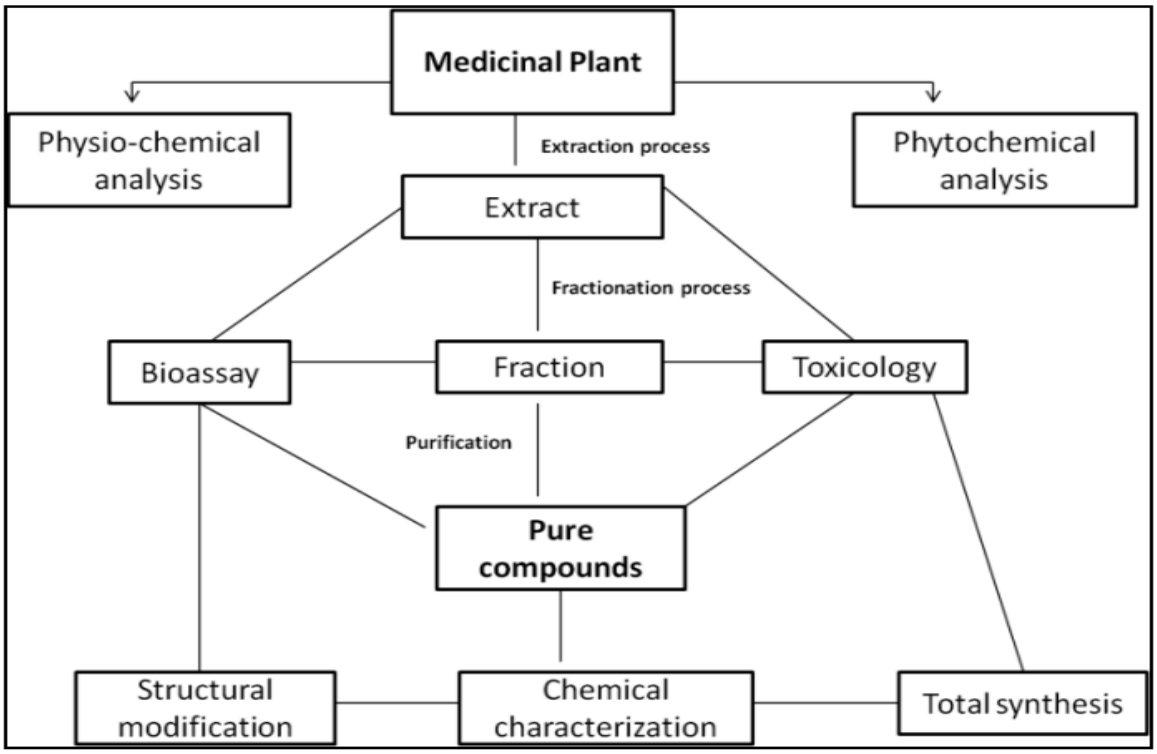

Fig. 3 Method for obtaining active biological compounds from plants

Natural resources such as medicinal plants are vital to the discovery of new therapeutics. The following procedures were depicted in Fig. 3 for the creation of a new herbal drug derived from plants. [20]

Conclusion

Plants have been used for thousands of years as the primary source of medicines. It's no secret that medicinal plants are a vital part of the global economy, as they're used in medicine and are traded all over the world. Herbal medicines have become increasingly popular in recent years due to their low cost, high effectiveness, and widespread availability [35]. Plants' healing abilities stem from their containing complex chemical components of varying compositions and biological roles. Plants' biological diversity is threatened by the rising demand for supplies of plants used as raw materials in the pharmaceutical industries. Accordingly, improved screening techniques for natural sources like plants are needed to further research for the creation and characterisation of natural pharmaceuticals. The scientific validation and discovery of a safe and potentially effective natural medication to combat diseases are two areas where medicinal plants are frequently submitted to scrutiny. Herbal remedies are preferred because they have no known adverse effects, cause less damage to the environment, and are readily available in the area. There are many herbs traditionally used to treat seasonal illnesses. If we are serious about saving lives, we must push for their widespread adoption.

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