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EXPLORING INDIGENOUS MEDICINAL PLANTS: A REVIEW OF THEIR KEY APPLICATIONS

Nitin Saini[1], Dr. Masood Ahmed Siddiqui[2]

[1]Research Scholar [2] Professor

Department of Pharmacy

Sunrise University, Alwar, Rajasthan

ABSTRACT

Out of 17,000 plant species in India, 7,500 have been formally included in ayurvedic pharmacopoeias for more than a century. Medicinal plants are used extensively in industry for a variety of products, such as herbal teas, health foods, phytopharmaceuticals, and traditional remedies. Currently, in silico methods have been created for the virtual screening and pharmacological study of medicinal plants. It is an economical and successful method of producing novel medications, and it involves three main steps: creating pharmacophores, figuring out molecular shape similarity, and molecular docking. The World Health Organisation has also recognised the value of medicinal plants and has developed a number of policies and initiatives to promote their usage. Additionally, agroindustrial technologies promote the use of therapeutic herbs. India's environment is home to a large diversity of plant species. Seven,500 of the 17,000 types of plants are used as medicinal herbs by villages, tribal people, and ancient medical systems like Ayurveda. The review's objective is to provide an overview of current advancements in the area of medicinal plants and their principal uses.

Keywords:- Ethnobotany, Phytotherapy, Traditional Medicine, Pharmacological Properties,

INTRODUCTION

Since ancient times, medicinal plants have been used to cure many diseases, including cancer. Understanding medicinal plant toxicity helps protect humans and animals from the naturally occurring toxin. Due to its bioactive constituents including proteins, polyphenols, and vitamins, medicinal plant natural extracts are being studied more. Pharmacological research on phenolic compounds is important due to their biological effects. These chemicals' aromatic rings, which include hydroxyl groups,

affect their biological activity. The medicinal herbs studied treated several skin problems. Egyptian papyri and Sumerian clay plates of Nipper reveal medical plant usage from about 5000 years ago. After a millennium, modern methods proved the properties of several ancient herbs, and some are now in pharmacopoeia. Herbal treatments have been used to treat many diseases and suffering since ancient times. Ancient people used corpus therapeuticum—plant mixes—to heal many diseases. Indian religious texts like the Vedas provide treatments using common plants like cloves, nutmeg, and others. Bioactive compounds from plants constitute a sustainable source of leukaemia therapy agents due to their diversity and accessibility. Ayurvedic and traditional medicine employ plants' bioactive components and secondary metabolites. Many phytochemicals and metabolites in medicinal plants boost the body's defences against diseases like COVID-19. Plant species that cure cancer have been found in three South African locations. Twenty plant species from 17 families were found, with the Hypoxidaceae family having the most. Thai herbal medicine sales exceeded 2.5 billion US dollars in the mid-1990s. Japanese people prefer herbal cures over synthetic drugs.

India has a diverse plant population. Villages, indigenous groups, and old medical systems like Ayurveda employ 7,500 of 17,000 plant species as medicinal herbs. Industrial uses of medicinal plants include herbal teas, health foods, phytopharmaceuticals, and traditional remedies. The Ayurvedic system uses medicinal plants to heal sickness. Ayurveda advises researching therapeutic herbs before using them. Because even plant-based drugs may be hazardous if misused. Ayurveda says poisons may be strong remedies when treated properly. The Ayurvedic pharmacopoeia has comprised 1500 of India's 10,000 plants for over a millennium. Medical plants are likewise valued by the WHO, which has promoted their use via policies and programmes. Agroindustrial technology also promote medicinal plants. The use of medicinal plants in medication research has increased due to health promotion, disease prevention, the lack of significant sickness treatments, the side effects of allopathic medicine, and other difficulties.Sleeplessness, tiredness, increased blood sugar, seizures, anaemia, coma, and occasional death are moderate to severe medication adverse effects. Due to the availability of natural sources for pharmacological use, medicinal plant research has grown worldwide. Therapeutic plant screening and pharmacological investigation are now possible in silico. It is a

cost-effective and effective strategy for developing new drugs by constructing pharmacophores, identifying molecular similarities, and docking. Research found several medicinal plants that may cure various cancers. according to several records Cancer may be treated using Asteracease, Fabaceae, Euphorbiaceae, and Rubiaceae plants. Cancer is the second biggest cause of death in the US and globally. Both genders had 34.2% and 31.7% breast and prostate cancer mortality in Nigeria. Since cancer mortality are growing, especially in underdeveloped countries with inadequate means for early detection and treatment, many rely on cheap herbal medicine. A study found 48 Kebbi state medicinal plants used by traditional healers to treat cancer. Many pharmacological investigations showed that these botanicals had comparable benefits. Leukaemia, caused by aberrant white blood cell division, is a common malignancy. Most acute lymphoblastic leukaemia cases occur in children aged 2–5. Leukaemia treatment includes chemotherapy, radiotherapy, and hematopoietic stem cell transplantation. Combining chemotherapeutic drugs lowers patient survival. These drugs' adverse effects may kill patients from cardiac and neurological issues. Overuse of these drugs has caused leukaemia cell treatment resistance. To prevent adverse effects and fatalities, new drugs with higher potencies and lower toxicity must be developed.The current situation shows that COVID-19, created by the SARS-CoV-2 virus or coronavirus, is a major threat to humanity. Coronavirus strains from bats and birds may infect other creatures. They are diverse single-stranded RNA viruses. It was first mentioned in 1960. There have been complaints of fever, cough, cold, and breathing problems. WHO: 80% of people utilise plants for health due to their medicinal qualities. Therapeutic research against viruses began in 1963 with the licencing of idoxuridine, an anti-herpes antiviral that prevents viral DNA synthesis. Some medicinal herbs, such Dioscorea batatas, Mollugo cerviana, Polygonum multiflorum Thunb, and others, can fight SARS-CoV-2. Medical herb extracts like Tinospora cordifolia are indicated for SARS-CoV-2 patients. Since synthetic drugs don't work for Covid-19, natural remedies are becoming more popular. A few patients were tried with Chinese plant extracts for symptom palliation and found positive results. Plant-based antivirals suppress antiviral and anti-dengue traits. Iranians have used medicinal plants as liver tonics. Medicinal plant sources are employed to make skin care products instead of synthetic ones. Here are some important native medicinal plants and their principal applications.

Azadirachta indica

Over time, “Neem” came from Sanskrit word Nimba. Neem a southern Asian and African tree, has been used medicinally for centuries. Azadirachta indica tree parts may treat cancer, diabetes, hypertension, etc.. Neem leaves include proteins, carbs, vitamin C, carotene, etc. Azadirachta indica leaves contain nimbosterol and quercetin, bark contains nimbidin, and flowers contain kaempferol. Neem extracts treat dermatophytosis, atopic dermatitis, and scabies. Neem has been utilised in Ayurveda to treat several diseases. It is used to make blood purification mixture and treat diabetes. Neem's bioactive components are antiviral, preventing infection. Since neem chemicals interact with the cell surface, they inhibit viral infection.

Ocimum tenuiflorum

Tulsi is a Lamiaceae plant. The primary varieties growing in India are green-leafed Lakshmi and purple-leafed Krishna. Oil from O. tenuiflorum seeds is therapeutic. [24] Local ayurveda medicine uses leaves, seeds, and roots. Many say different portions of O. tenuiflorum are utilised for anti-inflammatory, antifertility, anti-bacterial, etc. Bioactive chemicals include methyl eugenol, ßcaryophyllene, (E)-caryophyllene, ß-elemene, methyl chavicol, and linalool. Tulsi treats heart and blood vascular problems. Lowering blood lipids improves ischemia, hypertension, and cardiac strokes. Tulsi chemicals prevent insect bites and stings. Tulsi oil fights arthritis. Compared to other products, Tulsi ethanolic extract fights calcium stone inhibition best.

Mentha

Mint is a perennial plant with spreading rhizomes that flourishes in humid conditions. Their simple, fragrant leaves are unique.Mentha species like Mentha spicata produce bioactive chemicals including menthol, menthone, isomenthone, menthyl acetate, menthofuran, limonene, and others that have antiparazitic, antibacterial, antispasmodic, anticancer, and antiviral properties. Mint compounds alleviate indigestion, scalp difficulties, ear discomfort, dangerous bites, headaches, and flatulence. Mint extracts treat foul breath and gum and palate pain. Diuretics and digestive aids like mint relax stomach muscles, making food and gas easier to pass. Mint treats dry, itchy skin and bug and animal bites. It contains antibacterial and

antifungal qualities, thus humans have used it for over 1000 years to cure fungus and microbe illnesses.

Tinospora cordifolia

The "Heart-leaved Moonseed" or "Guduchi" is Giloy or Tinospora cordifolia, one of the most significant therapeutic plants researched in traditional Indian medicine. Giloy is a Menispermaceae shrubby creeper. It treats skin, anaemia, inflammation, and other diseases biologically and therapeutically. Giloy bioactive substances boost leucocyte activity and immunological system. A research identified cordifolioside A, magnoflorine, β-ecdysone, and palmatine as the primary phytocompounds in Giloy. The immune-boosting characteristic of Giloy. Many antioxidants combat free radicals, keeping cells healthy and eliminating illnesses. Giloy purifies blood, removes toxins, and fights germs. Giloy helps cure asthma, cough, cold, and tonsils.Giloy has reduced HIV viral resistance, improving treatments and proving its efficacy [33].

Trigonella foenumgraecum

Fenugreek is a leguminous crop grown globally, mostly in India. The 45–52% dietary fibre in fenugreek may lessen the incidence of certain malignancies. 6-OGalloylhomoarbutin, Meliadanoside B, Protocatechuic aldehyde, and Cistanoside C are bioactive chemicals in fenugreek that are antioxidant, anti-inflammatory, antidiabetic, and anticancer. Fenugreek extracts kill T cell lymphoma-induced cancer cells. A study found that fenugreek extracts inhibited breast, prostate, and pancreatic cancer cell lines. Fenugreek possesses antimicrobial properties and is well studied. Polyphenolic chemicals in fenugreek seeds improve health. Polyphenolic substances are antioxidants, cancer-preventives, and anti-diabetics.

CONCLUSION

Since ancient times, humans have used herbal remedies to heal pain and sickness. Ancient people utilised corpus therapeuticum, plant mixes, to heal many ailments. Vedas, the Indian sacred scripture, recommends cures utilising common herbs like nutmeg and clove. Due to disease prevention, health promotion, limited treatment choices for severe sickness, allopathic medicine side effects, and other factors, medicinal plants are used to make drugs. A study found that fenugreek extracts inhibited breast, prostate, and pancreatic cancer cell lines. Fenugreek extracts kill T

cell lymphoma-induced cancer cells. Giloy purifies blood, removes toxins, and fights germs. Giloy helps cure asthma, cough, cold, and tonsils. Mint compounds alleviate indigestion, scalp difficulties, ear discomfort, dangerous bites, headaches, and flatulence. Mint extracts treat foul breath and gum and palate pain. Tulsi treats heart and blood vascular problems. Tulsi chemicals prevent insect bites and stings. Neem's bioactive components are antiviral, preventing infection. Neem extracts treat dermatophytosis, atopic dermatitis, and scabies. In silico methods are used to screen novel pharmacological substances and assess medicinal plant efficacy. Molecular docking, mounting pharmacophores, and identifying molecular similarity may reveal the mechanism of action of medicinal plants, reducing cost and improving process competence. Many research publications have shown excellent outcomes from clinical trials of therapeutic plant components. Thus, medicinal plants have a potential future due to their numerous components that are useful against many ailments and call for more sophisticated study and clinical trials.

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