

An Overview of Indigenous Medicinal Plants and their Uses

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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: Traditional Medicine, Pharmacological Properties

I. 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 Asteraceae, 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 nimboesterol 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, β caryophyllene, (E)-caryophyllene, β -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 antiparasitic, 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 phytochemicals 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-OGalloylhomosarbutin, Meliadoside 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.

II. 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.

REFERENCES

- [1]. Abdulhafiz F, Mohammed A, Kayat, F, Bhaskar, M, Hamzah Z, Podapati SK, Reddy LV. Xanthine Oxidase Inhibitory Activity, Chemical Composition, Antioxidant Properties and GC-MS Analysis of Keladi Candik (*Alocasia longiloba* Miq). *Molecules*. 2020;25(2658).

- [2]. Ahmad Dar R, Shahnawaz M, Qazi PH. General overview of medicinal plants: A review. *The Journal of Phytopharmacology*. 2017;6(6):349–351.
- [3]. Csepregi R, Temesfői V, Das S, Alberti Á, Tóth CA, Herczeg R, Papp N, Kőszegi T. Cytotoxic, antimicrobial, antioxidant properties and effects on cell migration of phenolic compounds of selected transylvanian medicinal plants. *Antioxidants*. 2020;9(2):1–29. Available: <https://doi.org/10.3390/antiox9020166>
- [4]. Santic Z, Pravdic N, Bevanda M, Galic K. The historical use of medicinal plants in traditional and scientific medicine. *Medicina Academia Mostariensia*. 2017; 29(1):69–74.
- [5]. Srivastava AK. Significance of medicinal plants in human life. In *Synthesis of Medicinal Agents from Plants*. Elsevier Ltd.; 2018. Available: <https://doi.org/10.1016/B978-0-08-102071-5/00001-5>
- [6]. Saedi TA, Noor S, Ismail P, Othman F. The Effects of Herbs and Fruits on Leukaemia; 2014.
- [7]. Gangal N, Nagle V, Pawar Y, Dasgupta S. AIJR Preprints Reconsidering Traditional Medicinal Plants to Combat COVID-19. *Researchgate.Net*. 2020;1–6.
- [8]. Twilley D, Rademan S, Lall N. A review on traditionally used South African medicinal plants, their secondary metabolites and their potential development into anticancer agents. *Journal of Ethnopharmacology*. 2020;113101. Available: <https://doi.org/10.1016/j.jep.2020.113101>
- [9]. Singh R. Medicinal plants: A review. *Journal of Plant Sciences*. 2015;3(1–1):50–55. Available: <https://doi.org/10.11648/j.jps.s.2015030101.18>
- [10]. Kumar S, Dobos GJ, Rampp T. The Significance of Ayurvedic Medicinal Plants. *Journal of Evidence-Based Complementary and Alternative Medicine*. 2017;22(3):494–501.
- [11]. Available: <https://doi.org/10.1177/2156587216671392>
- [12]. Jain S, Dwivedi J, Jain PK, Satpathy S, Patra A. Medicinal plants for treatment of cancer: A brief review. *Pharmacognosy Journal*. 2016;8(2):87–102. Available: <https://doi.org/10.5530/pj.2016.2.1>
- [13]. Verma DKGK, Kumar P, El-Shazly M. Unmasking the Many Faces of Giloy (*Tinospora cordifolia* L.): A Fresh Look on its Phytochemical and Medicinal Properties. *Chinese Medicine (United Kingdom)*. 2021;27(11):2571–2581. Available: <https://doi.org/10.1186/s13020-018-0190-0>
- [14]. Raimi IO, Kopaopa BG, Mugivhisa LL, Lewu B, Amoo SO, Olowoyo JO. Journal of Perspectives in Medicine. 2020;100371. Available: <https://doi.org/10.1016/j.hermed.2020.100371>
- [15]. Babangida I, Ukwuani-kwaja AN, Dahiru A, Singh D, Malami I, Shinka T, Muhammad A, Yahaya Y, Manga S, Jega S. *Acta Ecologica Sinica* Ethnobotanical study of medicinal plants used for cancer treatment in Kebbi state, North-west Nigeria; 2020. Available: <https://doi.org/10.1016/j.chnaes.2020.02.007>
- [16]. Maher T, Raus RA, Daddiouaissa D, Ahmad F, Adzhar NS, Latif ES, Abdulhafiz F, Mohammed A. Medicinal plants with anti-leukemic effects: A review. In *Molecules* 2021;26(9). Available: <https://doi.org/10.3390/molecules26092741>
- [17]. Adhikari B, Marasini BP, Rayamajhee B, Bhattarai BR, Lamichhane G, Khadayat K, Adhikari A, Khanal, S, Parajuli N. Potential roles of medicinal plants for the treatment of viral diseases focusing on COVID-19: A Review. In *Phytotherapy Research*. 2021;35(3):1298–1312. Available: <https://doi.org/10.1002/ptr.6893>
- [18]. Clercq E. De. ANTIVIRALS AND ANTIVIRAL STRATEGIES. 2(September); 2004. Available: <https://doi.org/10.1038/nrmicro975>
- [19]. Hui L, Qiao ling T, Ya Xi S, Shi bing L, Ming Y, Robinson N, Jian ping L. Can Chinese Medicine Be Used for Prevention of Corona Virus Disease 2019 (COVID19)? A Review of Historical Classics, Research Evidence and Current Prevention Programs. *Chinese Journal of Integrative Medicine*. 2020;26(4):243–250.
- [20]. Asadi-Samani M, Kafash-Farkhad N, Azimi N, Fasihi A, Alinia-Ahandani E, RafieianKopaei M. Medicinal plants with hepatoprotective activity in Iranian folk medicine. *Asian Pacific Journal of Tropical Biomedicine*. 2015;5(2):146–157. Available: [https://doi.org/10.1016/S2221-1691\(15\)30159-3](https://doi.org/10.1016/S2221-1691(15)30159-3)
- [21]. Nn A. A Review on the Extraction Methods Use in Medicinal Plants, Principle, Strength and Limitation. *Medicinal & Aromatic Plants*. 2015;04(03):3–8. <https://doi.org/10.4172/2167-0412.1000196>
- [22]. Islas, JF, Acosta E, G-buentello Z, Delgado-gallegos JL, Autónoma U, León DN, Medicina, F. De, Bioquímica, D. De, Francisco A, Madero I, Pequeño A. An overview of Neem (*Azadirachta indica*) and its

- potential impact on health. *Journal of Functional Foods*. 2020;74(September): 104171. Available:<https://doi.org/10.1016/j.jff.2020.104171>
- [23]. Sayeed, M, Mallappa A, Swamy, K, Rani U. *Natural Bio-active Compounds*. 2020;1.
- [24]. Charles F, Kaba N, Donatien G, Michael A, Bonaventure N. The Potential Pharmacological and Medicinal Properties of Neem (*Azadirachta indica* A. Juss) in the Drug Development of Phytomedicine. 2019;7(1):1–18. Available:<https://doi.org/10.9734/JOCAMR/2019/v7i130093>
- [25]. Kaur P, Bala S, Kawaljit D, Sandhu S, Kumar R, Sukhvinder S, Purewal S. Tulsi (*Ocimum tenuiflorum*) seeds : in vitro DNA damage protection, bioactive compounds and antioxidant potential. *Journal of Food Measurement and Characterization*; 2018. Available:<https://doi.org/10.1007/s11694-018-9768-6>
- [26]. Kulkarni KV, Adavirao BV. A review on : Indian traditional shrub Tulsi (*Ocimum sanctum*): The Unique Medicinal Plant. 2018;6(2):106–110.
- [27]. Joshi RK. Phytoconstituents , traditional , medicinal and bioactive uses of Tulsi (*Ocimum sanctum* Linn.): A Review. 2017;6(2):261–264.
- [28]. Sharma G, Regmi S, Lamichhane R. Tulsi : a review. *Asian Journal of Pharmacognosy*. 2021;4(1):17–23.
- [29]. Sevindik M. Pharmacological Properties of Mentha Species Traditional Medicine & Clinical Naturopathy Pharmacological Properties of Mentha Species. January 2018;2–6. Available:<https://doi.org/10.4172/2573-4555.1000259>
- [30]. Vining KJ, Hummer KE, Bassil NV, Lange BM, Houry, CK, Carver D, Bertrand B. Crop Wild Relatives as Germplasm Resource for Cultivar Improvement in Mint (*Mentha* L.). *Frontiers in Plant Science*. 2020;11(August). Available:<https://doi.org/10.3389/fpls.2020.01217>
- [31]. Murugesan, S., Kottekad, S., Crasta, I., & Sreevathsan, S. (2021). Targeting COVID19 (SARS-CoV-2) main protease through active phytochemicals of ayurvedic medicinal plants – *Emblca officinalis* (Amla), *Phyllanthus niruri* Linn. (*Bhumi Amla*) and *Tinospora cordifolia* (*Giloy*) – A molecular docking and simulation study. 136(July).
- [32]. Balkrishna A, Khandrika L, Varshney A. *Giloy Ghanvati (Tinospora cordifolia (Willd.) Hook. f. and Thomson) Reversed SARS-CoV-2 Viral Spike-Protein Induced Disease Phenotype in the Xenotransplant Model of Humanized Zebra fish*. 2021;12(April):1–14. Available:<https://doi.org/10.3389/fphar.2021.635510>
- [33]. Saxena, C, Rawat, G. *Tinospora cordifolia (Giloy) - Therapeutic Uses and Importance : A review*. *CRPS*. 2019; 09(03):42–45. Available:<https://doi.org/10.24092/CRPS.2019.090302>
- [34]. Dhull SB, Sandhu KS, Punia S, Kaur M, Chawla P, Malik A, Jol P. *International Journal of Biological Macromolecules*; 2020. Available:<https://doi.org/10.1016/j.ijbiomac.2020.05.094>
- [35]. Akbari S, Hamid N, Mohd R. *Comptes Rendus Chimie Optimization of saponins , phenolics , and antioxidants extracted from fenugreek seeds using microwave-assisted extraction and response surface methodology as an optimizing tool*. *Comptes Rendus - Chimie*, 2019;22(11– 12):714–727. Available:<https://doi.org/10.1016/j.crci.2019.07.007>
- [36]. Yaldiz G, Camlica M. Assessment of Secondary Metabolites with Different Uses of Fenugreek. In *Legumes*; 2021.