

Green Pharmacy: Unveiling the Healing Potential of Medicinal Plants

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Abstract:

In the heart of dense, lush jungles where sunlight filters through the emerald canopy, a profound connection between humans and nature unfolds like a sacred dance. Herbal medicines can contribute to creating a new era in healthcare by standardizing and assessing the health of chemical substances originating from plants, which can be used to treat human ailments in the future. Within the tribe, nature is not merely a backdrop but an esteemed teacher. Through generations, indigenous communities have cultivated an intimate knowledge of the flora and fauna around them, learning from the jungle's wisdom. Most of the naturally occurring sources whose active chemicals are used today have an ethnomedical application. As a result, many pharmaceutical companies have recently updated their approaches to natural product research to find new compounds and possible sources for medication development. Thus, the purpose of this review is to explain the practice of treating a variety of diseases with medicinal plants and knowledge of the Conservation of these nature-gifted pharmacies.

Introduction:

Since the beginning of human civilisation, medicinal herbs have been recognised as providers of life-saving medications. Throughout countless centuries and numerous generations of humans, the usage of medical substances has been passed down. Plant research benefits greatly from using ethno-botany and indigenous medicines (Banerjee et al., 2014; Bhattacharjee, 2021; Acharya et al., 2021, 2022, 2023; Mandal, 2022; Basu et al., 2022; Surendran et al., 2023). Tribal communities across the globe have, for centuries, relied on the biodiversity of their surroundings to address a myriad of health concerns (Bose, 2018; Bhowmik et al., 2022; Das et al., 2022; Darro & Khan, 2023; De & Sharma, 2023). This research seeks to explore and document the traditional knowledge surrounding medicinal plants within select tribal groups, emphasizing the holistic nature of their healing practices and the sustainable use of natural resources.

All facets of an individual's health, including clinical and non-clinical practices that reflect their particular needs, are called "ethnomedicine" (Madhu & Sarkar, 2015; Maiti et al., 2010, 2013; Erfani, 2021; Ghosh et al., 2022; Das & Sarkar et al., 2023; De et al., 2023; Dhakar & Tare, 2023). The adverse effects of synthetic and contemporary medicine have led to

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considerable growth in the use of medicinal plants in recent decades. In addition, the high expense of contemporary medicine has prompted impoverished nations to turn to traditional herbal therapy, which is less expensive, more effective, and safer (Sanyal, 2022; Saha et al., 2022; Kar et al., 2022; Tamang et al., 2023; Jyotirmayee et al., 2023).

Medicinal Uses:

Tribes often possess traditional knowledge of medicinal plants, using them to treat various ailments and injuries. Knowledge is typically passed down orally through generations, and specific individuals within the community may be designated as healers or herbalists. Tribes rely on local plants for their dietary needs, including fruits, vegetables, nuts, seeds, and roots. Traditional agricultural practices, such as shifting cultivation, showcase an intimate understanding of local ecosystems and plant life (Pyne & Santra, 2017; Raha et al., 2022).

Aloe vera has been used to treat wounds for over 5000 years by the Egyptians, Romans, and native populations of Africa, Asia, and the Americas. It is still the first choice for treating burns, ulcers, and surgical wounds. Numerous naturally occurring bioactive substances, such as simple and complex water-soluble polysaccharides, pyrocatechol, saponins, acemannan, anthraquinones, glycosides, oleic acid, and phytol, are found in *aloe vera*. *Aloe vera* leaf acetone extracts had greater antibacterial properties than alcohol and aqueous extracts (Shedoeva et al., 2019; Sarkar et al., 2016; Sarlar et al., 2017; Sarkarkar et al., 2021; 2022).

Ampelopsis japonica has been shown to contain various pharmacological properties, such as antibacterial, neuroprotective, and anticancer properties. In China, India, and other Southeast Asian nations, *Aandrographis paniculata*, popularly known as green chiretta, is used as a traditional remedy for fever, snake bites, diarrhoea, infections, wounds, and itching by the tribal communities (Chen et al., 2014; Pal et al., 2022; Pimple et al., 2023). In TCM prescriptions, dried *Angelica sinensis* root is frequently used to treat feminine ailments, inflammation, headaches, moderate anaemia, exhaustion, and hypertension. In human skin fibroblasts, extracts from *Angelica sinensis* have been demonstrated to increase cell proliferation, collagen secretion, and cell motility while also activating an antiapoptotic mechanism (Hsiao et al., 2012). *Calendula officinalis*, popularly referred to as pot marigold, is a relatively common herb that is used to treat a wide range of skin ailments, including burns, wounds, and dermatitis. *Calendula officinalis* is said to possess various pharmacological properties, such as anti-inflammatory, antioxidant, antibacterial, antiviral, antifungal, and anticancer properties. The tribal people frequently utilised Asia hold great regard for green tea, an aqueous extract derived from *Camellia sinensis* leaves, due to its purported health advantages. Experimental validation of *Camellia sinensis's* antioxidant, anti-inflammatory, antibacterial, anticarcinogenic, anti-ageing, anti-obesity, cardioprotective, and neuroprotective properties has confirmed centuries of anecdotal data (Shedoeva et al., 2019). In many nations, safflower, or *Carthamus tinctorius*, seeds are a common source of cooking oil. Numerous biological activities, such as vasodilation, immune modulation, anticoagulation and thromboprophylaxis, antioxidation, antihypoxic, antiaging, antifatigue, anti-inflammation, antihepatic fibrosis, anticancer, and analgesia, have

been linked to it by recent experiments according to Yao et al. (2016). In bronchitis, asthma, and whooping cough cases, children are given a mixture of young leaf juice of *Nyctanthes arbor-tristis* L., honey, and warmed cow milk twice a day for two weeks. Young branches and leaves are used to treat gastrointestinal disorders (Debbarma et al., 2017). Indian tribal people have a long history of using medicinal plants to treat a variety of medical conditions. Many times, their traditional understanding of medicinal plants is the result of centuries of observation and research.

Some Harbal Plants Profiles:

Neem (*Azadirachta indica*): (Sakib et al., 2023)

Traditional Uses: Used for treating skin infections, wounds, boils, and as a general antiseptic.

Active Compounds: Nimbin, nimbidin, azadirachtin.

Modern Research: Antimicrobial, anti-inflammatory, and antifungal properties; potential applications in skin care and wound healing.



Azadirachta indica (Creative Commons Attribution-Share Alike 2.0)

Tulsi (*Ocimum sanctum*): (Rao et al., 2023)

Traditional Uses: Used for respiratory infections, fever, and as a general health tonic.

Active Compounds: Eugenol, ursolic acid, rosmarinic acid.

Modern Research: Antioxidant, anti-inflammatory, and antimicrobial properties; potential use in respiratory and cardiovascular health.



Ocimum sanctum (Creative Commons Attribution-Share Alike 3.0)

Turmeric (*Curcuma longa*): (Iweala et al., 2023)

Traditional Uses: Applied topically for wound healing; used internally for anti-inflammatory purposes.

Active Compounds: Curcumin.

Modern Research: Anti-inflammatory, antioxidant, and anticancer properties; studied for its potential in treating various chronic diseases.



Curcuma longa (Creative Commons Attribution-Share Alike 4.0)

Ashwagandha (*Withania somnifera*): (Kumar & Kumar, 2019)

Traditional Uses: Used for pain management and as an adaptogen to manage stress.

Active Compounds: Withanolides.

Modern Research: Adaptogenic and anti-stress properties; studied for its potential in managing anxiety and depression and improving overall well-being.



Withania somnifera (Creative Commons Attribution-Share Alike 4.0)

Giloy (*Tinospora cordifolia*): (Devi, 2020)

Traditional Uses: Used as an antipyretic for reducing fever and for its immunomodulatory effects.

Active Compounds: Tinosporin, berberine, palmarin.

Modern Research: Immunomodulatory and anti-inflammatory properties; potential use in boosting the immune system.



Tinospora cordifolia (Creative Commons Attribution-Share Alike 4.0)

Aloe Vera (*Aloe barbadensis*): (Tiwari & Upadhaya, 2018)

Traditional Uses: Used for constipation, stomach ulcers, and indigestion.

Active Compounds: Polysaccharides, anthraquinones.

Modern Research: Wound healing, anti-inflammatory, and potential applications in skin care and gastrointestinal health.



Aloe barbadensis (Creative Commons Attribution-Share Alike4.0)

Cinchona (*Cinchona officinalis*): (Aslam et al., 2023)

Traditional Uses: Used for the treatment of malaria.

Active Compounds: Quinine.

Modern Research: Antimalarial properties; historically used in developing antimalarial drugs.



Cinchona officinalis (Creative Commons Attribution-Share Alike 3.0)

Shatavari (*Asparagus racemosus*): (Bharati & Kumar, 2019)

Traditional Uses: Used for women's health, including menstrual problems and postpartum recovery.

Active Compounds: Saponins, alkaloids.

Modern Research: Potential benefits for women's reproductive health, including hormonal balance and lactation support.



Asparagus racemosus (Creative Commons Attribution-Share Alike 4.0)

Conservation technique:

Over 50,000 plant species are utilised in pharmaceuticals and other health products, accounting for more than 10 percent of all plant species. However, there are differences in the global distribution of therapeutic plants. Due to misuse for trade and treatment, some plant families contain a higher percentage of threatened species than others and have a higher number of therapeutic plants (Chen et al., 2016). Extinct (EX), extinct in the wild (EW), critically endangered (CR), endangered (EN), vulnerable (VU), near threatened (NT), least concern (LC), and data deficient (DD) are some of the threat categories that each species is assigned according to the IUCN categorisation. Now, the status of these valuable plants is going towards extinction day by day. Some strategies for addressing the issue of eradication in order to preserve the gifted plants include raising knowledge in rural communities about cultivation, harvesting, grading, packaging, and marketing and implementing capacity-building programmes that involve on-site training (Gowthami et al., 2021). Another type of conservation is In-situ and Ex-situ conservation, which are mostly used. In-situ conservation is the method where plants are cultivated and preserved in their natural habitat. Ex-situ conservation, such as seed banks, gene banks, and cryopreservation, is mostly used. The genes, seeds, and fruits are

preserved in the artificial environment (Zegeye, 2017). Numerous species, like the California condor (*Gymnogyps californianus*), Arabian oryx (*Oryx leucoryx*), whooping crane (*Grus americana*), and black-footed ferret (*Mustela nigripes*), to mention a few, have benefited greatly from ex-situ programmes. Largely, the species that need cryopreservation for long-term preservation are those that are short-lived at the standard seed banking temperature of -20°C but can withstand significant desiccation [Pence et al., 2020]. Hoffman et al. (2010) discovered that captive breeding was a significant contributing factor to improved conservation status for 16 of the 68 vertebrate species that showed improvement in status across the time period studied. Numerous ex-situ initiatives, such as captive breeding and release plans, initiative launches, and focused research, can prevent extinction and assist in bringing populations or species closer to sustainability and recovery (McGowan et al., 2017).

Conclusion:

It has been widely accepted to believe that plants can heal since ancient times. People have utilised herbs as a traditional kind of medicine. It has been demonstrated that natural products made from medicinal plants are an abundant source of physiologically active compounds, many of which have served as the foundation for creating novel pharmaceutical compounds. Most developing nations' healthcare systems heavily rely on traditional medicine and medicinal plants. Most medicinal plants used in traditional medicine are gathered from the wild. For the benefit of human and animal health, we must promote and undertake the conservation, management, and sustainable use of medicinal plants.

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