

FOCUSING ON CONVENTIONAL INDIAN MEDICINE AS A PATH TOWARDS HERBAL MEDICINE'S INTEGRATION AND DEVELOPMENT

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Abstract:

India's codified traditional medical systems and folk medicine include a wide lexicon of herbal concoctions and medicinal plants. Due to the surge in popularity of herbal medicines and products as supplementary therapies and health management aids over the past few decades, Indian traditional medicine has the potential to be promoted abroad. Traditional Indian herbal therapies are becoming popular in developed and developing countries. Many modern medications come from Ayurveda and other traditional medicinal systems' herbs. Ayurveda and other traditional herbal therapies may heal unmet medical needs and inspire new drugs. Traditional Indian herbal medicines lack pharmaceutical uniformity, information, quality control, and strict monitoring. Many regulatory and commercial methods have been introduced lately to address these challenges. Quality control, effectiveness and safety testing, and trustworthy clinical research are needed for herbal products. Indian traditional herbal medicine must be carefully and scientifically integrated with evidence-based clinical problem treatment to enhance patient care.

Keywords: Indian herbal medicine, conventional medicine, and ayurveda

Introduction

Biodiverse India has many plant species. India has about 49,000 plant species, 5,150 of which are endemic, and 8% of the world's biodiversity on 2.4% of its landmass. 1–3 The Himalayas, Western Ghats, North-Eastern Indian highlands (Khasi and Mizo hills), and Vindhya and Satpura mountains of northern India are rich in higher plant species. Herbal medicine is important in Indian culture and medicine. ¹

Plant-based drugs, which are economically important, underpin modern medicine. ⁴ Traditional medicine and botanicals are essential to biological research and drug development. Herbal medicines and lead molecules are used in the development of new drugs. Recent research suggests that long-term intake of raw herbs or herbal products may be beneficial. ^{2,5}

Synthetic drug side effects and population increase fuel alternative medicine. The WHO acknowledged that herbal medicines cannot reach "Health For Everyone." The global market for medicinal plants, herbal remedies, health items, medicines, nutritional supplements, cosmetics, etc. is expanding, indicating that herbal treatments are widely acknowledged and believed in. This has allowed India to utilise its old herbal medicine expertise and medicinal plant collection to benefit the world and its economy. ^{2,6,7}

Indian systems of medicine

Indian medicine has various thousand-year-old beliefs and methods. A large part of Indians practice and believe in Ayurveda, Siddha, and Unani, three ancient codified Indian systems of medicine (ISMs). 8–10 Although using chemicals, minerals, and animal products to make curative agents, these systems base treatment on plants. Ayurveda uses 1,200 plant species, Siddha 900, and Unani 700 in its medicinal formulas. ¹¹

Ayurveda and other ISMs are clever blends of current clinical medicine and research that may enhance illness therapy and create new medical pathways. 12 Almost 1.5 million Indian traditional medicine practitioners employ medicinal plants for promotion, prevention, and treatment.¹³

Indian civilization began with ayurveda. It may be the oldest organized conventional medical system in operation (6000 BC). The "science of life" integrates social, mental, physical, and spiritual elements of persons.^{14,15} Ayurveda emphasizes prevention and treatment. Drugs, food, and "vihara" (exercise and a healthy lifestyle) are three main therapeutic methods.¹⁴⁻¹⁶

The Brihatrayee—Charak, Sushrut, and Vagbhat Samhitas are Ayurveda's three main texts. The Charak and Sushrut Samhita describe around 700 plants, including their taxonomy, pharmacology, and therapeutic characteristics (100–500 BC).^{12,17}

The pre-Vedic Siddha system of medicine, written in Tamil and largely practiced in Tamil Nadu, is claimed to have originated in southern India (about 3000 BC–2000 BC).

This method is attributed to 18 "Siddhas" (old Siddha medical practitioners).^{14,18}

Siddha medicine recognizes three humors: wind, pitta, and kapha (phlegm). Siddha medicine uses the pulse, urine, tongue, voice, complexion, eyes, touch (to identify dry, warm, cold, or sweating condition), and feces to diagnose.^{16,18,19}

Hippocrates and Galen founded Unani medicine. Arabs and Persians introduced Unani to India in the eleventh century. The "humoral theory," which underpins Unani, states that the body has four humors: blood, phlegm, yellow bile, and black bile. Unani diagnosis relies on pulse

measurement and urine and feces analysis.^{20,21}

Dietary therapy, "Ilaj-bi-ghiza," regimental therapy, "Ilaj-bil-tadbeer," (exercise, change of climate, massage, venesection, leaching, cupping), pharmacotherapy, "Ilaj-bi-dawa," (using herbal, mineral, and animal medications), and surgery, "Ilaj-Bil-Yad," are the main therapeutic modalities in this system.²⁰⁻²²

Indian civilisation, especially rural and indigenous/ethnic inhabitants, relies on tribal or traditional medicine. This knowledge is usually passed down verbally from ancestors. The tribal and ethnic communities of India are claimed to utilise more than 8,000 different kinds of plants as part of their health care systems. 7,23 Folk medicine in rural and ethnic India employs 25,000 powerful plant-based medications.¹³

Herbal medicine and modernity: can Indian traditional medicinal systems show the way forward? Importance of herbal medicine

Herbal medicines are unique and have persisted. Despite its potential, herbal medicine is seldom employed to treat illnesses. Some ethnic groups and rural residents actively preserve ancient plant-based healing knowledge. Herbal medicine needs revival. Yet, integrating herbal medicine into modern healthcare while ensuring safety and efficacy is difficult. 65% of Indians use traditional medicine for healthcare.

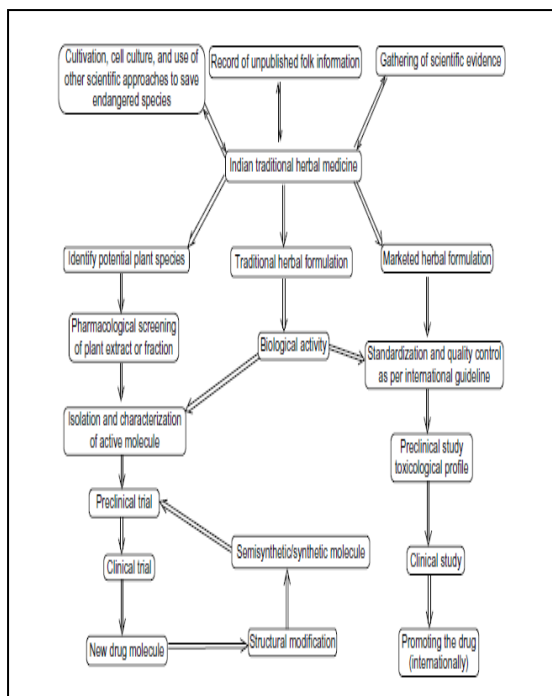


Figure-1 Strategy for advancement and integration of traditional herbal medicine into modern medicine

Due to modern healthcare's accessibility, availability, and cost, rural and isolated people utilize herbal medicines more.^{24,25} Industrialized countries increasingly use traditional medicine. Germans utilize traditional medicine 40%–50%, Americans 42%, Australians 48%, and French 49%. In the 21st century, herbal medicines and other plant-based products are becoming increasingly popular in developed countries and among those who can afford more costly allopathic treatments in hopes of establishing a more ecologically friendly, biologically friendly, and safer therapy.^{4,24,25}

20% of the 49,000 Indian plants are global species. Ayurveda utilizes 500 therapeutic herbs from over 3,500 higher and lower plant species.^{1,2} Almost 80% of medicine chemicals are natural, according to studies. Since 1994, about 50% of approved drugs incorporate natural components.²⁶

Many plants likely contain unidentified medicinal chemicals. System-biology-

based Indian traditional medicine is holistic. Diagnosis and treatment plans adapt techniques. ISMs use potent herbal combinations and a sophisticated, logical method to diagnosis based on rational observation, making them a major medical study.

Herbal products succeed due to nutritional supplementation. Herbal supplements supply nutrients not found in the diet or not absorbed well. Herbal supplements may include vitamins, minerals, macronutrients, antioxidants, and other essential components. Hence, chyawanprash, musli pak, and ashwagandhadi lehyam are in high demand.²⁷

Present scenario and future

A examination of many national pharmacopeia found at least 120 herbal-derived chemicals utilized as life-saving drugs. About 15% of the estimated 250,000–400,000 plant species have been phytochemically investigated, and only 6% have undergone rigorous biological activity screening.²⁸ Medicinal plants are estimated to make about 25% of clinical drugs, while roughly 60% of pharmaceuticals are generated from natural compounds or their derivatives. 60% of the 119 pharmaceuticals approved between 1981 and 2002 were anticancer and 75% anti-infective.²⁹ 13 natural substances were approved as medicines in 2005–2007. Approximately 100 molecules or compounds are under preclinical drug development, while over 100 natural products are in clinical trials.³⁰ Bioactive molecules from plants, especially those used in Ayurveda, include reserpine for high blood pressure, psoralens for vitiligo, alkaloids from *Holarrhena antidysenterica* (L.) against amebiasis, *Mucuna pruriens* for Parkinson's disease, piperidines as

bioavailability enhancers, vasicine and vasicinone as bronchodilators, and Modern scientific knowledge, increased clinical observation, and careful assessment enable the use of outmoded compounds for fresh therapeutic uses. Berberine alkaloids cure dyslipidemia, whereas forskolin activates adenylate cyclase. 26,31 Discovering new bioactive chemicals via systematic plant research is expensive and inefficient. Long procedures and high costs are the greatest issues. One of the most important phases in developing a novel drug is using existing Indian medical systems' understanding of medicinal plants' therapeutic efficacy. 12

Indian herbal therapy promises to treat a variety of acute and chronic ailments, their symptoms, prevent sickness, and improve quality of life. Herbal medicines include several chemicals that may operate alone or together. Ayurveda's holistic approach to treatment has helped Indian traditional medicine grow internationally. 32

Ayurveda is a scientific medical literature. Indian healthcare now includes ayurveda. USA, Sweden, UAE, UK, and Indonesia are among 30 countries close to recognizing Ayurvedic healthcare. 33

Two-thirds of Americans use alternative medicine, mostly herbal remedies. Herbal supplements and conventional therapies are popular in the US, and over 1,500 variations are available. 31 A 2007 survey found over 200,000 Americans had tried Ayurveda. 34 Ayurveda is gaining appeal as a natural alternative to modern medicine due to its systematic approach to treating and avoiding disease. 35

Support for integrative medicine grows when allopathic drugs are misused. 36 75% of the 1,000 million subcontinent residents and millions more worldwide use ayurvedic herbal medicine. 37 Herbal and

ISM plants may be utilized to make medications. Indian herbal medicine may solve unmet medical needs, offer important health care, and support medication discovery. Indian herbal medicine is reviving due to rising herbal product demand. 34

Revival of Indian traditional herbal medicine: current situation and impediments

Role of Indian organizations

Phytochemicals from ISMs, notably Ayurveda, are gaining worldwide interest, and efforts are being undertaken to integrate traditional herbal therapy with modern medicine. The Central Drug Research Institute (CDRI), Council of Scientific and Industrial Research (CSIR), Central Institute of Medicinal and Aromatic Plants, National Botanical Research Institute, Regional Research Laboratories, and National Chemical Laboratory all contribute. India has considerable research facilities. Many governments and charitable entities from several countries are actively studying Ayurvedic botanicals and cures. 28

Indian traditional medicinal plants in preclinical and clinical trial

Ayurveda and Indian medicinal plants are growing increasingly popular. 35 Clinical trials for many ISM drugs have been completed. Clinical trials employing Ayurveda medications have treated ischemic heart disease, cancer, rheumatoid arthritis, bronchial asthma, and more. Indian medicinal plants showed promise in preclinical investigations. 33,42,43

The US National Institute for Complementary and Alternative Medicine has funded several Ayurvedic research projects, including one on curcuminoids in cardiovascular Botanic: Targets and Therapy. 2015: Three plants ginger,

turmeric, and boswellia were used to cure arthritis, asthma, and Alzheimer's disease.

³⁴ *Withania somnifera* (L.) and *Asparagus racemosus* wild have significant vaccine adjuvant characteristics that suggest their usage in immunobiological formulations.

Controlled clinical investigations are necessary to assess medication effects and allopathic and natural remedies. Indian traditional treatments require clinical trials. For instance, "piperine," a bio-enhancer derived from pipali, has been successfully evaluated in clinical studies; a multicenter study found that Vijayasar (aqueous decoction of *Ptero-carpus marsupium* Roxb) was effective as a hypoglycemic and antidiabetic drug; Lupin Ltd. (Mumbai, India) filed an Investigational New Drug (IND) application; Regional Research Laboratories (Jammu) has marketed *Boswellia serrata* Roxb. gum resin as a drug; and Lupin ^{28,44-47} A double-blinded clinical trial of "arogyawardhini" an Ayurvedic remedy including amla, bahera, harar, guggulu, kutki, neem, and chitrak mool treated viral hepatitis. *M. pruriens*, *Phyllanthus amarus*, and *Tinospora cordifolia* effects have been examined. ⁴⁸ The CSIR and CDRI developed a standardized bacoside-enriched extract of brahmi (*Bacopa monnieri* L.) to boost learning and memory. Asian and European brands sell the product. The Charak and Sushruta Samhitas describe Brahmi as a brain tonic for three millennia. ⁴⁹

Challenges

Herbal medicine and Indian economy

India's economic growth depends on medicinal plant and herbal remedy sectors. Pharmacopoeias mention several important plants. The Indian Pharmacopoeia 2010 included 89 herb and herbal product monographs, whereas the Indian Herbal

Pharmacopoeia 2002, produced by the Indian Drug Manufacturers Association, has 52 monographs on popular medicinal plants in India. Ayurvedic Pharmacopoeia of India monographs included 258 medicines. ^{4,28}

AYUSH (Ayurveda, Yoga, Naturopathy, Unani, Siddha, and Homeopathy) has an estimated INR80–INR90 billion domestic market. India exports medicinal plants and derivatives valued about INR 10 billion. In 2010, India manufactured 1,650 herbal products worth over 4,000 crores. ⁴ Herbal products trade is expected to reach US\$7 trillion by 2050 from US\$120 billion. ⁸³

Notwithstanding its huge potential, India accounts just a modest share of this trade. ISMs utilize around 7,000 plant species, whereas Chinese medicine employs 500. China exports 28% of medicinal plants, whereas India exports 8.13%. India exported medicinal plants second to China in 2009. ⁴ The herbal business was valued INR7,500 crores in 2010 and is predicted to be worth INR15,000 crores by 2015. India's AYUSH exports rose 10.4% in 2012–2013. Global demand for Indian herbs and therapies is growing. Herb exports to the EU rose 11% in 2012–2013. ⁸³

Indian medicinal herbs and products include *E. officinalis* Gaertn., isabgol (psyllium husk), senna leaves and pods, henna leaves and powder, myrobalans, jojoba seed, gymnema powder, and garcenia. ^{4,86} Traditional Indian medicinal knowledge and India's large range of plants are well recognized, thus it's important to conserve this skill nationally and globally.

Future aspects and India's position

Medicine currently focuses on both treating and preventing disease. Medications currently promote health and

quality of life.⁸⁷ Hence, traditional herbal medicine must be included into healthcare. Traditional herbal medicine's integration into contemporary healthcare serves society by improving general healthcare knowledge, increasing the number and quality of practitioners, spreading primary healthcare information, and helping provide necessary healthcare to all social classes.⁷⁸

Yet, progress is accompanied by basic difficulties such fundamental variances in spirituality, fear of the detrimental effects of ancient preparations, and a decline in quality due to a lack of control and standardization.⁸⁸

Ayurveda and other natural medicines are getting more popular and require better scientific evidence.²⁸ Promoting and globalizing Indian traditional herbal therapy requires a more realistic and strong approach. The People's Republic of China has modernized its ways utilizing government-sponsored agricultural policies and good traditional medicine production practices.

Ayurveda, Siddha, and Unani medicine growth worldwide need coordinated methods. The Indian government has expanded and enhanced ISM drug testing facilities. Since 2000, India has adopted new legislation and initiated several traditional medical care activities, such as strong manufacturing standards. These initiatives have inspired optimism. Once such procedures were used, Artrex®, a poly-herbal arthritis therapy, received a US patent.²⁸

Developing ayurvedic medication advertising techniques. The Indian government's Department of AYUSH oversees ISM production, quality control, and standardization. In 2010, the

Department of AYUSH simplified licensing and exporting cosmeceuticals, nutraceuticals, and extracts from ayurveda. The Gujarat Ayurveda University, the National Institute of Ayurveda, and Integrative Medicine promote ayurveda abroad.³⁵

Ayurveda's ability to enhance basic health care for everyone led to its inclusion in the Indian national health care system.³³

This will improve access to basic medical treatments and demonstrate Ayurveda's power. Part Two of a February 2013 status report on Indian medicine and folk healing discussed the government's stance on integrating and globalizing Ayurveda and Unani medicine as adjuvant medicines and their integration into health care delivery.⁸⁹

Medical tourism attracts individuals to herbal medicine and boosts worldwide commerce in the 21st century. Globalization has people seeking better treatment choices. Japan, the US, the UK, and Europe have fast-growing elderly populations. Natural health care has grown in popularity as life expectancy rises. India can execute such programs. 1.27 million medical tourists from the UK, USA, Canada, China, Bangladesh, and Sri Lanka visit India for high-quality, risk-free traditional herbal medicine.

2.8 million medical tourists will boost the industry to US\$3.96 billion by 2015. This might yield US\$1.8 billion in foreign currency.⁹¹ Ayurveda and other Indian medicinal traditions are valued and widely accepted by this event. Such conditions acknowledge India's potential and propose that herbal medicine may be integrated into modern healthcare. Medical tourism's ability to boost India's economy supports herbal medicine usage.⁹¹

The customary Indian Materia Medica

comprises 2,000 natural remedies and their uses. 400 are from minerals and animals, 300 from plants.⁹²

The TKDL lists 291 plants used in traditional formulations and 500 Ayurveda, 500 Unani, and 200 Siddha formulations.⁷⁶ Ayurvedic medicinal herbs have great promise as nutritional supplements, nutraceuticals, prescription drugs, and over-the-counter treatments.²⁴

Indian hospitals and doctors practice Ayurveda and other ISMs. These procedures are giving the primary healthcare facility impressive results and attracting global attention.

Herbal medicine offers safer and more compatible drugs. Indian traditional medicine explains how to use medicinal herbs to heal various disorders. Indian herbs and medicinal plants may give basic and advanced medical therapy worldwide.

Conclusion

Several individuals employ Indian traditional herbal therapy with modern medicine to cure their health issues. Despite their popularity, promoting Indian traditional herbal formulations and botanicals needs scientific data, rational design, adequate standardization, and careful monitoring. Indian traditional herbal treatment needs ways to become evidence-based medicine. Hence, identifying resources and molecular processes may provide new drugs. Recent research shows the potential of Indian medicinal herbs for medication development, while many plants remain untested. The careful and methodical integration of herbal remedies from ISMs into the modern system is essential to preserve Indian interests and improve healthcare.

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