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Scientific Validation of Traditional Medicines

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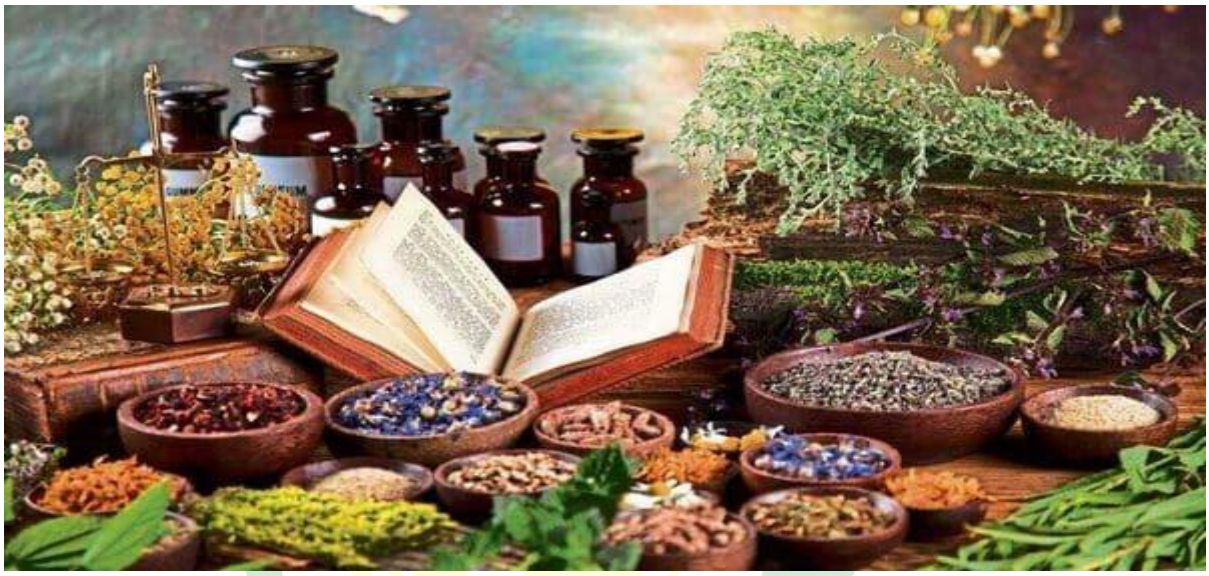

India has a rich heritage of traditional medicine and traditional healthcare systems have been flourishing for many centuries. Himalayan sage scholars who practiced traditional medicine said "Nanaushadhi bhootam jagat kinchit" *i.e.*, there is no plant in the world which does not have medicinal properties. Use of plants as a source of medicine has been an ancient practice and is an important component of the health care system in India. The Indian Materia medica includes about 2000 drugs of natural origin, almost all of which are derived from India's different traditional systems and folklore practice. The World health organisation estimates that about 80% of the population living in developing countries relies almost exclusively on a traditional medicine for their primary health care needs. In almost all traditional medicines medicinal plants play a major role and constitute the backbone of traditional medicine. Indian traditional medicine is based on various systems including Ayurveda, siddha and Unani. Each of these traditional systems of India medicine are unique but there is a common thread in their fundamental principles and practices. With the emerging worldwide interest in adopting and

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studying traditional systems and exploiting their potential based on different healthcare systems, the evaluation of the rich heritage of traditional medicine is essential.

The evaluation of these drugs is primarily based on phytochemical, pharmacological and allied approaches including various instrumental techniques such as chromatography, microscopy and others. The government and the private sector are exploring all of the possibilities for the perfect evaluation of these systems in order to effectively adopt the therapeutic approaches available in original systems of medicine as well as to help in generating data to put these products on the national health program. Traditional medicinal system suffers from lack of acceptance by modern allopathic doctors in the belief that traditional uses lack appropriate scientific basis for use. On the other hand scientific validation of traditional uses of medicinal plants can become an important means through which not only low cost medical treatment can be provided but also such treatment can be available easily to poorer segments of the population and the people living in remote areas and as such lacking accessibility to modern medicinal practices. There has been an increasing interest in medicinal plants as a natural alternative to synthetic drugs.

Traditional medicines:

According to World Health organisation traditional medicines are "The sum total of the knowledge, skills and practices based on the theories, believes and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness". Traditional medicine also known as indigenous or folk medicine comprises medical aspects of traditional knowledge that developed over generations within various societies before the era of modern medicine. Some of the traditional medicinal system supported by huge volume of literature where as other passed down from generations to generation through verbal teaching.

Types of traditional medicines:

1. **Ayurveda:** Ayurveda is considered as the ancient traditional medicine. In the Indian system of traditional medicine, it is presumed that the knowledge of Ayurveda is given by the gods of a different world. Ayurveda is accepted as the ancient written medical system and it is supposed to be more effective in certain cases than modern therapies. Ayurveda is accepted to be the oldest treatise on medicine which came into existence in about 900 BC. The word Ayurveda derived from 'Ayus' meaning life and Veda

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meaning science. Thus, Ayurveda literally means the science of life. Plant derived drugs were classified for treatment and evaluation based on their therapeutic action from ancient times. Ayurvedic treatment is aimed at the patient as an organic whole and treatment consist of salubrious use of drugs, diets and practices. Ayurvedic medicinal preparations are complex mixtures including plant and animal derived products.

2. **Siddha:** The term siddha comes from 'Siddhi' which means attainment of perfection. It is considered as the symbol of Tamil culture or Dravidian culture originated in South India. This system is almost akin to Ayurveda. It is an ancient traditional system of medicine developed by 18 siddas. The siddha system believes that everything in the universe is made up of 5 basic elements earth, water, fire and space which constitute the human body and other worldly substance. Siddha medicine consist of the psychosomatic system where attention is given to minerals and metals rather than plant constituents. 10 formulations in Siddha medicine include herbal products inorganic substances and animal products.
3. **Unani:** Unani medicine owes its origin to Greece. It was the Greek philosopher physician Hippocrates (460-377BC) who freed medicine from the realm of superstition and magic and gave it the status of science. The Unani system believes that every person has a unique humoral constitution that represents his healthy state. Any change in this state affects his health. Pharmacotherapy deals with the use of naturally occurring drugs, primarily herbal medicines.
4. **Homeopathy:** It was developed in the late 1700's in Germany and popular in USA. Homeopathy is a medical system based on the belief that the body can cure itself. A basic belief behind homeopathy is 'like cures like'. In other words, something that brings on symptoms in a healthy person can in a very small dose treat an illness with similar symptoms. This is meant to trigger the body's natural defences. Those who practice it use tiny amounts of natural substances like plants and minerals along with synthetic substance. They believe these simulate the healing process.
5. **Tibetian or Amchi medicines:** Sowa-Rigpa commonly known as Amchi system of medicine is one of the oldest, living and well documented medical traditional of the world. It has been popularly practiced in Tibet, Mongolia, Bhutan and some parts of China, Nepal, Himalayan regions of India and few parts of former Soviet Union. The

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majority of theory and practice of sowa-rigpa is similar to Ayurveda. In this system they uses the herbal medicines including minerals, animal products as well as plants.

6. **Naturopathy:** Naturopathy was founded by Dr. Lust in New York and this concept is based on healing power of nature. Naturopathic medicine is a system that uses natural remedies to help the body heal itself. It embraces many therapies including herbs, massages, acupuncture, exercise and nutritional counselling. It is a self-healing mechanism which helps to restore the vitality by using folk medicines.

Traditional medicines sometimes also known as indigenous or folk medicine which includes

- **Folk medicine**: Folk medicine are longstanding remedies passed on and practiced by lay people.
- **Complementary alternative medicines:** Therapies which are used along with the traditional Western medicines which includes ayurveda, aroma therapy, hypnosis, Homeopathy, herbal medicine, meditation, Chroma therapy, massage therapy, reiki, diet therapy, acupuncture and yoga.

Advantages of traditional medicines over allopathic medicines

- Since traditional medicinal system has been practiced in various countries from time immemorial and still persists in the modern age, the people have both found it as well as believe that the system is efficacious in curing diseases.
- It is a holistic way of treatment throughout the world as such traditional medicine aims at curing the whole body instead of specific symptoms, which is often done in allopathic medicine.
- It offers a cheaper alternative since that traditional medicinal practicing mostly uses simple decoctions of plants, animals or minerals. The medicine can be afforded by the poorer segments of the population particularly of the developing countries.
- Most of the traditional medicinal practitioners are usually found in rural areas. People have better access to them than modern medical practitioners who tend to coverage in the biggest cities and so are inaccessible to the rural population lacking road and other communication facilities.
- The close proximity of the traditional practitioners with the rural population generates in the rural people particularly women to disclose their illness to the traditional

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practitioners, such rural women may feel hesitancy to discuss their illness or symptoms with the city doctor.

- Allopathic medicine cannot provide any cure for common diseases like rheumatism or diabetes but merely treats and elevate the symptoms while traditional medicinal practitioners claim to have complete cure of these diseases in many parts of the world.
- Allopathic drugs are now increasingly associated with severe side effects and development of drug resistant vectors. All these factors have contributed to a resurgence of interest in traditional medicine.
- Easily available: Traditionally in India, plants with medicinal value were grown in home gardens. These plans were used effectively as self-help remedies for managing primary health care.
- Traditional medicines serves as an alternative approach to health care as these are safe, high in efficacy and quality.

Scientific validation:

Scientific validation is the process which provides scientific basis for the use of traditional medicines through various clinical trials. This process involves extraction of plant material which are used in traditional medicines and plant extracts are carefully observed tested through different phytochemical analysis and after analysing the results through sound publication validated for further use.

Scientific validation of traditional medicines

Even though with rich traditional background there is a hindrance to use of traditional medicines because of lack of adequate or accepted research methodology for evaluating traditional medicine. Hence there is a need of scientific validation in order to provide scientific basis and sufficient data and that on the traditional medicines and its therapeutic uses with sound scientific publication since these serves as the natural alternative to synthetic drugs.

Advantages of scientific validation

- Since this system of medicines were mainly practiced by the traditional healers and folklores scientific validation helps to supports the traditional knowledge of local users.
- It provides sufficient data on safety and efficacy of traditional medicine.
- Scientific validation also helps to fix the dosage of different medicines for different diseases

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- Avoids the unscientific use herbs
- It also builds the trust among user through proper records and scientific data.
- It ensures better quality

Modern drugs developed from traditionally known drug

Plant source	Traditional medicinal source	Modern drug
Papaver somniferum	Reduces pain, suppresses cough and sedative	Codeine
Filipendula ulmaria	Reduces pain, fever and inflamations	Aspirin
Ephendra sinica	Reduces nasal congestion	Ephindrine
Cinchona ledgeriana	Combats malaria	Quinine
Rauvolfia serpentina	Lowers blood pressure	Reserprine
Datura stramonium	Eases motion sickness	Scopalamine
Dioscorea floribunda	Contraceptive	Diosgenin
Catharanthus roseus	Opens bronchial passage	Theophyllin
Digitalis purpurea	Dropsy, relieves heart congestion	Digitoxin

Major plant drugs for which no synthetic substitute

Drug	Plant	Uses
Quinine	*Cinchona ledgeriana*	Antimalarial
Taxol	*Taxus baccata, Taxus brevifolia*	Breast and ovary cancer, anti tumour
Pristimerin	*Celastrus paniculata*	Antimalarial
Quassinoids	*Ailanthus*	Antiprotozoal
Catechin	*Acacia catechu*	Antiulcer
Sophoradin	*Sophora subprostrata*	Antiulcer
Elipticine	*Ochrosia sp.*	Anticancer

History of medicines

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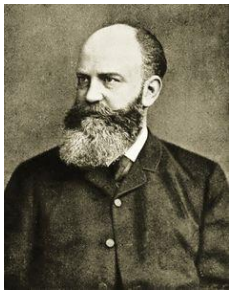
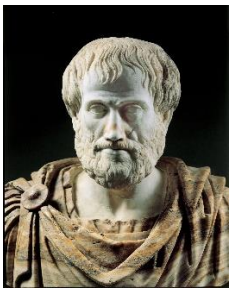
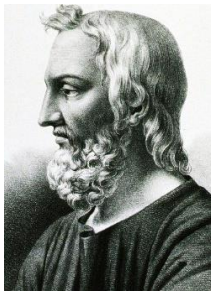




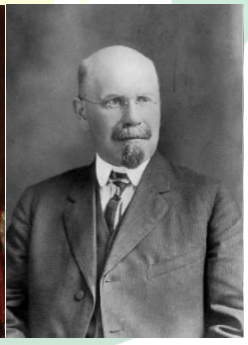


George Eber **Hippocrates** **Aristotle** **Theophrastus** **Dioscoroides**





Pliny **Rhazes** **Carl. Linnaeus** **F. W. Sertuner** **Pellatier**

J. B. Caventou **Harsh berger**

Since from ancient times, people exploring the nature particularly in search of modern drugs. Archaeological discoveries of 60,000 years old Neanderthal burial ground in Iraq point to the use of several plants like marshmallow, yarrow and groundsel that still figure in folk medicine. Ancient Egypt also gave the world one of its first medical texts, the Eber papyrus named after the German Egyptologist George Ebers. The papyrus is believed to have been written in the 16th century B.C. It contains some 800 recipes and refers to over 700 drugs. During 400 B.C. a Greek named Hippocrates moved the healing profession away from the

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releam of mysticlam and religion. His writings name some 300 to 400 healing plants. For his contribution he is called the 'Father of Modern Medicine'. After hypocrites came Aristotle whose farranging scientific work induced an effort to catalogue the properties of various medicinal herbs. Theoprastus (300 B. C), a botanist whose treatise 'Inquiry into plants' influenced both botany and medicine for centuries is called father for pharmacognosy. He describe the characters of herbs like Cassia, Mentha, Belladona, Squill and several others. In the first century A. D. Dioscoroides gave the most authority text on botanical medicine for over a thousand years. De Meteria Medica. In this book he discussed in detail about identification, collection, adulteration and therapeutic uses of several thousand plants. Pliny's Natural history published in the first century A. D stated that plants exist to meet man's needs and all plants not clearly useful for man's food and clothing. Rhazes a physician born in Persia in the late 90 century wrote a famous treatise correctly describing the smallpox and measles for the first time. Carl. Linnaeus written the book 'Species Plantaram'- in his book he gave nomenclature and taxonomic classification of about 5900 medicinal plants. Chemical investigation on plants on scientific lines started from 1800 A. D. F W Sertuner (1806), a German pharmacist who discovered morphine from opium from the plant *Papaver somniferum* and the French chemist P. J. Pellatier and J. B. Caventou (1820) discovered quinine from Cinchona bark which was universally recognised as a remedy for malaria. These inventions have laid the foundation for scientific validation. American botanist Harsh burger was the first person to introduced the word ethnobotany to the world.

History of ancient Indian medicine

According to Indian Hindu mythology there are four vedas written by the Aryans: Rigveda Samaveda, Yajurveda and Atharvaveda. Among these the Atharvaveda strictly speaks about traditional medicines and it also known as Vedas of magical formulae. Ayurveda is said to be an upaveda of Atharvaveda where the charak samhita is the first recorded treaties fully devoted to the concept of the practice of Ayurveda. It describe 341 plants and plant products for use in medicine. It is considered as the landmark of internal medicine till date.

The next landmark of the ayurvedic literature was the Sushruta samhita which emphasizes surgery. It described 395 medicinal plants, 57 drugs of animal origin and 64 minerals and metals as therapeutic agents. National policy on traditional and alternative medicines was introduced in the form of Drug and Cosmetic act in 1940 and drug and cosmetic

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rule 1945. In 1959 the Government of India recognised the traditional Indian systems of medicine and amended the Drugs and Cosmetics Act to include drugs which are derived from traditional Indian medicine. The Department of Indian System of Medicine and Homeopathy (ISM&H) was thus launched in March 1995 under the Ministry of Health and Family Welfare and the department of ISM&H was renamed as the Department of AYUSH in 2003. On 9th November 2014 first time the department of AYUSH is formed as a separate ministry known as Ministry of AYUSH. The traditional knowledge digital library (TKDL) set up in 2001 collaboration between the council of scientific and industrial research and ministry of Ayush to protect the ancient and traditional knowledge.

Scope and importance:

- Traditional medicine (TM) is one of the primary sources of healthcare to village and folk people. 80% of population uses herbal medicines for some aspects of primary health care.
- Nearly 75% plant based therapeutic entities used worldwide were derived from traditional medicines and this medicine acts as a vital source of new drugs.
- Folk healers of India uses more than 7500 medicinal plants in different medicines.
- Ministry of environment and forest have identified and documented over 9500 plants species considering their importance in the pharmaceutical. Over 7000 different species of plants found in different ecosystems are said to be used for medicinal purposes in our country. Rajasthan is having highest area under these crops with the share of 56%.

Present status of traditional medicines in India

- In India about 70% of rural population depends on the traditional medicines for healthcare.
- Modern medicines utilise around 75% of the folk formulations.
- India is the largest producer of medicinal plants. There are currently about 2,50,000 registered medical practitioners of the Ayurvedic system as compared to about 700,000 of the modern medicines.
- Ministry of Ayush: India's domestic herbal industry is represented by 8610 licence herbal units, around 25,000 effective plant-based formulations of traditional and folk medicines, thousands of cottage level unregulated herbal units and millions of folk healers and household level users of thousands of herbal raw drugs on one hand and a

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complex trade web on the other that channels the herbal raw drugs from various supply sources to the end users. In an event conducted in New Delhi recently, it was announced that India is the second largest exporter of medicinal plants in the world. With 6,600 medicinal plants, India is second to China in this ranking and together they produce over 70% of the herbal medicines demand over the globe. The event also witnessed a discussion revolving around various topics such as Ayurveda, yoga, and naturopathy, Unani, siddha and homeopathy.

Oriented research and development institutions in India

- Dabur research foundation- Traditional Knowledge with Modern Science
- Himalaya healthcare
- Zandu pharmaceuticals- Herbo-mineral products
- Avestha Gengraine Technologies- Food for medicine
- Reliance Life Sciences- Products of Secondary Metabolites
- Pantanjali