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Pratiksha P Rathod
Shri Swami Samarth Institute of Pharmacy, At. Parsodi Dhamangaon Railway, Amravati, Maharashtra, India

Tejas V Solanki
Department of Pharmaceutics, Shri Swami Samarth Institute of Pharmacy, At. Parsodi Dhamangaon Railway, Amravati, Maharashtra, India

Ravindra L Bakal
Department of Pharmaceutical Chemistry, Shri Swami Samarth Institute of Pharmacy, At. Parsodi Dhamangaon Railway, Amravati, Maharashtra, India

Pooja R Hatwar
Department of Pharmaceutics, Shri Swami Samarth Institute of Pharmacy, At. Parsodi Dhamangaon Railway, Amravati, Maharashtra, India

Corresponding Author:
Pratiksha P Rathod
Shri Swami Samarth Institute of Pharmacy, At. Parsodi Dhamangaon Railway, Amravati, Maharashtra, India

The evolution of Ayurveda: History and herbal remedies

Pratiksha P Rathod, Tejas V Solanki, Ravindra L Bakal and Pooja R Hatwar

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Abstract
Ayurveda, a traditional system of medicine native to India, has a rich history spanning over 5,000 years. Ayurveda has the distinction of being the “oldest medical system known to man and the oldest and most comprehensive spiritual teachings in the world”. Ayurveda is based on the principle of maintaining a balance between the interrelated relationships within the body and mind. It helps the patient to understand the benefits of knowing their body and mind and to live in intimate relationship with nature. An attempt has been made to present general information about various aspects of the system in the review article. These aspects include basic principles, diagnosis, treatment aspects, types of treatment, various aspects of Panchamahabhuta, and the relationship between Panchamahabhuta and Tridoshas.

Keywords: Ayurveda, history, traditional medicine, disease treatment

1. Introduction
Ayurveda is the most common traditional system of medicine of India [1]. Ayurvedic medicines are often considered effective for treating chronic and lifestyle-related diseases [2]. Ayurveda is an ancient medical system in India that describes many aspects of health; prevention and treatment of diseases [3]. Ayurveda, an ancient Indian system of medicine documented primarily in Sanskrit, offers comprehensive definitions, principles, and procedures for disease prevention and treatment [4]. The chronic diseases like cardiovascular diseases, diabetes and cancer contributes to almost half of all-cause mortality in India [5]. The epidemic of cardiovascular diseases (CVDs) is the most prevalent cause of death and disability in both developed as well as developing countries [6]. In a first for pre-independence India, ayurvedic treatment for tuberculosis was started, and treatment guidelines based on ayurvedic principles for therapeutic management were adopted [7]. A biological organism's metabolic efficiency is a measure of its health. It is the capacity of people or groups to adjust and control themselves in the face of social, mental, or physical difficulties [8]. Ayurveda has been criticised for primarily extending the objectives of contemporary medicine rather than employing a whole system testing technique to validate its core ideas [9]. Preparations made from different plant parts, including as leaves, flowers, roots, and other sections, are referred to as medicinal plants. Each of these parts has a unique set of medical uses [10]. An Ayurvedic diagnosis is made based on a clinical history and evaluation of physical and psychological traits [11]. Patients who experience extreme pain are more prone to experiment with complementary and alternative therapies like Ayurveda [12]. Ayurveda, which translates to "the science of life," is a comprehensive medical system that seeks to enhance wellbeing. Ayurveda upholds the idea that physiologic equilibrium must be maintained or restored in order to achieve health [13]. Because of their beneficial effects on cognitive impairment and biosafety profile, ayurvedic herbal drugs are being studied more and more [14]. Significant biological benefits, particularly those with anti-inflammatory and immunomodulatory properties, have been shown by Ayurvedic medicinal herbs [15]. A variety of medicinal herbs and herbal-based preparations have been identified and proven to be beneficial for diabetic mellitus in traditional medical systems [16]. Because they are based on plants or "natural" components and have been used for thousands of years in various cultural contexts, traditional medicines are frequently seen as "safe"[17]. Since ancient times, people have utilised plant-based medications to treat and prevent illness as well as to enhance mental health [18]. Medicinal plants are widely accessible and offer a low-cost, less harmful source for creating novel medications [19].

2. History
Medicinal plants are thoroughly documented in Ayurvedic literature. There are four different phases to the documentation era. The periods under question are the Vedic, Classical, Mediaeval, and Modern periods [20].

2.1 Vedic period (circa 4000-1500 BCE)
The ancient practice of Ayurveda originate the second century BC. The ancient schools of Hindu philosophy known as Vaisheshika and the school of logic known as Nyaya created the groundwork for Ayurveda [21].

2.2 The classical period (circa 1500 BCE-700 CE)
The sage Charaka is credited with writing the "Charaka Samhita," the basic text of Ayurveda, which is said to have been composed during this time. It encompasses several medical topics, including as anatomy, diagnosis, and therapy. The "Sushruta Samhita," which is credited to the sage Sushruta, is another significant work from this era [20].

2.3 Modern period (15th century-present)
Every prehistoric society has a set of cures for common ailments that have developed by inspiration, accident, or trial and error. However, these treatments were entirely empirical and unfounded in any rational theories of disease or medication [22].

3. Basic Principles of Ayurveda:
The ancient Indian medical system known as Ayurveda is founded on a number of core ideas and precepts that shape its conception of health, illness, and therapy. The foundation of Ayurvedic philosophy and practice is comprised on these principles. These are the fundamental tenets of Ayurvedic philosophy [20].

3.1 Panchamahabhutas
The concept of Panchamahabhuta is explained in length by Ayurveda. Every substance in the universe has a distinct panchamahabhautic makeup, regardless of whether it is a living entity or not. The concept of panchamahabhuta (five components) for Chikitsa is the foundation of Ayurveda. It acknowledges that everything in the universe is composed of five basic elements: Akash, Vayu, Agni, Jal, and Prithvi. When these five components of the human body are in balance, it indicates health; when they are out of balance, it indicates disease (Vyadhi) [23]. The Panchamahabhutas make a substantial contribution to the idea of diagnosing and treating illnesses. Drugs with an Akash mahabhuta predominance have a Sanshaman action on the body and can be used as stimulants; drugs with a Vayu mahabhuta predominance act as Sangrahika; and drugs with a high degree of Agni Mahabhut aggravate Jatharagni (digestive fire), which improves digestion. These properties are important in the treatment of disease. Drugs with JalaMahabhuta dominance and Prithvi give the body Brumhana activity [24].

3.2 Tridosa
Tridosha refers to their body humours. According to Ayurveda, there are three fundamental forms of energy, or functional principles, that are present in all things and everyone. These elements are vata, pitta, and kapha, and they can be linked to the five fundamental elements of life and the basic biology and physiology of the human body regarding energy [25].

3.3 Saptadhatus (Seven tissues)
1. Rakta Dhatu: Blood
2. Mamsa Dhatu: Muscles
3. Meda Dhatu: Fat
4. Asthi Dhatu: Bone
5. Majja Dhatu: Bone marrow
6. Shukra Dhatu: Reproductive fluid or semen [20]

4. Ayurvedic medicinal plant use in disease
Since ancient times, various types of medicinal plants and their formulations have been used to improve memory and cognitive function. These plants have the potential to be used therapeutically, inhibit AChE activity, have anti-inflammatory and antioxidant properties, prevent Aβ protein aggregation, hyperpho-sphorylate tau proteins, and have chelating activities for redox metals. Medicinal plants that contain bioactive components have also demonstrated potential positive effects [26]. Nervous system disorders include depressive disorders, anxiety disorders, bipolar disorder, schizophrenia, autism spectrum disorders, conduct disorder, attention-deficit hyperactivity disorder, eating disorders, idiopathic developmental intellectual disability, central nervous system conditions, like Alzheimer's disease (AD) or Parkinson's disease (PD), and a range of other mental disorders. In every nation, neurological problems impact individuals of various ages, genders, income levels, and educational backgrounds [27]. Aromatic plants and their essential oils (EOs) have a long history of use in traditional medicine, and despite playing a significant role in plants adaptation to the constantly changing environment, these compounds also have a multitude of medicinal properties [28].

4.1 Arthritis
4.1.1 Turmeric *(Curcuma longa)*
Native to the Indian subcontinent and Southeast Asia, turmeric is a flowering plant that belongs to the Zingiberaceae family of *gingers*. This rhizome plant's vivid yellow-orange hue is mostly caused by polyphenolic chemicals known as curcuminoids. Because of its antibacterial, antiseptic, and anti-inflammatory properties, turmeric has long been used to treat a wide range of ailments, such as liver detoxification, infection and inflammation prevention, cholesterol balancing, allergy treatment, digestive stimulation, and immune boosting [29]. The pancreatic β-cells are involved in the hypoglycemic and antidiabetic effects of *curcumin. Curcumin* also reduces the amount of insulin that is produced when blood glucose levels are elevated [30].

4.2 Asthma
4.2.1 Saffron *(Crocus sativus)*
The scarlet spice known as saffron is grown extensively in Greece, India, and Iran. Apart from its application in the cosmetics and textile industries, saffron is also suggested for its therapeutic qualities. The carbox-aldehyde safranal is the main ingredient in *saffron*. Studies conducted both *in vitro* and in vivo demonstrate that the phytochemicals found in *saffron* have anti-inflammatory, anti-amyloidogenic, and antioxidant qualities [29].

4.3 Epilepsy
4.3.1 Brahmi *(Bacopa monnieri)*
Ayurvedic and other herbal remedies have acquired growing acceptance since they are found to be safer than the synthetic versions. Plants that have a prabhava (particular action) on the intellect and memory are described as Medhya Rasayana in

Ayurveda, or the Indian medical system, which includes Sushruta Samhita, Charak Samhita, and Atharva Veda (Medhya = intellect or retention, Rasayana = procedure or preparation) [14].

4.4 Diarrhea

Purish-Samgarahaniya Mahakashaya is a collection of medicinal herbal antidiarrheal plants that prevent diarrhoea. These include priyangu (*Callicarpa macrophylla*), Ananta (*Hemidesmus indicus R.B.),* amra seed (*Mangifera indica*), katvanga (*Ailanthus excelsa Roxb*.), lodhra (*Symplocos racemosa*), mocharasa *(Salmalia malabarica Schott and Endl*.), samanga (*Rubia cordifolia*), dhataki flower (*Woodfordia fruticosa*), padma-lotus (*Nelumbo nucifera*), and padma-lotus filaments (*N. nucifera*). ativisha (*Aconitum heterophyllum Wall. ex. Royle*.), bilva (*Aegle marmelos Correa*), utpala, padma, kutaja bark (*Holarrhena antidysenterica* [Linn.] Wall.), gambhari fruit (*Gmelina arborea Roxb*.), prishniparni (*Uraria picta* [Jacq.] Desv. Ex DC.), bala (*Sida cordifolia*) [31].

4.5 Diabettis Mellitus

Madhumeha, a form of Prameha, is the Ayurvedic term for diabetes mellitus. Charaka and
Sushruta divides the 20 types of "Meha" into three categories: "Vata," "Pitta," and "Kapha."
Vataja, Pittaja, and Kaphaja are the three clinical kinds of Madhumeha [32].

4.5.1 Triphala

It is a combination of the preparation of three tropical fruits comprised of equalparts of formulation based on three plants: Phyllanthus emblica, Terminalia bellerica, and T. chebula [33]. The effects of triphala are hypoglycemia. High postprandial blood glucose levels are common in patients with type 2 diabetes, particularly after consuming carbohydrates. The breakdown of carbohydrates by the digestive enzyme alpha-amylase and alpha-glucosidase, as well as the decreased capacity of cells to absorb glucose from the blood, lead to elevated blood glucose [34].

4.6 Cancer

4.6.1 *Curcumin*

One of the main curcuminoids found in the root of the plant *Curcuma longa*, or turmeric, is curcumin (1,7-bis(4-hydroxy-3-methoxyphenyl)-1,6-heptadiene-3,5-dione), also known as diferuloylmethane. *Turmeric* has been used for centuries as a spice in food and as a traditional medicine in China and India [35].

4.6.2 *Butea monosperma*

The medicinal plant butea is well-known for being used as a home cure for a variety of illnesses in many parts of the world. Hepatocellular Hep G2 cancer cell lines are susceptible to the dose-dependent anticancer effects of *Butea monosperma* seed lectin [36].

4.7 Urinary tract infection

Certain formulations and herbs found in the Ayurvedic medicine system are very efficient at treating and controlling urinary tract infections (UTIs), and they may even help prevent the occurrence of this condition altogether. The use of cranberry extracts has long been recognised. Another herb that supports kidney function is Achyranthes aspera, which also ensures appropriate fluid metabolism and further shields the kidney from microbial assault. Tribulus terrestris and Equisetum arvense unblock urinary channels, operate as mild antimicrobials, and are mild diuretics. Ocimum sanctum, sometimes known as holy basil, has long been used as an antibiotic for the urine and to balance the body's acidity [37].

4.7.1 *Amritaprasham*

Asparagus recemosus, Boerhaavia diffusa, Cinnamomum zeylanica, Clerodendrum serratum, Elettaria cardamomum, Embelica officinalis, Garcinia morella, and other herbs are included in the Ayurvedic herbal preparation *Amritaprasham*. *Glabra Glycyrrhiza, Purerira tuberose, Saccharum officinalum, Sida retusa, Vigna vexilata, Vitis vinifera, Hedychium spicatium,* Holstemma annulare, *Macuna pruriens, Mesua ferrea, Phaseolus adenanthus, Phylanthus niruri, Piper longum, P. nigrum, and Zingiber officinale* [35].

4.8 Parkinsons disease [38]

Parkinson's disease (PD) is a neurological condition that progresses over time. Numerous natural items and bioactive chemicals can be used to treat it.

4.8.1 *Curcuma longa*

Studies have demonstrated the anti-inflammatory, chemotherapeutic, antioxidant, woundhealing, anti-proliferative, and antiparasitic qualities of *Curcuma longa (Zingiberaceae).*

4.8.2 *Ginkgo biloba*

A Chinese tree called *Ginkgo biloba (Ginkgoaceae)* has long been used to cure lung and cardiac issues. Among G. biloba's most prevalent components are flavonoids, ginkgolic acid, and terpenoids.

5. Active constituent

5.1 Antibacterial

Both water extract and ethanol exhibit strong antibacterial properties. B. monosperma's silver -conjugated lectin nanoparticles shown strong antimicrobial activity, low resistance, and reduced toxicity. They also had the ability to overcome biomolecular interference, which could improve conjugated lectins' ability to investigate pathogenic microorganisms [36].

5.2 Antiviral

Preclinical research has demonstrated the antiviral qualities of garlic and its oligosaccharides. Shown that aqueous garlic extracts have antiviral properties against coronavirus (both before and after therapy). It has been demonstrated that garlic extracts work well against aqueouscoronavirus-infected embryonic eggs, indicating that they may prevent or reduce viral growth [39].

5.3 Anticancer

Hydroperoxides and peroxides, which can harm biological systems and result in cancer, can be created when lipids and oxygen-free radical mix. By chelating or complexing with the transition metal-free radical initiator, flavonoids can also prevent the formation of free radicals. By modulating Phase I and II enzymes, O. sanctum L. leaf extract prevents chemical carcinogenesis in one or more ways [40].

5.4 Anti-inflammatory

Extracts from butea flowers demonstrated membrane-stabilizing properties and inflammation. In normal human

keratinocytes, hydroethanolic extracts of B. monosperma flowers, butrin, and isobutyric acid demonstrated strong anti-inflammatory effects by reducing proinflammatory cytokines, such as interleukin, which contribute to skin inflammation [36].

6. Conclusion

The development of a traditional medical system that has been influenced by several cultural, philosophical, and scientific factors is reflected in the rich and intricate history of Ayurveda, which spans thousands of years. The fundamental ideas of Ayurveda, such as its view of the human body as being made up of five elements (Pancha Mahabhootas), its definition of health as a balance of physical, moral, and physiological well-being, and its dual goals of preserving the health of the healthy and curing disorders in the sick, have remained remarkably constant over time. Its pathological condition is based on the notions of Panchamahabhuta and Tridoshas.

Physiology, digestion, and metabolism are just a few of the scientific and medicinal sciences to which Ayurveda has made substantial contributions throughout the years. It was also a significant forerunner of contemporary ideas of holistic treatment and sustainability because of its emphasis on the connection between human and environmental well-being.

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