



Ayurveda: Classical Literature, Major Branches, and the Role of Medicinal Plants: A Review

Dolly Saini¹ and Sapan Patel^{1*}

¹School of Studies in Botany, Jiwaji University, Gwalior Madhya Pradesh

* Corresponding author. E-mail: sapanpatelbotany@gmail.com

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ABSTRACT

Ayurveda is one of the world's oldest traditional healthcare systems and continues to play a significant role in preventive and therapeutic medicine. This review synthesizes information from classical Ayurvedic literature, including the Brihat Trayi and Laghu Trayi, together with contemporary scientific publications, to examine the historical development of Ayurveda, the conceptual framework of Ashtanga Ayurveda, and the therapeutic importance of medicinal plants. The review highlights the distinct contributions of major classical texts and discusses their relevance in preserving medical knowledge related to diagnosis, treatment, surgery, pharmacology, and disease prevention. Particular attention is given to medicinal plants widely utilized in Ayurvedic practice and the extent to which traditional claims are supported by modern pharmacological and clinical evidence. The review further evaluates current issues related to botanical authentication, standardization, quality assurance, regulatory requirements, and safety assessment of Ayurvedic medicinal products. Published evidence indicates that quality control and scientific validation remain essential for ensuring the efficacy and safety of herbal formulations. The review also identifies challenges associated with contamination, adulteration, variability of raw materials, and herb-drug interactions. Overall, the integration of classical Ayurvedic knowledge with contemporary scientific research may contribute to evidence-based utilization of medicinal plants and strengthen the future development of Ayurvedic healthcare systems.

INTRODUCTION

Ayurveda is one of the oldest traditional Indian system of medicine originated in India. The term Ayurveda is derived from Sanskrit words “Ayus” (life) and “Veda” (knowledge/science) meaning the “science of life”. [1,2] The knowledge of Ayurveda is described as having gradually developed from ancient Indian traditions of medicine, dietary practices, lifestyle principles, and methods of disease management, all of which played an important role. [3,4] All these indigenous practices and accumulated knowledge formed the foundation of

Ayurveda. From a historical perspective, Ayurveda was not simply borrowed from another civilization. ^(5,6) According to traditional Ayurvedic accounts, the knowledge of Ayurveda was transmitted through a lineage beginning with Brahma, who passed it to Prajapati, then to Ashwini Kumaras, and subsequently to Indra. Different classical texts describe variations of this lineage, including the traditions with Atreya and Dhanvantri. [7]

The lineage of Brahma, Prajapati, Ashwini, Bhardwaja, Atreya, and Dhanvantri reflects the traditional understanding of the origin and transmission of Ayurvedic Knowledge. Although this lineage holds considerable cultural and philosophical significance;

however, these accounts are primarily mythological in nature its historical interpretation requires differentiation between traditional narratives and verifiable historical evidence. The historical development of Ayurveda and scholarly investigations into Ayurveda's development primarily rely on textual analysis, linguistic studies, and archaeological evidences.

In the Ayurvedic system of medicine, medicinal plants form a major component of Ayurvedic healthcare and represent an important source of biologically active compounds. This Indian system of medicine emphasizes a holistic approach to health by considering diet, lifestyle, physical well-being and mental health and environmental factors. Ayurveda advocates not only the prevention and management of the disease but also focuses on comprehensive healing of the individual. ^[8,9] Rather than merely controlling or suppressing symptoms it addresses both the external manifestations and the internal causes of illness. Its therapeutic approach includes the use of medicinal plants and other naturally derived substances is one of the major features; however, their safety and efficacy depend on the specific formulation, dosage, preparation, and quality of the ingredients. Therefore, claims regarding minimal or negligible side effects should be evaluated through appropriate scientific and clinical evidence. ^[10,11]

Although several reviews have explored Ayurvedic philosophy, medicinal plants, and classical texts individually, which addresses medicinal flora, and classical textual traditions as separate domains. An integrated evaluation of these components, encompassing the ashtanga Ayurveda framework, therapeutic applications of medicinal plants, pharmacological evidence, standardization protocols, and safety assessment, remains insufficiently developed. This fragmented approach limits a comprehensive understanding of the relationship between classic ayurvedic principles, the Ashtanga Ayurveda system, and contemporary scientific evidence. The present review aims to examine classical ayurvedic literature alongside contemporary scientific research to understand the relevance of traditional Ayurvedic knowledge in modern healthcare. Particular emphasis is placed on the pharmacological properties of medicinal plants and the challenges associated with quality assurance, standardization, and medicine safety.

LITERATURE SEARCH METHODOLOGY

This narrative review was conducted using literature obtained from PubMed, Google Scholar, Scopus, AYUSH Research Portal, and classical Ayurvedic texts. The search was performed for literature published up to June 2026 using keywords such as "Ayurveda", "Classical Ayurvedic Literature", "Brihat Trayi", "Laghu Trayi", "Ashtanga Ayurveda", "Medicinal Plants", "Quality Control", "Standardization", and "Safety of Ayurvedic Medicines". Classical texts, peer-reviewed journal articles, review papers, pharmacopoeial standards, and regulatory guidelines were included. Sources lacking sufficient bibliographic details, non-verifiable documents, and duplicate records were excluded whenever possible. The selected literature was critically examined to synthesize information regarding Ayurvedic classical literature, major branches of Ayurveda, medicinal plant therapeutics, quality control, and safety aspects.

HISTORICAL DEVELOPMENT OF AYURVEDA

Ayurveda has been the traditional system of healthcare in India for more than 5000 years. The knowledge of Ayurveda was transmitted orally to subsequent generations and eventually transcribed into books. ^[12] According to Indian mythology, Ayurvedic system of medicine origin is considered to be divine. It is believed that Lord Brahma, who is regarded as the creator of the universe in Hindu cosmology, possessed or formulated the complete knowledge of Ayurveda. ^[13] Brahma is said to have possessed or formulated the complete knowledge of Ayurveda. This knowledge of Ayurveda is then subsequently transmitted to one of his great progenitors of creation Daksha Prajapati. Daksha Prajapati then passed the knowledge to the two divine physicians, the Ashwini Kumaras, healers of gods. ^[14,15] This is prominently mentioned in the Vedic literature, particularly in Rigveda. It is said that they possessed exceptional Knowledge of medicine, surgery, rejuvenation and restoration of health. ⁽¹⁶⁾ This knowledge was then imparted to one of the important deity Indra, who is regarded as the king of Gods. According to Hindu mythology, Lord Dhanvantri, who was emerged from cosmic ocean during the Samudra manthana, or churning of the ocean occupies a special and highly revered position in Ayurveda. He is therefore regarded as the divine embodiment of Ayurveda or Father of Ayurvedic medicine. ^[17,18,19]

From this Divine realm, Ayurvedic knowledge was gradually brought to human world through great sages or Rishis. The transmission of Ayurvedic knowledge

was traditionally maintained through oral teacher – disciple (Guru Shishya) tradition in which knowledge was memorized, practiced, interpreted and passed from one generation to another for the benefit of humanity. [20,21] Among these eminent sages, Rishi Bharadwaja is considered one of the most important figures in the early human transmission of Ayurveda. Among the prominent teachers who received and further developed this knowledge was Atreya Punarvasu, who is regarded as the most influential teacher of Ayurvedic medical tradition. [22,23,24,25] Other major figures include Acharya Charaka, who wrote the Charaka Samhita, subsequently, became one of the foundational texts of Ayurveda. After Acharya Charaka, several other prominent sages and scholars like Acharya Sushruta, renowned for contribution to surgery, Sage Kashyapa associated with child healthcare, Acharya Vagbhata also preserved the teachings, practice of Ayurveda in various ancient texts. [26,27] Other notable scholars such as Madhavakara, Sharngadhara and Bhavamishra made significant contributions to the development and preservation of traditional Ayurvedic knowledge. [28,29,30]

CLASSICAL LITERATURE OF AYURVEDA

There are many classical Ayurvedic texts which even today holds the great importance and remain highly influential in the practice and study of Ayurveda. The earliest and most influential foundations of Ayurvedic Literature are represented by the Brihat Trayi, or the “Great Three” consisting of Charaka Samhita, Shushruta Samhita, and Ashtanga Hridaya. [31,32] The Charaka Samhita is primarily concerned with Kaya Chikitsa or internal medicine written by Rishi Charaka. It is based on the earlier teachings of Rishi Atreya Punarvasu, which were compiled by his disciple Agnivesha and later redacted and expanded by Acharya Charaka. [33,34] The Sushruta Samhita is the principal classical text of shalya tantra, or Ayurvedic surgery. It contains detailed description of surgical procedures, surgical instruments, anatomy, dissection, wounds, fractures, dislocations, ulcers, burns, obstetric procedures, plastic and reconstructive techniques, and management of surgical disease. [35,36] It also discusses about various medicinal plants, toxicology, diagnosis, and general principles of treatment, making it an important comprehensive medical text rather than a text limited exclusively to surgery. [37,38]

The charaka Samhita and the Sushruta Samhita differs primarily in the areas of medicinal emphasis. While the former is chiefly concerned with internal

medicine, disease processes, physiological principles, and therapeutic management, the latter provides extensive attention to surgical practices, anatomical knowledge, wound management, and operative procedures. Their association with the Atreya and Dhanvantri traditions, respectively, reflects the diversity of medical scholarship within Ayurveda. Their dating, authorship, and textual redaction remain subjects of scholarly discussion.

The Ashtanga Hridaya, represents the essential principles of Ayurveda in very concise, clear, systematic, and practical forms, covering subjects, such as health, disease, diagnosis, treatment, diet, lifestyle, pharmacology and the eight branches of Ayurvedic medicine. Vagabhata also composed the Ashtanga Sangraha an elaborate work containing detailed and comprehensive compilation of earlier Ayurvedic knowledge drawing particularly from the traditions of Charaka and Sushruta. Both the Ashtanga Hridaya and Ashtanga Sangraha cover all eight branches of Ayurveda, with the Ashtanga Sangraha providing a more detailed compilation and the Ashtanga Hridaya presenting them in a concise and systematic form. The eight major branches (Ashtanga Ayurveda) are Kaya Chikitsa (internal medicine), Shalya Tantra (surgery), Shalakya Tantra (diseases of the eyes, ears, nose, throat, and head), Kaumarabhritya (pediatrics and maternal-child care), Agada Tantra (toxicology), Rasayana Tantra (rejuvenation and healthy longevity), Vajikarana Tantra (reproductive health and fertility), and Bhuta Vidya (traditional management of mental and unexplained disorders). [39,40,41]

Alongside these three foundational works, the Laghu Trayi, or “lesser Three,” became highly influential in later development of Ayurveda. It includes three classical texts: the Madhava Nidana, Sharngadhara Samhita, and Bhavaprakasha. The Madhava Nidana is an important classical Ayurvedic text mainly focused on the diagnosis and disease identification rather than treatment of disease, written by Acharya Madhavakara. It describes the various signs, causes, symptoms, and progression. [42,43] It helps the physicians in the identification and differentiation of diseases based on clinical features. The Sharngadhara Samhita, written by Acharya Sharngadhara. It includes two important aspects the Nadi Pariksha and Bhaishajya Kalpana. [44,45] It explains the different forms of medicines such as decoctions, powders, pastes, oils, pills, fresh juices, and infusions, along with their preparation, dosage and administration. It mainly deals with Ayurvedic Pharmaceutical preparations and practical methods of preparing medicines also called as Bhaishajya Kalpana. While

nadi pariksha provides a method for assessing the patients' health and possible disease conditions through pulse examination. [46,47] Thus, this text combines patient assessment with practical medicine preparation.

The last text of Laghu Trayi is Bhavaprakash, written by Bhavamishra. Its important section Bhavaprakash nighantu, describes various medicinal substances along with their names, properties, taste, potency, therapeutic action, and uses. This study of medicinal substances (Dravya) and their properties or therapeutic effects (Guna). This text explains what a medicinal plant or substance is, what properties it has, and how it is used to treat disease. [48,49,50]

After the Brihat Trayi and Laghu Trayi there are several other important texts that further contributed to the development of Ayurveda. The ancient Kashyapa Samhita, written by Sage Kashyapa deals with child health, pediatrics, and maternal care. [51,52] The Chakradatta, written by Chakrapani Datta, mainly includes information about practical treatments, methods, and medicinal formulations. [53,54] The ancient text Gadanigraha, written by Sodhala, discusses diseases, diagnosis, treatment, and various medicinal formulations. [55,56] While the ancient Vangasena Samhita, written by Vangasena, provides extensive information about medicines, therapeutics, and diseases. [57,58] In the field of Rasashastra and Ayurvedic pharmaceuticals, important works include the Rasa Ratna Samuccaya, attributed to Vagbhata, which includes important information on metals, minerals, mercury, their purification processes, and medicinal preparations. [59,60] The Rasa Tarangini, attributed to Sadananda Sharma, includes information about various types of minerals and metallic substances and their pharmaceutical preparations. [61,62] Important medicinal-plant and materia-medica texts include the Dhanvantari Nighantu, Madanapala Nighantu, Raja Nighantu by Narahari Pandita, Kaiyadeva Nighantu by Kaiyadeva, and Shodhala Nighantu by Shodhala, which describe medicinal substances, their properties, actions, and therapeutic uses. Together, these texts helped preserve and expand Ayurvedic knowledge of diagnosis, therapeutics, medicinal plants, pharmacology, and pharmaceutical preparations. [63,64]

MAJOR BRANCHES OF AYURVEDA

Ayurveda is a broad and comprehensive system of traditional healthcare. This Indian system of medicine encompasses a wide range of preventive, promotive, and therapeutic approaches for maintaining health and managing diseases. Ayurveda is traditionally or-

ganized into 8 major branches, collectively known as Ashtanga Ayurveda. [65] These eight branches represent different areas of healthcare and collectively provide a comprehensive framework for the prevention, diagnosis and management of various health conditions. The eight branches include Kaya Chikitsa, Shalya Tantra, Shalakya Tantra, Kaumarabhritya, Agada Tantra, Rasayana Tantra, Vajikarana Tantra, and Bhuta Vidya. [66,67]

Kaya Chikitsa is one of the principal branches of Ayurveda concerned with the prevention, diagnosis, and management of diseases through internal therapeutic approaches. Kaya Chikitsa encompasses a wide range of systemic disorders, particularly those affecting the digestive, metabolic, respiratory, and the other physiological systems. It primarily addresses disorders associated with the imbalance of the three Doshas - Vata, Pitta and Kapha. [68] Shalya Tantra is the branch of Ayurveda that deals with surgical procedures and the treatment of disorders requiring operative and para-surgical interventions. Shalya Tantra addresses conditions such as wounds, abscesses, foreign bodies, fractures, and other disorders requiring surgical management. [69] Shalakya Tantra deals primarily with disorders affecting structures located above the clavicle, including the eyes, ears, nose, throat, mouth, and head. This branch of Ayurveda mainly

deals with the ophthalmic, otic, nasal, oral, and throat disorders. [70] Kumarabhritya is another branch, concerned with the health, development, nutrition, and diseases of infant and children. It includes management of various aspects of maternal and infant care, like breastfeeding, nutrition, growth, development, prevention, and treatment of diseases in children. [71] Agada Tantra represents an important early framework of toxicological conditions. This Branch of Ayurveda mainly deals with the poison, toxic substances, envenomation, and their management. It includes traditional understanding of poisoning caused by plants, animals, minerals, food, and other harmful substances. [72] Rasayana Tantra focuses on the preservation of well-being, maintenance of health, promotion of longevity, maintenance of vitality and improvement of physical and mental functions. The concept of Rasayana emphasizes mainly on nourishment, rejuvenation, resistance to diseases and healthy aging. [73] Vajikaran Tantra is the branch, which represents the reproductive and fertility - related dimensions of Ayurvedic Healthcare. It deals with the reproductive health, sexual well-being, fertility, and the maintenance of the Reproductive vitality, support fertility, and maintain physical and psychological well-being. [74] Bhut Vidya is traditionally

regarded as the branch of Ayurveda concerned with disorders affecting mental and psychological well-being. Bhut Vidya is the branch which reflects the broader holistic approach of Ayurveda, in which physical, mental, and behavioural aspects of healthcare are considered interconnected. [75]

Collectively, these eight branches illustrate the comprehensive and multidimensional nature of Ayurveda, covering different aspects of healthcare extending from internal medicine and surgery to paediatrics, toxicology, rejuvenation, reproductive health, and mental well-being. The extensive use of medicinal plants across these branches highlights their central role in translating classical Ayurvedic knowledge into therapeutic practice. [76]

ROLE AND THERAPEUTIC SIGNIFICANCE OF MEDICINAL PLANTS IN AYURVEDA

The association between Ayurveda and medicinal plants is dates back to ancient times. The medicinal plants are the fundamental components of Ayurvedic Healthcare. The medicinal plants have played a central role in the development and practice of Ayurveda as they constitute the one of the major sources of therapeutic substances used in Ayurvedic medicines. In Ayurveda, in various ancient texts a wide range of medicinal plants are described along with their properties, therapeutic actions, methods of preparation, dosage and application in different health conditions. [77,78] So, without the knowledge, availability and therapeutic application of medicinal plants, the traditional practice of Ayurveda would be incomplete. Medicinal plants are traditionally selected and used according to their specific properties, including taste (Rasa), qualities (Guna), potency (Virya), and post-digestive effect (Vipaka), which are considered important for understanding their effects on the body. [79,80] They are incorporated into different Ayurvedic preparations such as decoctions, powders, pastes, oils, fresh juices, pills, and other formulations. Medicinal plants are traditionally used for various health conditions. [81] One of the most important Rasayana plant is Ashwagandha *Withania somnifera*(L.)Dunal, traditionally used to promote strength, vitality, physical endurance, general nourishment, and healthy sleep, it is also known as a rejuvenating herb. This herb is used to treat conditions associated with weakness, fatigue, stress, and nervous system imbalance. Modern clinical studies also suggest that *Withania somnifera* may improve stress management, sleep quality, and selected cognitive parameters. However, larger randomized controlled trials are still

required to confirm long-term efficacy and safety.

Ashwagandha is included in various Ayurvedic formulations like Ashwagandha churna, Ashwagandha lehyam/Avaleh and Ashwagandha Ghrita. [82] *Cissus quadrangularis* commonly known as Hadjod or Asthisamhara is used for treating various bone related disorders like fractures, bone weakness, joint discomfort, and musculoskeletal problems. Ayurvedic preparations Asthisamhara churna, Hadjod formulations and other medicated preparations are used traditionally for bone and joint health. [83] In Ayurveda a well-known bitter medicinal herb *Andrographis paniculata* (Kalmegh) is widely used to treat various digestive disorders, loss of appetite, intermittent fevers and liver associated conditions. Kalmegh is combined with other hepatoprotective or digestive herbs to make various Ayurvedic formulations. Scientific evidence supports anti-inflammatory and immunomodulatory properties, although further clinical validation is necessary for several traditional therapeutic claims. [84] In Ayurveda one of the best-known and widely used plant associated with memory, learning, concentration, and cognitive function is *Bacopa monnieri* commonly known as Brahmi. It is traditionally used to treat various neurodegenerative disorders, memory problems, mental fatigue, memory problems, nervousness, and supporting concentration. Brahmi-based syrups are mainly found in Ayurveda. Several clinical and experimental studies support the potential cognitive-enhancing effects of *Bacopa monnieri*. Nevertheless, variations in study design and formulations indicate a need for further standardization. [85] Similarly, Medicinal plant *Convolvulus pluricaulis* (Shankapushpi) is also used to treat various mind disorders like in mental relaxation, sleep-related disorders, memory and concentration problems. In Ayurveda its classical preparations include Shankapushpi-based syrups and churna. [86] In the Ayurvedic context, *Barleria prionitis* commonly known as Vajradanti is especially well known for its traditional use oral and dental health. It is used to treat toothache, gum problems, mouth ulcers, and inflammation of the oral cavity. [87] Another important medicinal plant *Adhatoda vasaca* (Malabar nut) is particularly valued traditionally for treating cough, bronchitis, asthma, excessive mucus, and other respiratory complaints. [88] While *Tinospora cordifolia* commonly known as Guduchi or Giloy is traditionally regarded as Rasayana in Ayurveda. It is employed for fever, general weakness, digestive disturbances, convalescence, enhances immunity and controls blood sugar. Experimental studies demonstrate immunomodulatory and antioxidant activities; however, isolated reports of

hepatotoxicity have also been documented, emphasizing the importance of quality assurance and responsible use. Ayurvedic Preparations include Guduchi churna, Guduchi satva, Guduchyadi Kwatha and Amritaristha. [89] This herb also claims to boost immunity, *Phyllanthus emblica*, or Amla one of the widely used herb not only in Ayurveda, but also being used in every household since ancient times. [90] Its fruit is traditionally used for treating digestive health, general nourishment, vitality, and rejuvenation and it is mainly used for its high content of Vitamin C. It is the major component of several classical Ayurvedic formulations. It is one of the three ingredients of triphala, together with haritaki (*Terminalia chebula*), and Bibhitaki (*Terminalia bellirica*), and is also a major ingredient of Chyawanprash. [91,92] Although similarly, *Ocimum sanctum* (Tulsi) is highly valued medicinal and aromatic plant in Ayurveda. It is traditionally used in treating cough, cold, respiratory discomfort, digestive problems, and general well-being. [93,94]

QUALITY CONTROL, STANDARDIZATION AND SAFETY OF AYURVEDIC MEDICINES

Medicinal Plants constitute a fundamental component of Ayurvedic Therapeutics, as they serve as an important source in the preparation of traditional medicines. Their therapeutic efficacy and clinical value largely depend on their authenticity, quality, proper preparation, safety, dosage, and appropriate use. Accurate botanical identification is therefore essential to prevent adulteration, substitution, or misidentification of medicinal species. The Quality of Ayurvedic medicinal preparations is strongly influenced by appropriate collection, drying, processing, and storage practices. Which helps in maintaining the quality, consistency, and therapeutic value of herbal preparations. [95,96] The quality assessment of Ayurvedic medicines should align with standards established by the Ayurvedic Pharmacopoeia of India (API), World Health Organization (WHO) guidelines on herbal medicines, and regulatory frameworks developed by the Central Drugs Standard Control Organization (CDSCO). These standards include botanical authentication, physicochemical evaluation, microbial testing, contaminant analysis, and chromatographic fingerprinting. Several studies have reported contamination of certain Ayurvedic products with heavy metals such as lead, mercury, and arsenic, indicating the need for rigorous quality control and post-marketing surveillance.

Quality control and standardization provide a scientific basis for ensuring the identity, purity, strength,

and consistency of Ayurvedic medicinal products. [97] Physicochemical evaluation, phytochemical profiling, and modern analytical techniques, including chromatographic and spectroscopic methods can be used to characterize medicinal materials and establish appropriate quality parameters. This Evaluation is important because the variations in raw materials and manufacturing practices can influence the concentration of active or characteristic constituents and consequently therapeutic performance. [98] Safety assessment should also be considered an important aspect alongside quality. The perception that plant-based medicines are inherently safe may overlook risks associated with incorrect identification, inappropriate dosage, prolonged use, contamination, or interactions with conventional medicines. Therefore, appropriate quality control procedures and evidence-based safety evaluation are essential to minimize potential adverse effects and support responsible use. Hence, safety is an equally important consideration in the contemporary use of Ayurvedic medicinal plants. [99,100] Published studies have documented safety concerns associated with some herbal and herbo-mineral formulations, including heavy metal contamination, herb-drug interactions, and rare cases of hepatotoxicity. Such reports do not invalidate Ayurvedic medicine as a whole but underscore the importance of standardized manufacturing practices, pharmacovigilance, accurate labeling, and evidence-based clinical use.

CONCLUSION

This review has certain limitations. The discussion primarily focuses on Ayurvedic literature and does not comprehensively examine other traditional Indian medical systems such as Siddha and Unani medicine. The review follows a narrative approach and therefore does not employ a systematic review methodology or PRISMA framework. Additionally, only accessible published sources were considered, whereas unpublished and grey literature were not comprehensively assessed. These limitations may influence the completeness and generalizability of the conclusions presented. Ayurveda continues to represent an important traditional healthcare system with a rich textual foundation and extensive use of medicinal plants. Classical Ayurvedic literature remains valuable for understanding traditional medical concepts, disease management approaches, and therapeutic practices. Contemporary scientific evidence supports several traditional applications of medicinal plants; however, the strength of evidence varies among different species and formula-

tions. Therefore, future research should prioritize well-designed clinical trials, pharmacological investigations, and standardization studies. Regulatory agencies, researchers, and industry stakeholders should work together to strengthen pharmacopoeial standards, improve quality assurance, and enhance pharmacovigilance systems. Such efforts may facilitate the safe and evidence-based integration of Ayurveda into modern healthcare while preserving its traditional knowledge systems.

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