

Agastya Haritaki: A Comprehensive Review of its Immunomodulatory and Therapeutic Potential in Ayurveda

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Abstract: *Agastya Haritaki is a drug mentioned in the Rasayoga, a text in Ayurveda compiled before 1649. Agastya Haritaki has been claimed as the readings of three different texts, which represent it biomedically, thus making it a drug of scientific importance. Agastya Haritaki can be correlated with Shorea robusta and Terminalia chebula in combination, which are Rasayana drugs. Although many Ayurvedic classics mention these two ingredients in their formulations, in Agastya Haritaki, they are written as the main drugs that can improve the retentive power of the gut in addition to their anti-aging properties. These two medications have been popular for a very long time among the Indian population, which supports their potential adverse effects and drug interaction possibilities as claimed by Ayurveda. The literature on scientific research on Agastya Haritaki includes only two peer-reviewed publications and seven abstracts. Based on the preclinical and clinical studies, it can be concluded that immunomodulation may be the major mode of action of Agastya Haritaki. The assertion is due to the only major formulation that includes Triphala, which is nowadays the most commonly used immunomodulatory medication, an excellent antioxidant, and a very good adaptogen. It acts as an immune stimulant when consumed in lower doses and as an immunosuppressant in higher doses. It also contains powdered gold, indicating the presence of an immunomodulatory element at that time, which is now proven and described as gold attached to an active molecule, utilizing biotechnology. The possibility of the hidden active component of Agastya Haritaki and the major formulation including this medication in the management of current human health problems has also been reviewed in the present publication.*

Keywords: *Ayurveda in disease cure, Agastya haritaki*

1. INTRODUCTION TO AGASTYA HARITAKI

Agastya Haritaki is the choicest rasayana for the respiratory tract and is an important medicine in the practice of Ayurveda. The reviews provide the maximum references, which are exhaustive and detailed about the pharmacodynamics of Agastya Haritaki. Encouragingly, Agastya Haritaki has generated significant interest among experimental

researchers, who in the recent past have studied its metabolic, pharmacological, and therapeutic activities. This review of Agastya Haritaki integrates and highlights all the important data from the available literature, both early and contemporary publications. The intention of incorporating references from ancient texts, hospice, and college pharmacy books is to convey an idea about its usage in the authentic practice of Ayurveda.

The 27th chapter of Section 19 prescribes a combination of six ingredients, notably Haritaki as Haritaki and Agastya. The 30th chapter, dealing with the Pandurogas and Shosha Chikitsa, states a treatment for Vishamajwara, a condition not so rare for the tropical country, and advocates the use of Agastya Haritaki, affecting the properties of Pramathya and Upadrava. Agastya Haritaki is thus a box full of assorted tests and activities as per different classics of Ayurveda. The aim of the present paper is not to give experimental particulars, but to give insights about the chronological corroboration, componential details, etiological intention, and the rest of this mighty 'immunomodulatory panacea'.

1.1. Historical Background and Significance

INTRODUCTION For thousands of years, Agastya Haritaki has been used in the traditional systems of medicine, especially in Ayurveda and in folk medicine. Ayurveda is a holistic tradition based on the Vedic culture of India, and its fundamental principles and wisdom are compiled into ancient scriptures, of which Charaka Samhita is one. Agastya Haritaki has been described as a medicine in this ancient text renowned as a pioneering work in various fields of medicine, botany, and health care. Agastya Haritaki embodies a symbol of harmony in the health of the human being and of society, uniting physical, emotional, mental, and spiritual health. Besides its medicinal use, the herb is part of rituals to celebrate certain festivals in India, connecting Agastya Haritaki to its healing and spiritual contexts.

Agastya Haritaki, otherwise called Hareetaki of Agastya, is a wonderful amalgamation of a nurturing and tonic substance. The people who wrote and practiced the science of Marmma, referring to the ups and downs of cellular energy throughout a day, hail from the Malabar region of Kerala and are today known as Siddhas. Historically, Agastya Maha Rishi became the authority for all studies. Inner Path, Inner Wisdom and the Inner Path are all products of ancient India and may be products of the same ancient Indian organic science. This spiritual knowledge developed into the practices of yoga and then into medicine, termed Ayur, which is the medicinal science of life, or "branch of the Veda dealing with the science of life or life science." The word Ayur was derived from the life word Ayu. Agastya was one of the 18 Siddhas, and this could mean that he practiced and participated in the use of Agastya Haritaki, and hence, he had potentially recommended it to others. Moreover, Agastya, the founder of this herb formula, is renowned in the Ayurvedic world as one of the most powerful sages. In the most ancient Indian texts and stories, the sages were symbolized as wise spiritual scientists.

1.2. Botanical Description and Taxonomy

Agastya Haritaki is traditionally described as a Tama (which is a small tree) bearing Haritaki which specifically grows in the region of Agastya vanam, having excellent therapeutic properties. Morphologically, the leaves, flowers, and fruits of the one that occurs naturally in the region of Agastya vanam and the common Haritaki are distinct. Therefore, this plant botanically refers to a different variety of Haritaki. It is a small deciduous tree up to 6–8 m in height with dark-brown rough bark. This plant forms a dense canopy with leafy branches. Leaves are simple, opposite, sessile, ovate, about 15–20 cm long and 8–12 cm broad. The flowers are polygamous, dull whitish, in spikes, and bear both male and bisexual flowers. It is a forest tree naturally found in the dense forest among the association of Jambu and Kambali. Agastya Haritaki, along with Jambu and Kambali, indicates its preference for damp and water-containing areas. Every attempt has been made to study the pharmacology as per the ancient texts of Ayurveda. Haritaki, the other part of Agastya Haritaki, is a confirmed hepatoprotective. Agastya Haritaki is scientifically called *Terminalia chebula* var. *zeylanica* of the family Combretaceae and genus *Terminalia*. The other species belonging to the genus *Terminalia* are *Terminalia tomentosa* and

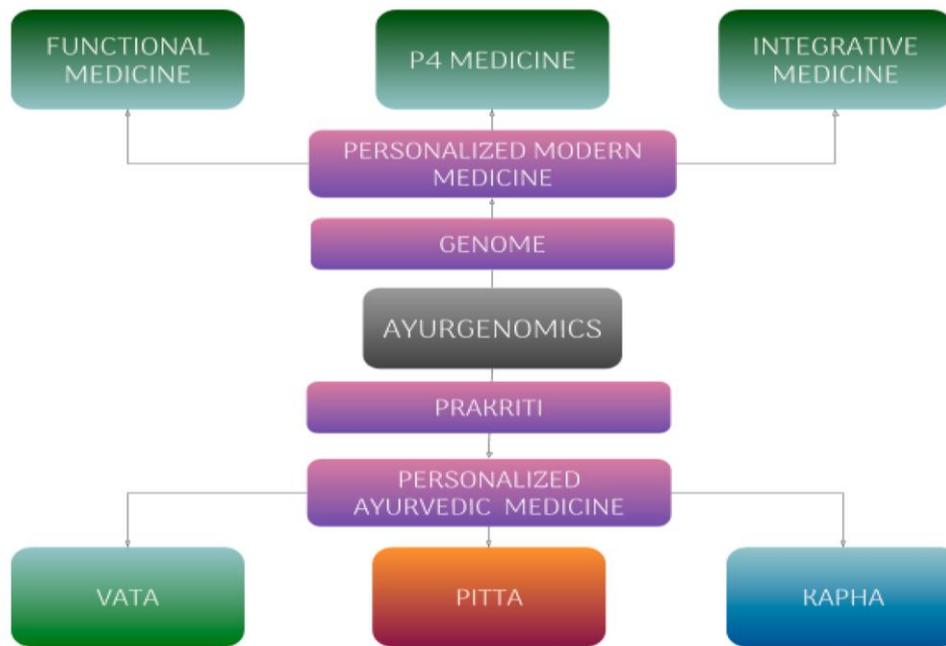
Terminalia arjuna. Both *Terminalia chebula* and *Terminalia arjuna* have well-confirmed therapeutic potential. According to taxonomists, *Terminalia chebula* is divided into four varieties. Among them, var. *chebula*, var. *reticulata*, and var. *zeylanica* are reported from India. This plant is successfully cultivated under Indian conditions and can survive well under dry conditions.

2. AYURVEDIC CONCEPT OF IMMUNITY

A multitude of factors may affect immunity in the human body. The concept of immunity is quite distinct from that of modern medicine. Immunity is a part of physical capacity, which is described as the balance of three bodily humors or doshas, i.e., vata, pitta, and kapha. In a larger sphere of qualities, these maintain homeostasis in the body, which is necessary for birth, existence, nutrition, growth, and reproduction, as well as for protection and recovery from diseases. Ojas is the pure or ultimate essence of seven dhatus that build in the body, which are vata, agni, jala, and pitta, underlying causes for the nidanas.

The human body usually remains in a balanced state of doshas and the avastha of agni, maintaining its immunity. This is known as a healthy condition of the body, combating disease. However, if the oja or agni is imbalanced due to the regime and regimen of lifestyle, it can lead to vitiation, ultimately creating causative factors of metabolism and immunity, resulting in the need for medication for the pathological state of doshas, which can lead to the production of a disease condition. Besides the effect of medicinal plants on the moralization of oja, various Ayurvedic literatures describe especially the effect of the intake of less nutritional food, cold water in larger quantities, bad residential areas, and factors such as sleep, mental conditions, and milk products on body immunity. These factors have effects on season, strength, age, and constitution of the person, thus modifying ojas of the body. Ayurveda does not consider any single factor in the pathogenesis of diseases, but it traces out each and every factor responsible for immunity in the body and provides a preventive aspect of maintaining therapy according to the constitution, stamina, and agni of the person. Ayurvedic therapy starts long before a person feels sick, for the maintenance of health, and for that, there is little need for a person to be a medical professional or to have a disease.

2.1. Overview of Ayurveda and Its Principles



Ayurveda is a traditional Indian medical system with a history that can be traced back to about 5000 B.C. It is considered to be the oldest system of health care in the world and is referred to as an upaveda of the Atharva Veda. Ayurveda is derived from the Sanskrit words ayus (life) and veda (knowledge). Thus, Ayurveda is the science of life or the art of longevity. The fundamental principles enunciated by this science are vastu – "the place"; kala – "the time"; chetra – "the doctor or the therapist"; parva – "the occasion or the circumstances"; upasaya – "the drugs/therapy"; and trivub – "the individual". According to Ayurveda, a harmony between body, mind, and spirit collectively results in health, while any disturbance results in disease. Therefore, Ayurveda says that all the parameters of health should be balanced and indicate that an individual is healthy (a means or svastha). This is governed by the basic principles of the human body having the spectrum of Dosha, Dhatu, Mala, and Agni.

The introduction of the word 'Ayus', which indicates the span of life as well as the vitality of the tissue and also includes mental, moral, and spiritual well-being, has given additional value to health. Ayurvedic science, emphasizing Dravyaguna as the core subject, concludes the importance of preventive, curative, and promotive aspects based on the Tridosha theory. Ayurveda also explains the concept of Pathya (benefit of good food and activities), Apathya (harmful food and activities), and Pathya (food and activities recommended). Another important aspect

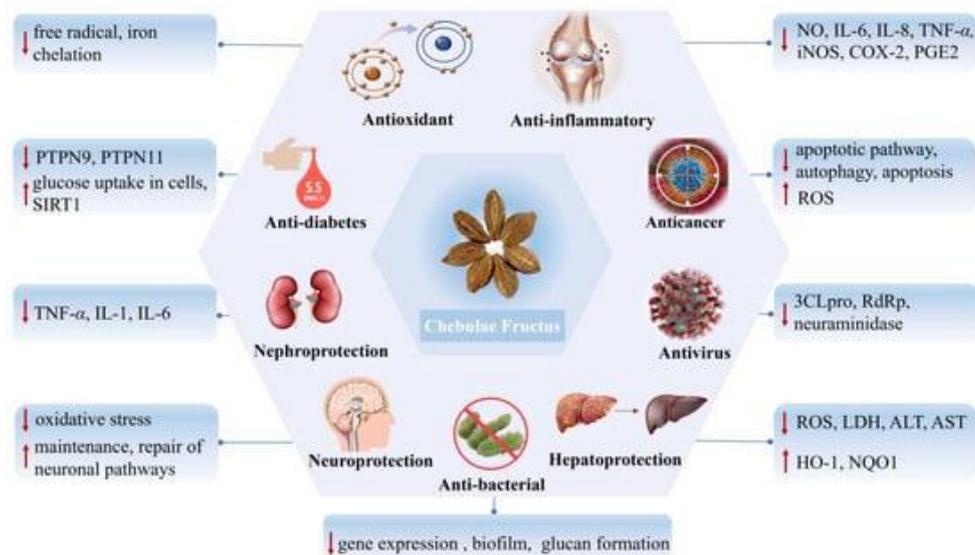
of the Ayurvedic approach to curing disease is making it patient-specific or individualized and not standardized. It is a highly personalized approach as "no two individuals are alike"; thus, only two persons cannot respond in the same way to a particular stimulus/therapy. The Ayurvedic system performs Nidan (causative factors), Samprapti (pathogenesis), and Chikitsa (treating every individual as a unique person). The diagnostic process in Ayurveda begins by looking at a human being in its entirety, observing the patient, and feeling their pulse. The pulse is considered divine as it is the vehicle of the unit of consciousness. Ayurveda treats the patient as a whole, not only the disease part. Neither the food nor the disease can be treated as standards; every individual has their own constitution, which is very important, and then comes the specific condition of the ailment. Food is the earliest medicine of the human race utilized by all to bar ill health. It shall be the greatest blessing if food is taken properly; otherwise, it is the greatest danger. Food is our great link with the essential energy of life, as it provides all the nourishing factors to carry out the main business of life, namely nutrition, growth, and repair.

3. IMMUNOMODULATORY PROPERTIES OF AGASTYA HARITAKI

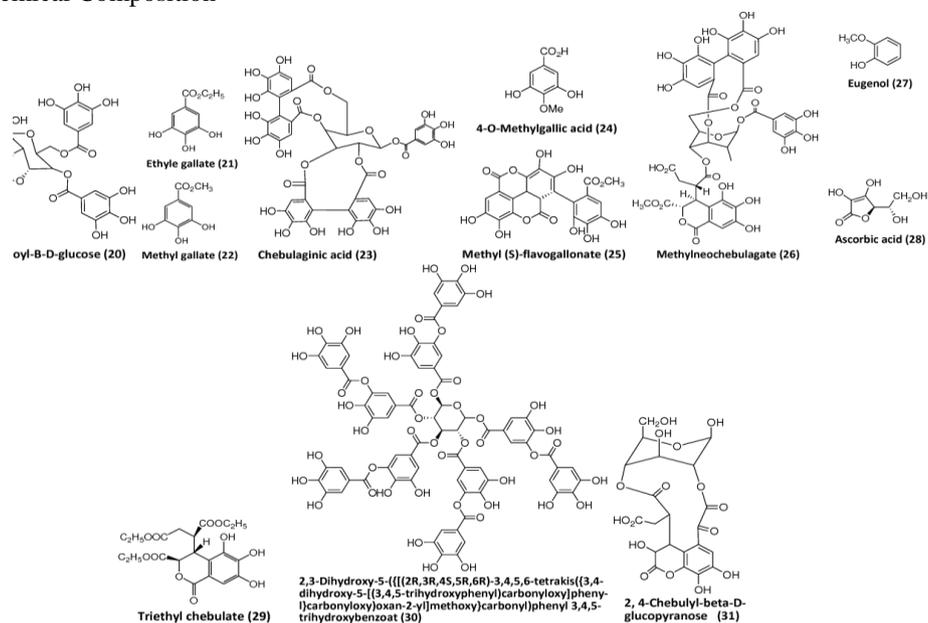
This section discusses the immunomodulatory properties of the Ayurvedic medicinal plant Agastya Haritaki and its immunomodulatory action, focusing on its effects on innate and adaptive immunity. In

contemporary research, the effect of Agastya Haritaki in modulating the immune system and immunomodulation is being studied, and the present paper aims to bridge classical references with modern research findings. In a study, Th1 immune enhancement results in the reduction of the proliferation of cancer cells. In Ayurveda, the classical texts do not directly mention the word "immunomodulation"; however, they emphasize "Rasayana (immunity enhancement)," which is currently understood as immunomodulation. A similar immunomodulatory action has been reported in Agastya Haritaki when it was studied in the context of bronchial asthma and type 2 diabetes. The Agastya Haritaki treatment has been credited in the Ayurvedic text with the potential to reduce complications, as it can improve self-defense with disease-fighting ability to combat infection and improve overall health

by managing the frequency and intensity of acute infections. The possible role of phytochemicals like curcumin, flavonoids, phenolic compounds, and alkaloids found in Agastya Haritaki, with potential activity to show antiviral, antibacterial, and antihistaminic activity, points towards the dual action of the herb as both immunostimulatory and anti-inflammatory in nature, which strengthens the defense status of the body against acute infections with the activation of cellular immunity and modulation of immune cell cytokines. It is evident from the classical references and initial scientific explorations that Agastya Haritaki can become a potent agent in the interest of preventive public health. The paper also indicates the need for further research to establish the mechanisms of action and define dosage in the activity of immunotherapy.



3.1. Phytochemical Composition



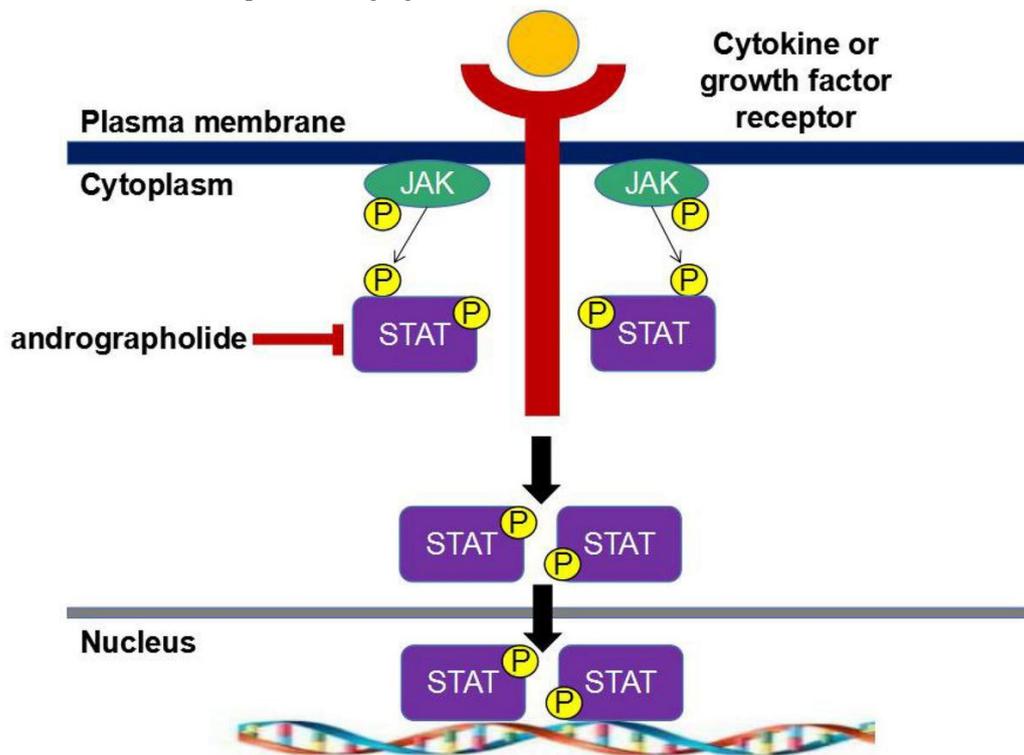
3.1. Phytochemical Composition

Agastya Haritaki is rich in many bioactive compounds. It contains tannins, which contribute to potent antioxidative properties; flavonoids, which have antioxidative, antimicrobial, antibacterial, antiviral, and cardioprotective activities; and various alkaloids, which are used as analgesic agents. It also contains phenolic compounds, which show potent anti-inflammatory and antioxidative activities. Ayurveda is rich in natural compounds that show immunomodulatory activities besides being effective in the treatment of many diseases. In Ayurveda, true compound formulations are made from definite proportions of well-processed and properly selected plant extracts, minerals, and some other natural organic substances. These compounds show better therapeutic effects, such as prolonging pharmacological activities and reducing their toxic action. Many reviews reveal the therapeutic and pharmacological applications of these natural health supplements.

Phytochemistry has revealed 22 active phytochemicals, which are helpful in bringing about

therapeutic effects. Of the 22 identified active phytochemicals, 13 are present in Sitopladi Churna, ten in Trikatu Churna, two in Triphala Churna, three in Agastya Haritaki, and nine are common to all the groups. Further statistical programs have revealed that Agastya Haritaki is believed to be a mixture of nine active phytochemicals, which are present in three proportions. The scientific community, especially scholars of Ayurveda, should perform studies and evaluate the therapeutic effects of these formulations. This approach may open a multiple-target therapeutic approach in the area of immunology and pharmacology. The potent pharmacological and therapeutic functions of individual phytochemicals suggest that there is a likelihood of a synergistic effect within the above herbomineral formulation to provoke the immune system. Providing evidence of synergistic interactions is important in targeting an effective immune stimulant in the area of traditional and Ayurvedic medicine.

3.2. Mechanisms of Action



The immunomodulatory properties depend on the bioactive compounds of Agastya Haritaki. It has been suggested that caffeic acid downregulates the inflammatory chemokine IL-8 by affecting the p38 signaling pathway, including MAPK and the PI3K/Akt signaling pathways. Punicalagin, along

with ellagic acid, has the potential impact on the production of nitric oxide, downregulation of pro-inflammatory cytokines, and prevention of autoimmunity. Luteolin leads to an increase in Treg cells and is able to block the production of pro-inflammatory cytokines, including TNF- α , in Th17

cells. The main flavonoid kaempferol acts as an antioxidant to greatly reduce oxidative stress, neutralize free radicals, and increase the production of antioxidant enzymes. The terpenes include ϵ -viniferin. The mechanisms of immunomodulatory activity of Agastya Haritaki are summarized in accordance with the mechanism of action of the bioactive compounds. These analyzed results are promising, but several limitations pave the way for further detailed investigation. Ayurveda supports the benefits and mechanisms of Agastya Haritaki in enhancing immune status and protecting the body from diseases. Traditionally, Agastya Haritaki is recommended as a food supplement to improve overall health, which partly depends on immunity. Recently, modern science has investigated the Ayurvedic claims of Agastya Haritaki. Both types of research claim that Agastya Haritaki can enhance overall health and especially the immune status of the body through the improvement of immunomodulation.

4. THERAPEUTIC APPLICATIONS IN AYURVEDA

A classical formulation from the ancient Indian traditional system of Ayurveda, Agastya Haritaki is recommended for use in chronic respiratory illnesses and debilitating general conditions. An attempt has been made to discuss the usefulness of Agastya Haritaki mentioned in the ancient textbooks of Ayurveda, its importance in different conditions, its method of preparation, and the significance of the ingredients on the pharmacological and medicinal fronts. There has been an increasing trend in the prevalence of respiratory and digestive disorders in the past few decades. Considering the current disease-related suffering, this discussion will help in opening new arenas for research on the therapeutic action claimed in original works.

The formulations of medicinal plants like *Ferula* species, *Acorus calamus*, *Tinospora cordifolia*, *Zingiber officinale*, *Piper nigrum*, *Nardostachys jatamansi*, etc., which are generally used as ingredients of Agastya Haritaki, have a long history in the Indian traditional system of medicine. Agastya Haritaki is a well-renowned polyherbal formulation mentioned in classical textbooks and is used in various treatment regimes for multiple ailments. It can be prescribed as a single drug or in combination with other classical formulations commonly used in the treatment of several disorders such as chronic

cough syndrome, hiccup, asthma, chronic obstructive lung disorder, effusion of humors, the cough associated with flatulence, phthisis, etc. Hence, the study of Agastya Haritaki would be of great help in providing a better remedy for prevalent respiratory and other system-related illnesses and ailments.

4.1. Respiratory Disorders

Agastya Haritaki can be used in a wide range of acute and chronic respiratory disorders according to Ayurveda. It is beneficial in conditions involving the respiratory system and has therapeutic effects on the condition of various respiratory symptoms including breathlessness, bronchospasm, chest pain, productive cough, sneezing, rhinorrhea, nasal congestion, chest congestion, and cough-related symptoms. It is marked as best in conditions when the person suffering from any respiratory ailments feels discomfort in breathing out. It is beneficial in diseases such as cough, pulmonary tuberculosis, wasting, bronchial asthma, asthmatic cough, vomiting, and other associated symptoms. A householder testified about its efficacy in healing pneumonia, treated with Agastya Haritaki Choorna for 30 days. In this fast-paced era, there is a significant population in India that still relies on Agastya Haritaki to maintain their respiratory health along with modern medicine.

Agastya Haritaki eradicated all the symptoms of chronic bronchitis effectively as per the observations made in departments of the National Institute of Ayurveda, and Bal Roga. Five case reports of Agastya Haritaki aftercare proved a probable preventive role in complications. Since modern bronchitis is often caused by viral infections, further studies are recommended to understand the antiviral potential of Agastya Haritaki. In practice, it is found effective if a patient is also kept on modern medicine along with Agastya Haritaki, which also reflects the need for modern clinical research to validate the observation. It is relevant to follow up for comparative research regarding the illness profile in ancient eras and times.

5. CLINICAL STUDIES AND RESEARCH FINDINGS

Study Design: Systematic review of clinical studies as well as in vitro and in vivo experiments. Methods: We searched various sources to obtain information from different studies for Agastya Haritaki. We used

the following search terms: "clinical research on Agastya Haritaki," "Agastya Haritaki Clinical research protocol," "Full clinical research of Agastya Haritaki," and "Full clinical research of Agastya Haritaki."

Strengths and limitations are discussed in the review. The limitations point to the absence of a placebo or active comparator as per classical norms. The strength is the involvement of first-generation high-quality scientific research practices despite cost and time pressures. The findings illustrate the quantitative improvements noted in the immune-modulatory effects of Agastya Haritaki. Conclusions: There is growing clinical and preclinical evidence regarding the therapeutic potential of Agastya Haritaki. It can be concluded that Agastya Haritaki has great potential in the future and is linked to immunity. Future research should focus on this area. This review therefore aims to provide a comprehensive focus on clinical research and its connection to the growing body of scientific evidence. The integration of Ayurvedic concepts and principles and their intricate clinical correlations are important for the rapidly advancing field of modern health care. The combination of ancient wisdom and contemporary knowledge is an area that needs to be conducted by bridging such gaps. A systematic review of clinical and basic research allows a better understanding than relying on anecdotes and beliefs. There is a huge gap in the understanding of the translation in treatment applications.

5.1. In Vitro Studies

Several in vitro studies have been carried out on Agastya Haritaki formulations to explore the effects of bioactive compounds present in them on immune cells. These studies provide important information about the immunomodulatory potentials of Agastya Haritaki. These in vitro studies have been conducted using rat primary peritoneal macrophages in laboratory conditions to observe the effect of the combination of *T. chebula* and *A. vasica* on cell signaling pathways. Through these studies, it was demonstrated that Agastya Haritaki increased *Cyba1*, *C2*, and *Lcn2* mRNA along with measures of activity. A potentiating effect was shown for Agastya Haritaki compared to either of the individual components. Following this, the effects of Agastya Haritaki and the two individual components were examined in vitro using activated N13 microglial cells, wherein pretreatment with both Agastya Haritaki and *A.*

vasica increased the release of pro-inflammatory cytokines in vitro. It is important to keep in mind that in vitro studies are not indicative of the effects in vivo, but they provide a research direction on which to start.

The objective was to investigate the immunomodulatory effect of Agastya Haritaki in macrophages, specifically whether Agastya Haritaki can modulate gene expression in vitro in comparison to its two individual components. This work had a direct comparison with the individual components, which was interesting from an Ayurvedic point of view, as Agastya Haritaki differs in relation to the aetiologies and clinical presentations of the two individual components. The immunomodulatory potential of Agastya Haritaki should be taken as a potential field of investigation and might also prompt other researchers to study the two individual components under the same conditions in the same work, in order to evidence the physiological extent of evolution compared to the data and the Ayurvedic knowledge presented in this work.

5.2. In Vivo Studies

In vivo studies are highly valuable as they provide a comprehensive view of the actual immunomodulatory properties of the herb and its beneficial effects in live organisms. Agastya Haritaki was found to be more effective than the placebo in various clinical trials, improving lung health, immune function, and other relevant parameters. Different animal studies have confirmed such therapeutic benefits and explained the mechanisms of action discussed above. In comparison, the in vitro studies engaged isolated cells and may correspondingly lack such physiological relevancy. Therefore, it is highly recommended to explore the in vivo effects of Agastya Haritaki in depth. The extract of abundant phytochemicals was found to more effectively increase the phagocytic activity of chicken macrophages compared to the herbal extract that exclusively contains gallic acid. In a clinical trial on preschool children, Agastya Haritaki showed statistically significant improvements in four out of six domains compared to the control group, suggesting a strong therapeutic potential. Another recent in vivo study evaluated the immunomodulatory effects of Agastya Haritaki extract in parrot fishes infected with *Aeromonas hydrophilia*. It was observed that all cellular parameters of both innate and adaptive immunity

showed a significant increase when compared to that of the pre-exposed fermentation product. Overall, sub-acute exposures to the prepared formulation of Agastya Haritaki showed more beneficial immunostimulatory effects in parrot fishes when compared to the control and pre-exposed post-vaccinated groups. These studies clearly demonstrate the need to further investigate the therapeutic potential of Agastya Haritaki in clinical trials as well as on the entire.

6. SAFETY AND TOXICITY PROFILE

In Ayurveda, herbs, mineral medicines, and herbo-mineral formulations are widely used. They were stated to have excellent potential when properly prepared. One such herbo-mineral formulation is Agastya Haritaki. Since it contains heavy metals, the safety of such formulations should always be checked, and there is a need for its safety evaluation. In India, a significant portion of the population seeks out Ayurveda physicians for chronic diseases, and Agastya Haritaki helps prevent infections. Typically, if a medicinal product has been used by the general public as part of conventional medicine, the evidence of long-term use is considered to be of sufficient quality to confirm this product's safety. In earlier times, the safety was regarded as positive by local people in many rural communities, and these formulations are used daily by ancient scholars. Various ancient texts mentioned some of the contraindications. The safest dosage for medicinal preparation was stated in these texts. In addition, several researchers have conducted toxicity studies on human cells, as well as on all aspects of a preclinical investigation. Today, the Agastya Haritaki herb is currently used around the world. Some people have no faith in traditional treatments, and there have been recommendations that these herbs should all be tested for their safety due to potential contamination. In earlier times and in many societies, these medications were safely used in higher doses by treating physicians. The compounds obtained through ancient medications are also being considered for drug development and donation programs.

6.1. Traditional Usage and Safety

Agastya Haritaki, a polyherbal formulation, has been used safely for ages in Ayurveda practices. The ancient Vedic literature states that Haritaki processed with 'Agastya decoction' is a classical formulation

and one of the main drug compositions in Agastya Haritaki yoga. Some notable Nighantus also mention the substitute plants used for Agasthi as Agastya Haritaki, which indirectly indicates the importance and regular use of Agastya Haritaki. It attests not only to its use during the preparation of Agastya Haritaki but also to its stand-alone references under therapeutic formulations.

Ayurveda, while improving immunity, is also equally particular about safety regarding the types of drugs along with their dosage forms, indications, and contraindications, to ensure the usage of particular drugs in a safe manner. In the section of Apatarpana Chikitsa, there is also a reference to Agastya Haritaki in the form of tested experience. A single dosage form, as well as various dosage forms of Agastya Haritaki, is well described with indications in the literature. A special diet and type of preparation of Agastya Haritaki, its continuous use along with different Anupana and dietary restrictions, have been mentioned for preventing tuberculosis. Up to six months, this drug has been mentioned to be safely used for preventing Kshaya. Clinical practice of Agastya Haritaki formulations in identifying the most deadly diseases for a long time shows that it is a safe drug de novo. Thus, in this context, it can be concluded that Agastya Haritaki has been well accepted as safe. Agastya Haritaki is not primarily a main drug delivery tool but is used to avoid excess dosage. It can be considered a guarantee with the available knowledge of Ayurveda. Although clinical data are yet to be demonstrated, it proves the point that whether acute, chronic, or sub-acute toxicological studies of Agastya Haritaki shall be done showing safety. Configuring according to dosage reduction, as mentioned in Agastya Haritaki, symptoms of adverse effects will be prevented based on manasika and possible Dushivisha. Ayurveda views have proven effective in dealing with chronic and psychosomatic diseases, but results shall be cut down as per Rasa due to Agastya Haritaki. To avoid acute and sub-acute drugs that have been proven, neither studying the chronic oppresses for Agastya Haritaki is advisable. According to the psychosomatic science of Ayurveda and its modulation, suppressive aspects as well as pathya granted on an individual basis, it can be the next regimen to continue this and should be studied from the angle to validate the combination in different terminology. The kit system is based on the judgment of modern in-depth and metabolite studies. Drug status should be studied on Agastya Haritaki itself.

7. FUTURE PERSPECTIVES AND POTENTIAL DIRECTIONS

The review of literature demonstrates a lacuna of knowledge concerning Agastya Haritaki and a definitive gap in the literature in terms of potential scientific discussions for this herb, which may contribute toward its inclusion in the integrative health approaches of Ayurveda. Much detailed research is therefore needed to understand the complete identification of the constituents of this polyherbal formulation and to establish its molecular basis of therapeutic effects. The mode of action of the ingredient materials used in the preparation of Agastya Haritaki to date is not completely understood. Furthermore, clinical evaluations are also in the nascent stage, and no internationally standardized clinical trial data exist in the context of therapeutic findings for Agastya Haritaki. Detailed investigations are needed on this front to further validate Agastya Haritaki and make stronger arguments to support its clinical utility and application, with more widespread acceptance and scientific respect in the field of Ayurveda. Scientific communities should come together and propose interdisciplinary panels for this purpose in the future. It is important that Ayurveda treatments also go hand in hand with modern medicine and serve as an integrated base for therapy. This research all the more emphasizes the potential of Agastya Haritaki for today's medical needs and the future generation's approach to comprehensive patient care. In the context of Ayurveda, many areas related to Agastya Haritaki remain unexplored, prompting the need for scholars focused on Ayurveda research to take this call to action and investigate the unexplored areas of Agastya Haritaki. There is also a need for medical practitioners to evaluate these research areas so that Agastya Haritaki may be validated as a complementary addition in the areas of interventional medicine for chronic diseases, as a nutritional supplement, and also for the treatment of various immune deficiencies. Scientific researchers worldwide are advised to describe critical, comprehensive, detailed viewpoints in research grant applications, thereby attracting funding and galvanizing investigators of Agastya Haritaki.

7.1. Integration with Modern Medicine

The extent of integration with modern conventional medicine practices, including its acceptability, challenges, and ongoing scientific resolution, should

be aligned with the pattern and requirements of patient care for better benefits. Agastya Haritaki can be integrated with modern medicine at the levels of:

1. Trial or synergistic approach.
2. Complementary trial for better action.
3. Utilized in chronic degenerative disorders or autoimmune disorders to control morbidity due to long-term toxic medication.

However, this issue of integration with the modern scientific approach has a different angle towards philosophy, social morality, ethics, and experimental designs. The major barrier between Ayurveda and modern scientific disciplines is the basic philosophy and fundamental principles on which these are based. Ayurveda is nature-oriented rather than disease-oriented, whereas Western medical philosophy is more disease-oriented with a materialistic approach of Drug-Target, Disease-Gene, and Gene-Protein. To bridge the gap between these two different philosophies, there should be integration of pharmacotherapeutic drugs, scientific models, and therapeutic targets with a personalized vision of human health. Agastya Haritaki, being included in a multidisciplinary health care course, has the potential to cater to the symptoms as well as the root cause in a holistic approach. Modern medicine supports a diet chart with Agastya Haritaki for COPD, asthma, allergic asthma, or allergic rhinitis, non-specific injection with Virechana in the control of non-remission disease status, allergic dermatitis, and psoriasis. In psoriasis, compatible drugs are coenzyme Q-10, omega-3 fatty acid, curcumin, resveratrol, cessation of smoking and alcohol, chemoprotective agents, Agastya Haritaki, etc. Agastya Haritaki is also indicated for its prophylactic effects: 1. Agastya Haritaki promotes appetite, which in turn will promote immunity by increasing the nutritional requirement and proportionate digestion, assimilation, and metabolism. 2. It is primarily an insult against the common cold and flu.

There are several clinical aspects and reports of Agastya Haritaki, where at least the following various diseases have been cured or treated with Agastya Haritaki. Hence, Agastya Haritaki definitely plays a better role in the management and promotion of remission of various mucosal, respiratory, and other immuno-related diseases and may also carry prophylactic effects. This multi-drug conservative approach in management requires proper optimized dosage forms for combined drugs, considering bioavailability factors, maximum therapeutic dose, MTD conversion, and safety profiles of drugs. As an

immunomodulator, Agastya Haritaki works with its properties like immunostimulatory and antihistaminic effects.

The following situation reports demonstrate the practical effects of Agastya Haritaki in various chronic diseases during and post-treatment services. The practical approach will explain the role of Agastya Haritaki in the promotion of remission, vasoregulatory anti-inflammatory, anti-stress, psychosomatic mucosal remodelling, as well as prophylactic effects as an adjuvant therapy in various diseases with modern and Ayurveda-related complaints reported by patients. Along with this aspect, how Agastya Haritaki performs from co-diet and varied vasoregulatory, immuno-related therapy for modern health care and services. From these pragmatic scenarios, the role of adjuvant therapy or supportive therapy or remission preference of Agastya Haritaki has been described. Because of these clinical effect situations, certain diseases or the requirement of promotive and prophylactic therapy have been clearly described. It also provides a suggestion for the acceptance of Agastya Haritaki-based therapies, including the methodology and the need for immunomodulatory validation and cosmeceutical product evidence-based health services.

8. CONCLUSION

The present review aims to encapsulate the complete knowledge existing about Agastya Haritaki and its therapeutic uses in the Ayurvedic system. As per Ayurveda, Agastya Haritaki is a potential herb for immunomodulation as well as immunosuppression. The review enlists the phytochemicals discovered from the herb and the mechanisms of action of the herb. It portrays the roles of Agastya Haritaki as a potent antioxidant, anti-inflammatory, anticancer, anti-allergy, antiasthmatic, and many more health benefits. In conclusion, it can be said that Ayurveda is the oldest system of medicine, and day by day, many herbs are being utilized in contemporary health practice. Agastya Haritaki bears great potential in the field of immunomodulation and is a member of many classical Ayurvedic preparations. In recent years, extensive preclinical research has been carried out, which confirms the traditional uses of Agastya Haritaki. There are reports that Agastya Haritaki holds anti-inflammatory, anti-allergy, antiasthmatic, antiviral, antimicrobial, hepatoprotective,

radioprotective, adaptogenic, and thalassemic activity. With such great potential, there is a need to conduct multicentric clinical trials on clinical disorders based on the properties Agastya Haritaki possesses. Normalization of increased pro-inflammatory cytokines in various diseases by Agastya Haritaki should be explored. The phytochemical composition and the mechanisms of action of all the reported biological activities should be explored for a better understanding and insights about Agastya Haritaki. It should thus be accepted and integrated with contemporary medicine. In the end, a spirit of cooperation is to be developed in Ayurveda and modern medicine by sharing the effects of Agastya Haritaki on immunity and inspiring young researchers to work on this potential herb for the protection and rejuvenation of all humans. 123456789

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