



Review Article

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HARITAKI PATHYANAM: A CRITICAL REVIEW

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ABSTRACT

Health is wealth. Everybody wants a healthy life, but it is challenging to maintain a healthy life in the present era due to faulty diet habits and lifestyles. A drug is mentioned in Ayurveda designated as Mata (mother) as beneficial to health to fulfil this purpose. In the absence of a mother or when a person becomes independent to live, even in the mother's absence, Haritaki (*Terminalia chebula* Ritz) is sufficient to care for or maintain physical-psychological equilibrium. It has a broad spectrum of pharmacological activities associated with the biologically active compound. This drug belongs to the family Combretaceae, used extensively in the Indian system of medicine like Ayurveda, Unani, Siddha, Tibetan and Homeopathy. Fruit is the main helpful part, named with several Sanskrit names like Abhaya, Amruta, Shiva, Pathya, Shreyasi, Kayastha and called Chebulic myrobalan in English. The detailed description of the plant, its seven varieties of fruit, medicinal uses as a single drug and in combination with different adjuvants in respect to the allotted seasons, different doses forms, various diseases condition, pharmacodynamic properties and systemic pharmacological actions, therapeutic uses, side effects and contraindications mentioned in classics are gathered here in this review article to highlight the multifaceted use and important use of this noble drug.

Keywords: Haritaki, *Terminalia chebula*, Ritucharya, Season.

INTRODUCTION

The principle of Ayurveda science is to maintain a healthy person's health and cure the disease of the diseased person. For this, it has been mentioned to follow the daily regimen strictly. One person can suffer from disease even after strictly following the daily regimen mentioned in the classics, as the human system is continuously exposed to climatic fluctuation. To protect the non-linear human system from all these Doshic fluctuations, there is a protocol to consume Haritaki with respective adjuvant in different seasons. The body will have minimum morbid factors and attain rejuvenating properties ¹⁻³. The plant *Terminalia chebula* Retz. Belong to the family Combretaceae, commonly known as chebulic myrobalan in English⁴. This drug is natural and native to South Asia, mainly India, Sri Lanka, Nepal, China, etc. It is extensively used in Ayurveda, Unani, Siddha, Tibetan and Homeopathy medicine. Fruit is helpful in a wide range of clinical conditions due to broad-spectrum pharmacological activities, biologically potent and active chemicals. The major active phytochemicals are glycosides, tannin, terpenes, flavonoids, alkaloids, anthraquinones, anthocyanin, polyphenolic compounds, chebulinic acid, chebulagic acid etc. are responsible for the therapeutic effects and beneficial to human. It detoxifies and balances the bodily humour throughout the year. PATHA means channels of the human system. Unless and until Imbalanced Dosha will not be blocked or obstructed in channels, the disease will not be settled, or body tissue never loses its resilience. 365 days of Haritaki application maintain the channelization and tissue resilience; hence, the fluctuation of Doshas could be /turbulence could be, but the disease could not be settled. Therefore, it is rightly said haritakli pathyanam. To

propagate or popularize this concept of Ayurveda, pharmacological, experimental, toxicological and phytochemical information about Haritaki has tried to review here critically.

Synonyms

Various synonyms are available in classics like- Abhaya, Amruta, Shiva, Pathya, Shreyasi and Kayastha etc., based on their distribution, qualities, medicinal uses, etc⁴.

Varieties Mentioned in Ayurveda

There are seven types of Haritaki described in Bhavaprakash Nighantu (Lexicon) according to distribution, geographical and climatic conditions^{5,6}. Even the shape, size, morphology of plants and fruits are different, but all seven varieties are originated from single species *Terminalia chebula* Retz. These are found in other geographical locations and individually indicated for a specific therapeutic effect. Vijaya Variety resembles the shape of Alabu (bottle Guard) and is valuable in all diseases available in the Vindhya Mountain area. It is considered as best among all varieties.

Rohini variety is round in shape, useful in wound healing, available in Pratishtanaka Jhansi and other parts of Madhya Pradesh. Putana variety has small fruits with big seeds used for external application as poultice available in the Sindh area. Amruta have thick fruit pulp useful in Panchakarma (detoxification procedure) and is available in Champa, Bhagalpur area,

Abhaya has five ridges on fruit, useful in eye diseases available in the Champa area. Jeevanti variety has Golden yellow colour valuable fruit in all conditions, available in Saurashtra region of Gujarat. The Chetaki variety has three ridges on the fruit, which is helpful for purgation and is available in Himachal Pradesh, India.

Chemical Composition

Several chemicals have been isolated from *Terminalia chebula*, including the triterpenes arjunglucoside I, arjungenin, and chebulosides I and II. tannins, anthraquinones, chebulinic acid, chebulagic acid, chebulic acid, ellagic acid and gallic acid. Phenolic compounds in ripe fruits include ellagic acid, 2,4 chebulyl-β-D-glucopyranose, chebulinic acid, gallic acid, ethyl gallate, punicalagin, terflavin A, terchebin, luteolin, tannic acid and Chebulic acid. Luteic acid can be isolated from the bark. The fruit of *T. chebula* also contains terflavin B, a type of tannin⁷⁻¹³.

Special properties in various doses form

- If chewed, it enhances appetite, increases digestion power.
- If it is taken in powder form orally, it cleanses the bowel.
- If taken after boiling or after steaming, it becomes absorbent and beneficial in malabsorption syndrome like Sprue.
- Fried Haritaki pacifies Tridoshas and brings them to a balanced condition.
- Haritaki takes with the meal, beneficial in intellectual promoting and better perception of a sense organ.
- If taken after a meal, it cures diseases due to wrong dietary habits and eliminates all toxic effects of food poisoning and Tridosha imbalance. If taken with Rock salt, it helps to balance Kapha Dosha. It balances Pitta Dosha be taken with sugar and by Ghee subside Vata disorders. With Jaggery, it is beneficial in all diseases.

Pharmacodynamics and Uses

Haritaki has five Rasas (taste) except Lavana Rasa (Salt).

These tastes are present in various parts of fruits the seed kernel is sweet, the pulp is sour, the skin (epicarp) is pungent, the fruit rind is bitter, and the seed is astringent in general; it is dominant of astringent Rasa. Quality is Laghu(light), Rukshya (dry), Veerya (potency) is, Ushna(hot), Vipaka is sweet. It pacifies vitiation of Tridoshas by sweet, bitter and astringent taste. It balances Pitta due to pungent, bitter, astringent. Kapha-Pungent, bitter and astringent taste. Subside Vata- Sweet and sour.

Externally Haritaki is applied to inflammation, conjunctivitis, skin diseases like erysipelas, improved skin complexion. The decoction is used for cleansing wounds, gargling oral and throat diseases. It helps normalise bowel movement, useful in loss of appetite, vomiting, pain in the abdomen, early stage of ascites, haemorrhoids, hepatomegaly and parasite infestation. Haritaki powder with grapes helps relieve hyperacidity, is helpful in splenomegaly, weakness in the heart, Vtarakta (gout) and other disorders of blood cures anaemia, and is useful in jaundice and oedema. Rhinitis, cough, hoarseness of voice, hiccough, dyspnoea, wheezing, breathing difficulty are relieved by Haritaki as it reduces congestion. It is also useful in spermaturia, leucorrhoea and acts as a uterine tonic. Useful in headache, dysuria, urine retention, calculus, urinary tract disorder, diabetes, weakness of nerves and brain, and Vatik disorder diminish vision and improve intelligence. It acts as anti-ageing, rejuvenating, nourishing and enhancing immunity. Improve body weight, improve life expectancy by maintaining healthiness¹⁴.

Haritaki has pharmacological activities like antioxidant free radical scavenging activities¹⁵⁻²², anti-mutagenic²³⁻²⁵, reproductive and chemotherapeutic anti-carcinogenic activity²⁶⁻²⁷, hepatoprotective activity²⁸⁻³⁰, antidiabetic and nephroprotective activity³¹⁻³², cardioprotective activity³⁴⁻³⁵, antibacterial activity³⁶⁻⁴⁷, cytoprotective activity⁴⁸⁻⁵¹, antifungal activity⁵²⁻⁵⁵, anti-allergic activity⁵⁶⁻⁵⁸, antiviral activity⁵⁹⁻⁶⁶, antiprotozoal activity⁶⁷⁻⁷¹, adaptogenic and anti-anaphylactic activity⁷²⁻⁷³, hypolipidemic activity⁷⁴⁻⁷⁵, wound healing⁷⁶, gastrointestinal motility improving⁷⁷⁻⁷⁹, immune modulatory activity⁸⁰, antispasmodic⁸¹ anti caries⁸², and purgative activity⁸³.

Contraindication of Haritaki

Haritaki have been several health benefits and extensive uses in the formulation of various diseases. It takes care of a mother who cares about her child with all disease aspects. But due to its astringent and hot nature, it is contraindicated in some clinical conditions. So it should be avoided in tired people because of walking long distances by other physical exertion, who have depleted immunity and strength, who are physically dry and bony, have lean bodies, fast for a long time, in case of people with increased Pitta/burning sensation, in pregnant women, person after bloodletting, during or soon after menstruation, who are having severe thirst and hunger, have a history of lengthy-standing sunlight exposition, suffering of prolonged standing indigestion or intake of dry and spice food, those who are emaciated due to excessive sexual activity and alcohol consumption, intake of poison, in people with neck stiffness, dry throat, early stage of fever etc.

Haritaki has significantly less nutritional value but more action like cleansing, moisture absorption, weight reduction. All the conditions mentioned as contraindicated have mostly dryness-like symptoms, so further administration of astringent drugs like Haritaki might help precipitate the dryness again. So it is avoided in pregnancy, infant, child up to 5 years of age. Due to the astringent action, it dries up and hampers milk production in lactating mothers; so, single drug use of Haritaki is contraindicated in lactating mothers and males of a young age due to Shukra Shosaka (hampering spermatogenesis action).

Ritu Haritaki

To attain the Rasayana Karma (vitalizing action, Rejuvenation, anti-ageing effect), Haritaki is taken along with different adjuvants in a different season with a dose of 2-4 gm powder Ritu Haritaki.

These are like the Rainy season(Varsha Ritu) - It is administered with Saindhava Lavana (rock salt)

In Autumn (Sharad Ritu) – with Sharkara(Sugar)

Early winter (Hemanta Ritu) Shunthi (Dry ginger)

Winter (Shishira Ritu) – Pippali (long pepper)

Spring (Vasanta Ritu) - Madhu(Honey)

Summer (Grishma Ritu) - Jaggery

It causes the natural detoxification of bodily toxic materials.

Effect of Haritaki with Pippali on Dosha, Agni and Bala in Shishira Ritu (Winter Season): In Shishira Ritu environment becomes cold and dry due to clouds, winds and rains. The person's strength remains high, and Digestion capacity remains in a powerful state. Usually, during this season, Kapha Dosha accumulation takes place. Ritu Haritaki should be taken with Pippali (Long Pepper). Both Haritaki and Pippali are Ushna (Hot) in potency; hence they pacify Kapha, whereas Snigdha Guna(Unctuous property) of Pippali pacifies Vata. Both drugs have rejuvenation properties and are helpful for the longevity of life, maintenance of health in healthy persons and gives strength

to the body as well as increase intellectual power and memory, help to cure a common cold, Flu, Bronchitis, strep throat and Coronavirus etc. occurs commonly in Shishira Ritu. With Kapha dominancy, these diseases are also known as Urdhwajatrugata Vyadhis (Diseases of the supra-clavicular region). Classically both are indicated in Kasa (cough), Tamaka Shwasa (Asthma), Kapha Praseka (Expectorant), Chardi (vomiting), Hikka (Hiccough), Ajirna (indigestion), Pandu (Anaemia), Krumi Roga (worm infestation) due to digestive system stimulating properties. Both help brings Pitta Dosha into an equilibrium state and maintains body equilibrium by Rasayana Karma.

Effect of Haritaki with Madhu on Dosha, Agni and Bala in Vasanta Ritu(Spring Season): Flowering, the appearance of new leaves, germination of seeds are the overall rejuvenation of Nature commonly observed in Vasant Ritu, which bring a pleasant and calm environment. During this season, diminution of digestion capacity occurs due to liquefaction of Kapha Dosha, which was accumulated in Hemant Ritu by intense sun rays. The body strength is medium in Vasant Ritu.

Haritaki should be taken with Madhu (Honey). Madhu has Lekhana (scraping), Grahi (absorbent), Deepana (digestive stimulant), Vrana Ropana (wound healing), Rochana (appetizer). Haritaki is Laghu (light to digest), Ruksha (drying action), Ushna(hot), Madhura Vipaka (anabolic), Rasayana and Anulomana (mild laxative). The combination of Haritaki and Honey controls the natural(seasonal) provocation and suppression of Doshas. It also prevents common diseases like Asthma, Rhinovirus, Flu, gastroenteritis and strep throat and allergic conjunctivitis, which commonly occurs in Vasanta Ritu. Madhu can enter into minute channels, clears them, and increases the potency of another drug in a combination.

Effect of Haritaki with Guda on Dosha, Agni and Bala in Grishma Ritu(Summer Season): Grishma Ritu is very hot and has dry weather due to penetrating, and intense sun rays, which evaporate the moisture of the earth and the strength of the person becomes very low. During this season, Pitta Dosha increases and environmental heat diminishes digestion capacity. Dehydration, Heat Stroke, Chickenpox, Mumps, Measles, Diarrhoea, Typhoid, and Sunburn are the common diseases found in Grishma Ritu.

Haritaki should be taken with Guda (old Jaggery). It pacifies Pitta and Vata, increases digestive fire, does not block the channels, Rakta Prasadak (blood purifier), Mutra Shodhaka (corrects urine abnormally), and balances Kapha Dosha.

Effect of Haritaki with Saindhav Lavana on Dosha, Agni, Bala in Varsha Ritu(Rainy Season): In Varsha, Ritu's digestion capacity is already in a low state; increased acidity in rainwater and water vapour from the earth's surface precipitate the pathology towards the aggravation of Tridosha. People are instructed to follow general recommended diet and regimens. To maintain the equilibrium of Doshas, Haritaki should be taken with Saindhav Lavana (Rock Salt).

Diseases like influenza, cholera, typhoid, hepatitis A, dengue, and malaria commonly occur during this season due to contaminated water. Haritaki and Saindhav Lavana have Tridosha pacifying properties. Haritaki is Kapha Pitta Shamaka (nullify) because of the taste of Madhura (sweet), Tikta (bitter), and Kashaya (Astringent), which balances the Vata due to its Amla (sour) taste, not increasing Vata and Pitta Doshas by its pungent and sour, due to salty taste of Saindhava it pacifies Vata Dosha and chest congestion. In contrast, it subsides Pitta Dosha independently due to its cold potency. Therefore it is a perfect combination for the rainy season.

Effect of Haritaki with Sharkara on Dosha, Agni and Bala in Sharad Ritu(Autumn Season): The body is habitual to rain and the cold environment of the rainy season; when suddenly exposed to the sun rays of Sharad Ritu causes the aggravation of Pitta Dosha. The temperature and humidity become extreme in the environment. The rise of the Agastya star makes the water of lakes; rivers are pure and intoxicated. The strength of the body and digestion power is medium.

Haritaki should be preferred to apply with Sharkara. Haritaki pacifies Piita by its Madhura, Tikta and Kashaya taste; Sharkara pacifies Pitta Dosha due to its cold potency and Madhura taste. It also cures Allergies, Skin disorders, Burning sensation, Sore throat, Acute ear infection, Common cold, Flu etc. which are commonly manifest in Sharad Ritu.

Haritaki is indicated in Kasa, Tamaka Shwasa, mainly in Kaphaja disorders, and Sharkari is indicated in Pitta dominant disorders like Daha, Raktagata Vikara.

Their combination helps mitigate abnormal Vata due to Snigdha Guna, Madhura Rasa and Madhura Vipaka.

Effect of Haritaki with Sunthi (Dry Ginger) on Dosha, Agni, Bala in Hemant Ritu(Early winter): With the cold winds of Hemanta Ritu, cold weather increases digestion capacity by increasing its resistance to climatic conditions. People should take a heavy, rich and nourished diet in more quantities like Cow Milk and its products, sugarcane, etc. If people do not follow the plump and nourished diet, then digestion power affects the body and utilises body tissues as their food, aggravating Vata Dosha.

Haritaki should be taken with Sunthi. Both are hot in potency and have a sweet taste, which helps balance the Vata Dosha. Common cold, Sore throat, Arthritis, dry and cracking skin, Asthma, Bronchitis, Migraine, pain in joints are the commonly occurring diseases of Hemanta Ritu. This combination is beneficial in Kaphaja and Vataja disorders of the properties Laghu, Ushna and Ruksha. It helps bring the Pitta back to an equilibrium state by its Madhura Vipaka; due to hot potency, it stimulates metabolism, which gets impaired due to vitiation of Pitta.

This Ayurvedic herb is extolled for its effect as Rasayana Therapy. The seasonal use of Haritaki can be one of the cheapest and most effective tools to maintain health, detoxify the body, and keep it free from diseases. It is even good in co-morbid conditions like overweight, Diabetes, Hypertension, increased lipids and cholesterol in the blood and other degenerative disorders due to improper nutrition characterised by overeating, eating a lot of oily and fried food, not doing exercise, taking junk food etc.

It does the Shodhana (purification)/activation of Doshas. It brings the impaired digestion capacity to its equilibrium state and maintains bodily humours by detoxifying and balancing them throughout the year.

CONCLUSION

Everyone wants a healthy life, but it's hard to maintain a healthy life in the present era due to faulty diet habits and lifestyles. There are many methods in Ayurveda to regulate the nutritional status of life like Dinacharya, Ritucharya, Sadvrutta, Achar Rasayana etc. Ritu Haritaki is one of them. It is said that "As is the grain, so is the mind". Haritaki produces the wholesome effect of "Haritaki Pathyanam". It is recommended with different adjuvants in different seasons like Pippali, Jaggery, dried ginger, etc. It modifies and enhances the strength and qualities of the

principal ingredient, i.e. Haritaki. Ritu Haritaki acts as preventive, curative, and Rejuvenative medicine.

REFERENCES

- Charaka Samhita, Chikitsa Sthana, Adhyaya, 16: 8-10, 2nd edition, Chaukhamba Sanskrit Sansthan Varanasi, 2009
- Sushruta; Sushruta Samhita Illustrated by Kaviraj Ambikadatta Shastri, Chaukhambha Sanskrit Sansthan Varanasi, 15th edition, Sutra sthana Chapter15/15,2007. P 63
- Vagbhata, Ashtanga Hridaya, Sarvangasundara commentary of Arunadatta and Ayurveda Rasayana of Hemadri, 5:13, Chaukhamba Sanskrit Sansthan, Varanasi 201
- Chunekar KC, Pandey GS, editors. Varanasi: Chaukhamba Bharati Academy; 1999. Bhavaprakasha Nighantu; pp. 4–5. [Google Scholar]
- Bapalal Vaidya. I Edn. 1968. Nighantu Adarsa; Chaukhambha Vidyabhavan; p. 551–4.
- Haritakyadi Varga, Bhava Prakash Nighantu by Bhava Mishra, published by Chaukhambha Bharati Academy, Varanasi.
- Gupta AK, Tandon N, Sharma M. Quality standards of Indian medicinal plant. New Delhi: Indian Council of Medical Research; 2003:207-209.
- Khare CP. Indian medicinal plants: An illustrated dictionary. Berlin: Springer-Verlag; 2007. p. 652-653.
- Govt. of India. The Ayurvedic Pharmacopoeia of India. New Delhi: Government of India Ministry of Health and Family Welfare Department of Indian System of Medicine and Homoeopathy; 2001. p. 47.
- Aslokar LV, Kakkar KK, Chakre OJ. New Delhi: Publications and Information's Directorate, CSIR; 1992. Glossary of Indian medicinal plants with active principles
- Sukhdev SH, Deepak M, Joseph GVR, Joseph S, Nagar G. Indian herbal pharmacopoeia. Vol II. Jammu Tawi: IDM, Mumbai and RRL, CSIR; 1999. p. 154-159.
- Kumar A, Lakshman K, Jayaveera K, Satish K, Tripathi SM. Estimation of rutin and quercetin *Terminalia chebula* by HPLC. Int. J AesthAntiag Med. 2009; 2 (1):3.
- Jayaramkumar K. Effect of geographical variation on tannic acid, gallic acid, chebulinic acid, and ethyl gallate in *Terminalia chebula* fruits. Nat Prod. 2006; 2 (3-4):170-175.
- Shastry JL. Varanasi: Chaukhamba Orientalia; 2005. Dravyaguna vijnan, Vol 2. P 209–215.
- Mahesh R, Bhuvana S, Begum VM. Effect of *Terminalia chebula* aqueous extract on oxidative stress and antioxidant status in the liver and kidney of young and aged rats. Cell Biochem Funct. 2009; 27 (6):358-363.
- Chang CL, Lin CS. Development of antioxidant activity and pattern recognition of *Terminalia chebula* Retzius extracts and its fermented products. HungKuang J. 2010; 61:115-129.
- Chen X, Sun F, Ma L, Wang J, Qin H. Du G. In vitro evaluation. on the antioxidant capacity of trichylchebulate, an aglycone from *Terminalia chebula* Retz fruit. Indian J Pharmacol. 2011; 43 (3):320-323.
- Hazra B, Sarkar R, Biswas S, Mandal N. Comparative study of the antioxidant and reactive oxygen species scavenging properties in the extracts of the fruits of *Terminalia chebula*, *Terminalia bellerica* and *Emblica officinalis*. BMC Comp Alter Med. 2010; 10:20.
- Naik GH, Priyadarsini KI, Naik DB, Gangabagirathi R, Mohan H. Studies on the aqueous extract of *Terminalia chebula* as a potent antioxidant and a probable radioprotector. Phytomedicine.2004; 11 (6): 530-538.
- Lee HS, Won NH, Kim KH, Lee H, Jun W, Lee KW. Antioxidant effects of aqueous extract of *Terminalia chebula* in vivo and in vitro. Biol Pharm Bull, 2005; 28 (9):1639-1644.
- Lee HS, Jung SH, Yun BS, Lee KW. Isolation of chebulic acid from *Terminalia chebula* Retz, and its antioxidant effect in isolated rat hepatocytes. Arch Toxicol. 2007; 81 (3): 211-218.
- Chang CL, Lin CS, Lai GH, Chen YH, Tuan WC, Hsu CM. Influence of *Terminalia chebula* extracts on the effect of PC12cell growth. J Trad Med. 2010; 21 (1):23-30.
- Saleem M, Hushum P. Harkonen K, Pihlaja Inhibition of cancer cell growth by crude extract and phenolics of *Terminalia chebula* fruit. J Ethnopharmacol. 2002; 81:327-336.
- Reddy DB, Reddy TC, Jyotsna G, Sharan S, Priya N, Lakshmipathi V, et al. Chebulagic acid, a COX-LOX dual 2 inhibitor isolated from the fruits of *Terminalia chebula* Retz, induces apoptosis in COLO-205 cell line. J Ethnopharmacol. 2009;124 (3):506-512.
- Grover IS, Bala S. Antimutagenic activity of *Terminalia chebula* (myroblan) in *Salmonella typhimurium*. Indian J Exp Biol. 1992; 30 (4):339-341.
- Gandhi NM, Nayar CKK. Radiation protection by *Terminalia chebula* some mechanistic aspects. Mol Cell Biochem. 2005; 277(1-2):43-48.
- Prasad I, Husain Khan T. Jahengir T. Sultana S. Chemomodulatory effect of *Terminalia chebula* against nickel chloride-induced oxidative stress and tumor promotion response in male Wistar rats. J Trace Elemn Med Biol. 2006; 20 (4):233- 239.
- Lee HS, Jung SH, Yun BS, Lee KW. Isolation of chebulic acid from *Terminalia chebula* Retz and its antioxidant effect in isolated rat hepatocytes. Arch Toxicol. 2007; 31 (3):211-218.
- Tasduq SS., Singh AK, Salti NK, Gupta DK, Suri K. *Terminalia chebula* fruits prevent liver toxicity caused by sub-chronic administration of refampicin, isoniazid and pyrazinamide (PZA)in combination. Hum Exp Toxicol. 2006; 25 (3):11-18.
- Tasaduq SA, Singh K. Sethi S, Sharma SC, Bedi KL, Singh J, et al. et al. Hepatocurative and antioxidant profile of HP-1, a polyherbal phytomedicine. Hum Exp Toxicol. 2003; 22 (12):639-645.
- Kannan VR, Rajasekar GS, Rajesh P. Balasubramanian V. Ramesh N, Solomon EK, et al. Anti-diabetic activity on ethanolic extracts of fruits of *Terminalia chebula* Retz. Alloxan induced diabetic rats. Am J Drug Discov Dev. 2012; 2:135-142.
- Senthilkumar GP, Subramanian SP. Biochemical studies on the effect of *Terminalia chebula* on the levels of glycoproteins in streptozotocin-induced- induced experimental diabetes in rats. J Appl Biomed.2008;6:105-115.
- Lee HS, Koo YC, Suh HJ, Kim KY, Lee KW Preventive effects of chebulic acid isolated from *Terminalia chebula* on advanced glycation end product-induced endothelial cell dysfunction. J Ethnopharmacol. 2010; 131 (3):567-574.
- Suchalatha S, Shyamadevi CS. Protective effect of *Terminalia chebula* against experimental myocardial injury induced by isoproterenol. Indian J Exp Biol. 2004; 42 (2): 174-178.
- Reddy VRC. Cardioprotective activity of the fruit of *Terminalia chebula*. Fitoterapia. 1990; 61:517-525.
- Minkyun NA, Wan BAE, Kang SS, Min BS, Yoo JK, Yuk OK, et al. Cytoprotective effect on oxidative stress and inhibitory effect on cellular aging of *Terminalia chebula* fruit. Phytother Res. 2004; 18: 737-741
- Bag A, Bhattacharyya SK. Pal NK. Chattopadhyay RR Synergistic effect of *Terminalia chebula* against multidrug-resistant uropathogenic *Escherichia coli*. Med Aromatic Plant Sci Biotech 2011;5(1):70-73.

38. R.Rathinamoorthy *et al.*, International Journal of Pharmaceutical Sciences and Nanotechnology. 2012;4(4)
39. Malckzadeh F, Ehsanifar H. Shahamat N, Levin M. Colwell RR Antibacterial activity of black myrobalan (*Terminalia chebula* Retz.) against *Helicobacter pylori*. Int J Antimicrob Agent. 2001 18 (1):85-88
40. Kim HG, Cho JH, Jeong EY, Lim JH, Lee SH, Lee HS. Growth inhibitory activity of active component from *Terminalia chebula* fruits against intestinal bacteria. J Food Prot 2006;69 (9):2205-2209.
41. Bonjar GH, Antibacterial screening of plants used in Iranian folkloric medicine. Fitoterapia 2004;75 (2):1231-235.
42. Aneja KR, Joshi B. Evaluation of antimicrobial properties of fruit extracts of *Terminalia chebula* against dental caries pathogens. Jundishapur J Microbiol, 2009; 2(3):105-111.
43. Kannan P. Ramadevi SR. Hopper W Antibacterial activity of *Terminalia chebula* fruit extract. Afr J Microbiol Res 2009; 3(4): 180-184.
44. Rani P, Khullar N. Antimicrobial evaluation of some medicinal plants for their antienteric potential against multi-drug resistant *Salmonella typhi*. Phytother Res. 2004;18(8):670-673.
45. Agrawal A, Gupta A, Choudhury NK, Wadhwa S, Dav K, Goyal S *et al.* Antibacterial activity of hydroalcoholic extract of *Terminalia chebula* Retz., on different Gram-positive and Gram-negative Bacteria. Int J Pharm Biol Arch. 2010;1 (4):485-488.
46. Kim HG, Cho JH, Jeong EY, Lim JH, Lee SH, Lee HS. Growth inhibitory activity of active component from *Terminalia chebula* fruits against intestinal bacteria. J Food Prot. 2006;69(9):2205-2209.
47. Bag A, Bhattacharyya SK, Bharati P, Pal NK, Chattopadhyay RR. Antibacterial activity of *Chebule myrobalan* (fruit of *Terminalia chebula* Retz) extracts against methicillin-resistant *Staphylococcus aureus* and trimethoprim-sulphamethoxazole resistant uropathogenic *Escherichia coli*. Afr J Plant Sci. 2009; 3(2): 25-29.
48. Na M, Bac M, Keng SS, Min BS, Yoo JK, Kamiryo Y. *et al.* Cytoprotective effect on oxidative stress and inhibitory effect on cellular aging of *Terminalia chebula* fruit. Phytother Res. 2004; 18 (9):737-741.
49. Murali YK, Ramesh Chandra, Murthy P.S, Antihyperglycemic Effect of water extract of dry fruits of *Terminalia Chebula* in experimental diabetes mellitus. Indian Journal of Clinical Biochemistry 19 (2):202-204.
50. Singh I, Singh PK, Bhansali S, Shafiq N, Malhotra S, Pandhi P, Pal S, Singh A. Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh City, India. Copyright (c) 2009 John Wiley and Sons, Ltd.
51. Gao H, Huang YN, Gao B, Kawabata J. Division of Applied Bioscience, Graduate School of Agriculture, Hokkaido University, Sapporo 060-8589, Japan.
52. Barazani VO, Sathiyamoorthy P. Shalev R. Vardy D, Golan GA Screening of South-Indian medicinal plants for antifungal activity, Phyther Res. 2003;17 (9): 1123-1125.
53. Dutta BK, Rahman I, Das TK Antifungal activity of Indian plant extracts. Mycuses. 1998;41 (11-12):535-536.
54. Mehmood Z. Ahmad I, Mohammad F. Ahmad S. Indian medicinal plants A potential source of anticandidal Drugs Pharm Biol. 1999;37 (3):237-242.
55. Bonjar GH. Inhibition of Clotrimazole-resistant *Candida albicans* by plants used in Iranian folkloric medicine. Fitoterapia 2004; 75 (1):74-76.
56. Khan KH, Jain SK. Regular intake of *Terminalia chebula* can reduce the risk of getting typhoid fever. Adv Biotech, 2009; (9):10-15.
57. Sato Y, Oketani II. Ningyoochi K, Ohibo T. Kibira M, Shibata H, *et al.* Extraction and purification of effective antimicrobial continues of *Terminalia chebula* Rete against methicillin-resistant *Staphylococcus aureus* Bull Pham Bull, 1997;2004: 401-404.
58. Jeong AHN, Kim CY. Lee JS, Kim Tg Kim ShLee CK *et al.* Inhibition of HIV-1 integrase by galloyl glucoses from *Terminalia chebula* and flavonol glycoside gallates from *Euphorbia pekinensis* Plant Med. 2002; 68:457-459.
59. Lee D, Boo K, Woo I, Duan F, Lee K. Kwun T. *et al.* Antibacterial and Antiviral activities of extracts from *Terminalia chebula* barks. J Korean Soc Appl Biol Chem. 2011; 54 (2):95.
60. Badmaev V. Niwakowski M Protection of epithelial cells against influenza A virus by plan derived biological response modifier Ledretan-96 Phytother Res. 2000; 44(4):245-249.
61. Gambari R, Lampronti L Inhibition of immunodeficiency type-1 virus (HIV-1) life cycle by medicinal plant extracts and plans derived compounds. Adv Phytamed 2006; 2:299-311.
62. Kurowa M. Nagasaka K, Hirabayashi T. Uyama S, Sato H Kogiyama T, *et al.* Efficacy of traditional herbal medicines in combination with acyclovir against Herpes Simplex Virus-1 infection *in vitro* and *in vivo*. Antiviral Res. 1995; 27 (1-2): 19 – 37.
63. Yukawa TA, Kurokawa M, Sato S, Yoshida Y. Kageyamer S, Hasegawa T, *et al.* Prophylactic treatment of Cytomegalovirus virus with traditional herbs Antiviral Res 1996;32 (2):63-70.
64. Venmani K, Garg S. Herbal medicines for sexually transmitted diseases and AIDS. J Ethnopharmacol. 2002; 80:49-66.
65. Ma H, Zhao YD, Li K. Kang T. A new alternative to treat swine influenza A virus infections: Extracts from *Terminalia chebula* Retz. Afr J Microbiol Res. 2010; 4 (6): 497-499.
66. Dwivedi S, Dwivedi A, Kapadia R, Kaul S. Anthelmintic activity of alcoholic and aqueous extract of fruits of *Terminalia chebula* Retz. Ethnobot Leaflets. 2008; 12:741-743.
67. Sohni YR, Kaimal P, Bhat RM. The anti-amoebic effect of crude drug formulation of herbal extracts against *Entamoeba histolytica* in vitro and in vivo. J Ethnopharmacol. 1995; 45 (1):43-52.
68. Bagavan A. Rahuman AI, Kamaraj C. Kaushik NK, Mohankrishnan D. Sahal D. Antiplasmodial activity of the botanical extract against *Plasmodium falciparum* Parasitol Res. 2011; 108(5):1099-1109.
69. Moeslinger T. Friedl R. Velf I, Brunner M, Koller E Spieckermann PG. Inhibition of inducible nitric oxide synthesis by the herbal preparation Padma 28 in macrophage cell line. Can J Physiol Pharmacol, 2000; 78 (11):861-866.
70. Nair V, Singh S, Gupta YK. Anti-arthritic and disease-modifying activity of *Terminalia chebula* Retz. In experimental models. J Pharm Pharmacol. 2010; 62 (12):1801-1806.
71. Pratibha N, Saxena VS, Amit A, D'Souza P. Bagchi M, Bagchi D. Anti-inflammatory activities of Aller-7, a novel polyherbal formulation for allergic rhinitis. Int J Tissue React, 2004; 26 (1-2):43-51.
72. Rege NN, Thatte UM, Dahanukar SA. Adaptogenic properties of six Rasayana herbs used in Ayurvedic medicines. Phytother Res.1999; 13:275-291.
73. Shin TY, Jeong HG, kim DK, Kim SH, Lee JK, Chae BS, *et al.* Inhibitory action of the water-soluble fraction of *Terminalia chebula* Retz. on systematic and local anaphylaxis. J Ethnopharmacol .2001; 74:133-140. [PubMed].
74. Maruthappan V. Shree KS. Hypolipidemic activity of Haritaki (*Terminalia chebula*) in atherogenic diet-induced hyperlipidaemic rats. J Adv Pharm Tech Res. 2010; 1:229-235.

75. Israni DA, Patel KV, Gandhi TR. The anti-hyperlipidemic activity of aqueous extract of *Terminalia chebula* and Gaumutra in high cholesterol diet-fed rats. Int J Pharm Sci. 2010; 1 (1): 48-59.
76. Li K, Diao Y, Zhang H, Wang S, Zhang Z, Yu B, et al. Tannin extracts from immature fruits of *Terminalia chebula* Retz promote cutaneous wound healing in rats. BMC Comp Alter Med. 2011; 11:1-9.
77. Sharma P, Prakash T, Kotresha D, Ansari MA, Sahrm UR, Kumar B, et al. Anti ulcerogenic activity of *Terminalia chebula* fruit in experimentally induced ulcer in rats. Pharm Biol. 2011; 49(3):262-268.
78. Nariya M, Shukla V, Jain S, Ravishankar B. Department of Pharmacology, L. M. College of Pharmacy, Gujarat University, Ahmedabad, India. Copyright (c) 2009 John Wiley and Sons, Ltd
79. Vani T, Rajani M, Sarkar S, Shishoo CJ. Antioxidant properties of Ayurvedic formulation Triphala and its constituents. Int J Pharmacog .1997; 35:313-317.
80. Aher VD. Immunomodulatory effect of alcoholic extract of *Terminalia chebula* Retz. ripe fruits, J Phar Sci Res.2010;2(9):539-544.
81. Seyyed AM, Ali V, Mohammad KGN, Peyman M. Spasmogenic activity of the seed of *Terminalia chebula* Retz. in rat, small intestine In vivo and in vitro studies. Malays J Med Sci. 2011;18(3):18-26.
82. Carounanidy U, Satyanarayanan R, Velmurugan A. Use of an aqueous extract of *Terminalia chebula* as an anticaries agent a clinical study, Indian J Dent Res. 2007;18 (4):152-156.
83. Tamhane MD, Thorate SP, Rege NN, Dahanukar SA. Effect of oral administration of *Terminalia chebula* on gastric emptying: An experimental study. J Postgrad Med. 1997; 43(1):12-13.

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