Chyawanaaprasha: An Ayurvedic wholesome healthy supplement

Dr.Ketan Rathwa*Dr. Rakesh Goyal**

Assistant professor*,Professor and HOD** Department of Rasa Shastra and Bhaishajya Kalpana at K. J. Institute of Ayurveda and Research, Savli. Vadodara.

1. Introduction

Chyawanaaprasha (CP) (also known as *chyavanaaprasha*, *chyavanaprash*, *chyavanaprasam*, and *chyawanaprash*) comprises two lexes, "*Chyawan*" and "*Prasha*". The word *Chyawan* is the name of a sage, and also symbolizes 'degenerative change'. *Prasha* denotes a drug or foodstuff that is suitable for consumption. Indeed, CP is a comprehensive 'metabolic' tonic; it contains a variety of herbs and is used to promote health and prevent diseases. *Chyawanaaprasha* is an ancient Indian formulation (a polyherbal jam), prepared according to a traditional Ayurvedic recipe, enriched with several herbs, herbal extracts, and processed minerals. Regarded by many experts as an essential health supplement, CP has been around for centuries. *Chyawanaaprasha* possesses multiple health benefits and has been widely used since ancient times as a health supplement and as a medicine for enhancing immunity and longevity. *Chyawanaaprasha* has been a part of every Indian's life from the day it was introduced, irrespective of sociocultural, political, and scientific factors. It was one of the most appreciated foods for its antiaging effects long before vitamins, minerals, and antioxidant supplements came into existence. [1]

Rasayana, a branch of Ayurveda, includes a number of specialized approaches aimed at prolonging life, preventing aging and diseases, eliminating degenerative processes, and promoting excellent health. Of all the *Rasayana* formulations enumerated during the classical and medieval periods, CP undoubtedly stands out as the most important. This formulation has made major strides as an over-the-counter product since it entered the consumer market in the 1950s. It is highly appreciated for possessing multiple health benefits and addressing the preventive, promotive, and curative aspects of health.

Chyawanaaprasha consists of *Amla*/*Amalaki* (*Phyllanthus emblica*/Indian gooseberry) pulp as a base, and this is considered to be the most effective *Rasayana* for sustaining homeostasis.[2]*Chyawanaaprasha* that contains *Amla* has a mixed taste, combining sweet, sour, bitter, pungent, and astringent qualities.[3] On regular intake, it maintains physiological functions and rejuvenates the whole body system.[4]

2. Origin

The atypical name of CP originates from the legend of *Chyawan Rishi*, who was a forest sage. Various ancient sacred treatises, such as the *Mahabharata*, the *Puranas*, etc., describe how the twin *Ashwini Kumar* brothers (the royal physicians to the Gods during the Vedic era) invented this polyherbal preparation to make the sage *Chyawan Rishi* younger and improve his vitality and strength. The formulation was prepared at his hermitage at Dhosi Hill near the Narnaul area, in the state of Haryana, India; drawing its name from the ancient sage, the formula was called "*Chyawanaaprasha*". He followed strict practices to become enlightened, and this had made him

weak, emaciated, and aged. To regain his youthfulness, vitality, and strength, he used CP.[5,6,7] The foremost historically recorded recipe for CP is reported in the *Charaka Samhita*, the ancient Ayurvedic classic, where it is appreciated as being superior to all other herbal rejuvenative tonics.[8]

3. Composition

Chyawanaaprasha is a potent antioxidant paste, prepared through the synergistic blending of around 50 herbs and spices. *Chyawanaaprasha* falls, by virtue of its consistency and form of dosage, under the category of *Awaleha* (electuaries/herbal jams), a group of Ayurvedic formulations.[9] Typically, CP includes four classes of herbal drugs: The *Dashmula* class (ten roots); [10]the *Chaturjata* class (four aromatic plants); *Ashtavarga* (threatened medicinal herbs from the Northwest Himalayas, which are not commercially available in the modern era); and a general class (materials not belonging to the former classes). The *Chyawanaaprasha* formula is described in the ancient Ayurvedic texts, namely, Ashtanga Hridayam, Charaka Samhita, Sarangadhara Samhita, which are dedicated to clinical management. The dominant ingredient is *Amla*, a citrus fruit that is a highly renowned and potent botanical in Ayurveda.Each ingredient of CP is scientifically validated for its nutritive and therapeutic efficacy. All these nutrients are blended in specific quantities and subjected to unique pharmaceutical processes in such a fashion that builds a potent synergy for optimal health virtues.[11,12]

4. Substitution of ingredients of *Chyawanaaprash*

The Government of India has already framed policies for the preservation, cultivation, and sustainable extraction of rare and endangered medicinal plants. Out of these, eight rare herbs that are ingredients of the “original” ancient recipe for CP are missing in commercial formulations of this traditional medicine. Commercial formulations now use substitute herbs. Among these eight, four belong to the orchid family, three are from the lily family, and one belongs to the house of gingers. These are conjointly called *Ashtavarga* and are said to augment the antioxidant role of *Amla*. Non-availability of authentic plants, confusion in vernacular names, and lack of chemical markers lead to substitution/adulteration of *Ashtavarga* plants.[13]

5. Phytochemical and Quality Specifications of *Chyawanaaprash*

Chyawanaaprasha is a semi-solid sticky paste with a brownish black appearance, chiefly having sweet and spicy odor, with a sweet and astringent feel after taste with aroma of *Prakshepadravya* (powder of seven herbs).[14,15]The taste is predominantly governed by the flavors of honey, cow ghee (clarified butter), and *Triphala* (a mixture of three myrobalans), and the aroma by cow ghee and certain spices viz. sandalwood, cinnamon, and cardamom. Limited studies are available on quality testing of CP. A major part in the composition of CP is *Amla*, which is rich in vitamin C and polyphenolics, including flavonoids.[16] The phenolic compounds of CP possess antioxidant principles that are said to contribute to the rejuvenating and tonic attributes of CP. A high-performance liquid chromatography (HPLC) analysis has identified several biologically active phenolics in CP, i.e., gallic acid, protocatechuic acid, catechin, caffeic acid, vanillic acid, chlorogenic acid, syringic acid, rutin, ferulic acid, and quercitrin, which may account for its therapeutic activity. By contrast, individual pharmaceutical companies have their own in-house specifications for the quality of CP, which are not in the public domain. The Ayurvedic Pharmacopoeia of India (API) has published a monograph on CP along with a brief

method of preparation and various physicochemical and assay tests as official quality standards. These include description, identification (such as microscopy, thin layer chromatography (TLC), physicochemical parameters (loss drying, total ash, acid-insoluble ash, alcohol-soluble extractive, water-soluble extractive, pH), assay, microbial limit, and test for aflatoxin. The Ayurvedic Pharmacopoeia of India mentions that CP should contain no less than 0.5% of gallic acid when assayed, based on the officially stated method.

6. *Chyawanaaprash*: A Nutraceutical and Functional Food

The term 'nutraceutical' was coined in 1989 by Stephen De Felice as "a food or part of a food that provides medical or health benefits, including the prevention and/or treatment of disease." *Chyawanaaprasha* has been a consistent part of Indian tradition both as a functional food and nutraceutical for the past 5000 years, with constant zeal and vivacity, and has survived owing to its peerless health benefits. *Chyawanaaprasha* is reported to have rich vitamin, protein, dietary fiber, energy contents, carbohydrate, low fat contents (no-*trans* and zero percent cholesterol), and appreciable levels of major and minor trace elements (mg/100g), such as Fe (21.1), Zn (3.1), Co (3.7), Cu (0.667), Ni (1.4), Pb (2.4), Mn (8.3), vitamin C (0.5), tannic acid (20.2), other vitamins A, E, B1, B2, and carotenoids that act as micronutrients for health-invigorating purposes. It also provides several essential phytoconstituents, namely, flavonoids, alkaloids, saponins, antioxidants, piperine, phenolic compounds, etc. The synergistic antioxidant effects of vitamin C along with vitamin E and carotenoids are well known. The rich nutritive composition and antioxidant biomolecules of CP act both singly as well as synergistically for immuno-modulation, body building, health restoration, and prevention of oxidative damage (a leading cause of several degenerative diseases).[17,18]

7. Health Benefits

7.1. Ancient Claims and Contemporary Scientific Evidence

Traditional Ayurveda practitioners call CP an "Ageless Wonder". The formula of CP is time-tested and is still effective to mitigate the present world's health concerns. In the context of CP, Charaka Samhita narrates: 'It is the premier *Rasayana*, beneficial for allaying cough, asthma and other respiratory ailments; it nourishes the weak and degenerating tissues, promotes vigour, vitality and is anti-ageing'. As per ancient classics, regular intake of this tonic helps to attain intellect, memory, immunity, freedom from disease, endurance, improved functioning of the senses, great sexual strength and stamina, improved digestive processes, improvised skin-tone and glow, and restores/maintains the normal biofunctions of *Vata* (bodily humor regulating all movements, circulations and neuroconductive actions).[19]

Chyawanaaprasha helps to balance the three *doshas—Vata*, *Pitta*, and *Kapha* (bodily humors/bioenergies regulating the structure and biofunctions of the human body). In the Ayurvedic perspective, the specific actions of herbs in CP in the micro and macronutrient supplement level, metabolic level, and tissue nourishment level are well recognized.[20] *Chyawanaaprasha* has passed the scrutiny of several scientific studies. Contemporary studies corroborate and validate the ancient claims and traditional beliefs regarding its therapeutic use. The herbal and spicy ingredients of CP help to convalesce the circulatory system, thus channelizing the removal of the toxins from distant tissues and visceral organs. It builds a congruent synergy amid physiological functions steering toward an improved metabolism. All

herbal and natural products in the composition of CP have been well investigated and explored by the scientific community for their therapeutic vistas. It is very challenging to uncover the active phytochemicals, the rationality behind its therapeutic usage, and the underlying mechanistic role of herbal medicine by adopting contemporary scientific tools and methods. However, this does not imply that all the doctrines or beliefs in traditional medical systems which are not justifiable by scientific substantiation are irrational and non-existent. It is aptly cited in Charaka Samhita, "What is perceptible to humans is merely a petite fraction of this cosmos and what we cannot observe is far more than that, which doesn't make that non-existent". *Chyawanaaprasha* is beneficial for health in several ways. It is an excellent ergogenic (enhancing physical performance), tonic, rejuvenator, anabolic, immunomodulator and promotes strength to the gastrointestinal tract, digestive organs, cardiovascular, respiratory, and cerebrospinal systems, neuronal circuits, and renal and reproductive tissues.[21]

7.2. Improves Digestion and Metabolism

*Chyawanaaprasha*helps to eliminate the accumulated excreta via improving digestion and excretion. It is reported to alleviate nausea, vomiting, hyperacidity, dyspepsia, and flatulence. *Chyawanaaprasha* has also been found to relieve gastritis, peptic ulcer, gut cramps, and correct the gastrointestinal functions. It purifies blood, works as detoxifier, and promotes healthy liver function. [22]It protects and strengthens the liver and kidneys and improves lipid and protein metabolism. [23,24,25,26,27]The herbs of CP, such as *Nagakesar, Tejpatra, Ela, Dalchini. Paatla, Agnimanth, Gambhari, Bael, Shyonak. Sarivan. Draaksha, Haritaki,* honey, *Bhumyamalaki, Kachur, Pushkarmul, Musta, Kaknasa. Vidaarikand,* and *Aguru,* help to improve digestion and metabolism.[28,29]It is common practice to add the nourishing honey and cow ghee (clarified butter) in certain Ayurvedic herbal formulations to act as "a transporter of potency of herbs" (aka *Yogavahi* in Ayurveda), and it is believed to promote the quick absorption and assimilation of various herbal constituents in the distant tissues (lacto-vegan diet comprising milk and milk products is strongly recommended in Ayurveda). In the case of CP, its sweet flavor favors its quick assimilation and facilitates better passage of its active ingredients into cell walls.[30,31]

7.3. Protect and Strengthens the Respiratory System

A regular intake of CP strengthens the trachea–bronchial tree and hence improves the immunity and functioning of the respiratory system. It helps to treat respiratory infections, allergic cough, asthma, bronchospasm, rhinitis, seasonal or nonseason respiratory disorders, common cold, and tuberculosis, and thus strengthens the respiratory system. It is also used as an adjunct to antitubercular drugs to augment their bioactivity and prevent their side effects.[32,33,34]*Pipali, Kantakaari, Kakdasingi, Bhumyamalaki, Vasa, Pushkarmul, Prishnaparni, Agnimanth, Shalparni,* sesame oil, and *Amla* help to nourish the respiratory system. [35,36,37]

7.4. Antioxidant, Adaptogenic, and Immune-Booster

The combination or cocktail of phytocompounds (as in CP) offers better antioxidant effects than single antioxidant therapy. [38]The adaptogenic characteristics of CP are attributable to its excellent antiaging and anxiolytic supplement. The revitalizing and tonic effects of CP could be due to its rich antioxidant composition, bioactive phytoconstituents, such as carotenoids, flavonoids, tannins, and phenolic compounds,[39,40,41,42] though supportive experimental and

clinical evidence is scarce. Recent investigations have ascertained that polyphenols (gallic acid, catechin, epicatechin) in CP exert key antioxidant potential and is known to possess potent neuroprotective, cytoprotective, and antioxidant properties. Piperine content in CP act as a bioavailability enhancer.[43]*Chyawanaaprasha* is an effective adaptogenic.[44] Some clinical reports do support the adaptogenic and antioxidant effect of CP on normal and depressive subjects.[45]

Chyawanaaprasha strengthens immunity and facilitates the healing process.[46] Vitamin C also helps to revive and restore the energy loss of the human body. [47]Vitamin C conjugates to gallic acid molecules and reducing sugars and facilitates the development of intricate synergistic effects with other phytoconstituents.[48] Polyphenols are acknowledged to be more effective antioxidants in vitro than vitamin E and C on a molar basis. Polyphenolic compounds in several herbs and natural honey in CP are found beneficial in various human degenerative diseases, cardiovascular disorders, and diabetes. Several natural antioxidants, especially flavonoids, exert multiple bioactivities, including antibacterial, antiviral, anti-inflammatory, antiallergic, antithrombotic, and vasodilator effects.[49]The minute quantities of spice components of CP are also known for their wide range of health benefits by their antioxidative, chemopreventive, antimutagenic, anti-inflammatory, immune-modulatory effects on cells and several beneficial effects on the gastrointestinal, cardiovascular, respiratory, metabolic, reproductive, neural, and other systems.

7.5. Nootropic Potential

CP nourishes the brain cells, harmonizes neuronal activities, improves memory, and enhances learning ability, storage, recall, and intellect. It relaxes the central nervous system (CNS), thereby acting as an anxiolytic and an antidepressive, and alleviates insomnia. Research has also suggested its procholenergic activity and antiamnesic potential.[50,51,52]The rich *Amla* and ascorbic acid contents play a vital role in such activities.[53,54]*Musta, Vidaarikand, Neelkamal, Aguru, Nagakesar, Guduchi, Ashwagandha, Shalparni, Prishnaparni*, and *Amla* possess potent antioxidant and anti-inflammatory properties, thereby improving CNS functions. [55,56]

7.6. Cardiotonic Value

Chyawanaaprasha is a potent cardiotonic. It strengthens the structure and functions of the heart and corrects the heart pumping rhythm by recuperating blood flow to its musculature. *Chyawanaaprasha* is also reported to correct blood disorders and improve structure and functions of the vascular system. *Chyawanaaprasha* also exerts antihyperlipidemic activity and alleviates metabolic impairments.[57] Components of CP—*Amla, Neelkamal, Punarnawa, Pushkarmul, Kachur, Vasa, Bala, Sarivan, Pithawan, Barikateri* and *Gokshur*—are well-recognized in their ability to rejuvenate and restore the cardiovascular system functions .[58,59]*Amla* has shown antiatherogenic, anticoagulant, hypolipidemic, antihypertensive, antioxidant, antiplatelet, and vasodilatory effects, as well as lipid deposition inhibitory properties.[60]

7.7. Potent Aphrodisiac and Balances the Endocrine System

Regular intake of CP improves sexual life, boosts virility, and fertility in each gender. It improves the functioning of gonads, strengthens the endocrine system, and balances the

hormonal flow. It improves semen quality in males and the menstrual cycle in females.[61,62,63]Ingredients such as *Gokshur, Varahikand*, sesame oil, *Shatavari, Vidaarikand, Bala, Jivanti, Mudagparni, Mashaparni, Ashwagandha*, and *Vanshalochan* contribute to the aphrodisiac and vitalizing properties of CP.[64,65]

7.8. Favorable Effects on Lipid Profile and Glycaemic Levels

Owing to its rich sugar and honey contents, CP is generally considered to be contraindicated in diabetics; however, contrary to this widespread belief, CP is reported to reduce postprandial hyperglycemia in the oral glucose tolerance test and substantially reduce blood cholesterol level compared to vitamin C. [66]*Chyawanaaprasha* is also an efficient hypolipidemic. [67]

7.9. Other Preventive, Promotive and Curative Health Benefits

Chyawanaaprasha helps in better absorption of calcium and protein synthesis, thereby strengthening bones and teeth, and improving muscle tone. It also promotes growth in juveniles and helps in gaining weight. Its profound *Rasayana* effect due to potent herbs like *Amla, Guduchi,* and *Ashwagandha* helps to balance the body's natural processes and modulate the neuroendocrine-immune activities.[68] It eliminates blood impurities and acts as a natural detox.[69,70,71]It promotes hair growth, skin complexion, cures dermal infections, and improvises personality characteristics by imparting splendor, exquisiteness, youthfulness, wisdom, vitality, and glow.[72]CP improved Hb levels consistently, irrespective of the season of its consumption, along with improvement in pulmonary function tests and immunological parameters.[73,74]

8. Toxicity and Safety Concerns

Although numerous works have been carried out on this formulation, no evident information on toxicity has been available until now. If taken in prescribed dosage, CP is considered to be safe.

9. Perspectives and Future Directions

Chyawanaaprasha is a traditional recipe which is manufactured and has been popularized by firms. Each firm has held information generated by them as propriety and has not published them in research journals, perhaps to maintain ownership of this information and link to their product. This could also limit contemporary scientists' ability to access and review data on traditional products through online searches that they are used to.[75]This traditional product is a complex mixture comprising dozens of active phytocompounds with very broad biological effects on different targets. In such a complex nature of product, it is very challenging to describe in detail the efficacy supported by the mechanism of actions. Moreover, in this form, the synergistic or antagonistic effects of compounds are difficult to deal with and are not evincible from the present literature. Nevertheless, a wide scope is open for future researchers to reach better conclusions.

10. Conclusions

Natural health products with medicinal value are gaining importance in clinical research as they offer better alternatives, owing to fewer side-effects and cost-effectiveness than conventional

synthetic nutraceuticals. Among the vast library of such products, CP is immensely valuable in terms of therapeutics and global trade. Despite the traditional implementation in ayurvedic medicine and the reported efficacy evidence, there is a requirement of controlled experiments on the effect of the main active compounds and their synergistic or antagonistic effect in order to clarify their mechanism of action. This could also lead to improvement of the available market brands of CP that is not necessarily the optimal version. In fact, strict compliance with the centuries-old recipe alone is not per se a guarantee of success in absence of appropriate scientific evidence. To sum up, CP is an Ayurvedic superfood and healer par excellence that strengthens the immune system and revitalizes the psychosomatic system, a superior, nutritious, and safe health tonic that is beneficial for all age groups and genders alike.

References:

[1]Parle M., Bansal N. Traditional medicinal formulation, *Chyawanprash*—A review. Ind. J. Tradit. Knowl. 2006;5:484–488.

[2]Trivedi R.P. Bhaishajya Kalpana. Dhanvantari Karyalaya; Aligarh, India: 1951. p. 260.

[3] Sharma R.K., Charak S. Chikitsa Sathanam. Volume II. Motilal Banarasidas; Varanasi, India: 1954. p. 4.

[4]Sharma P.V. Caraka Samhita. second ed. Volume II. Chaukhamba Orientalia; Varanasi, India: 1992. pp. 3–10.

[5]Ram G., Amrit S., Khem R. Sri Krishan Das. Sri Vanketshwar Steam Press; Bombay, India: 1948. p. 3.

[6]Mehta P.M. Realms of Ayurveda by Pandit Shiv Sharma. Arnold-Heinemann Publishers; New Delhi, India: 1979. History of Indian Medicine.66p

[7]Rao R.S.K. Encyclopaedia of Indian Medicine-Historical Perspective. Volume I. Popular Prakashan; Bombay, India: 1985. P. 25.

[8] Bates D. Knowledge and the Scholarly Medical Traditions. Cambridge University Press; Cambridge, MA, USA: 1995. 325p [Google Scholar]

[9]Anonymous. The Ayurvedic Formulary of India. Ministry of Health & Family Welfare; New Delhi, India: 2003. p. 37. [Google Scholar]

[10] Balakrishna A., Srivastava A., Mishra R.K., Patel S.P., Vashishtha R.K., Singh A., Jadon V., Saxena P. Astavarga plants—Threatened medicinal herbs of north-west Himalaya. Int. J. Med. Arom. Plants. 2012;2:661–676. [Google Scholar]

[11]Rastogi S., Bala S., Govindrajan R., Rawat A.K., Mehrotra S. Quantitative analysis of Chyawanprash: A well-known Ayurvedic Formulation. Ind. J. Pharm. Sci. 2004;66:753–757. [Google Scholar]

[12]Kumar A., Kaur P., Rinwa P. Evaluation of morphological, phytochemical and physicochemical properties of Indian polyherbal formulation, Chyawanprash for quality evaluation. Asian J. Pharm. Educ. Res. 2012;1:121–140. [Google Scholar]

[13] Virk J.K., Gupta V., Kumar S., Singh R., Bansal P. Ashtawarga plants—Suffering a triple standardization syndrome. J. Tradit. Complement. Med. 2017;7:392–399. doi: 10.1016/j.jtcme.2016.12.011. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

[14]Ojha J.K. Chyawanprash from Vedic and Genomic Era. Chaukhamba Sanskrit Pratishtha; New Delhi, India: 2003. [Google Scholar]

[15]Anonymous. Ayurvedic Pharmacopeia of India Part–II (Formulation) 1st ed. Volume I Department of AYUSH; New Delhi, India: 2007. [Google Scholar]

[16]Govindarajan R., Singh D.P., Rawat A.K. High pressure liquid chromatographic method for the quantification of phenolics in chyavanprash. J. Pharm. Biomed. Anal. 2007;43:527–532. doi: 10.1016/j.jpba.2006.08.005. [PubMed] [CrossRef] [Google Scholar]

[17]Agte V.V., Mengale S.S., Akkalkotkar M., Paknikar K.M., Chiplonkar S.A. Antioxidant and trace element potential of Chyavanpraash and some Ayurvedic preparations. Ind. J. Tradit. Knowl. 2003;2:215–223. [Google Scholar]

[18]Agte V.V., Mengale S.S., Akkalkotkar M., Paknikar K.M., Chiplonkar S.A. Antioxidant and trace element potential of Chyavanpraash and some Ayurvedic preparations. Ind. J. Tradit. Knowl. 2003;2:215–223.

[19]Kumar A., Rinwa P., Kaur P. Chyawanprash: A wonder Indian Rasayana from Ayurveda to Modern Age. Crit. Rev. Pharm. Sci. 2012;1:1–8. [Google Scholar]

[20]Datta Goutam K., Debnath P.K. Stress Adaptation in Ayurveda by Immunomodulatory Rasayana; Proceedings of the National Seminar on Rasayana, CCRAS; New Delhi, India. 8–10 March 1999; pp. 60–75. [Google Scholar]

[21] Ernst W. Plural Medicine, Tradition and Modernity, 1800–2000. Routledge; London, UK: New York, NY, USA: 2002. 187p [Google Scholar]

[22] Shah N.C. Bharat Bhaishjya Ratnakar. Volume II. B Jain Publishers Private Ltd.; New Delhi, India: 1999. 164p [Google Scholar]

[23] Nilakash S., Jonnalagadda V.G., Chawda M.B., Thakur K.S., Vahalia M.K., Shitut S.S. Acute and Sub-chronic Toxicity (90-Day) Study of Swamala in Wistar Rats. Pharm. Sci. 2014;20:52–60. [Google Scholar]

[24]Handa S.S., Sharma A., Chakraborti K.K. Natural products and plants as liver protecting drugs. Fitotherapy. 1986;57:307–321. [Google Scholar]

[25]Jose J.K., Kuttan R. Hepatoprotective activity of *Emblica officinalis* and Chyawanprash. J. Ethnopharmacol. 2000;72:135–140. doi: 10.1016/S0378-8741(00)00219-1. [PubMed] [CrossRef] [Google Scholar]

[26]Roy A.K., Dhir H., Sharma A., Talukder G. Phylanthusemblica fruit extract and ascorbic acid modify hepatotoxic and renotoxic effects of metals in mice. Int. J. Pharmacogn. 1991;44:55–60. [Google Scholar]

[27]Gulati R.K., Agarwal S., Agarwal S.S. Hepatoprotective studies on *Phyllanthus emblica* Linn. and quercetin. Ind. J. Exp. Biol. 1995;33:261–268. [PubMed] [Google Scholar]

[28]Sharma P.V. Dravayagun Vigyan. Volume II. Chaukhamba Bharati Academy; Varanasi, India: 2003. 535p [Google Scholar]

[29]Trikam Y. Dravayagunvigyanam. Shree Sharma Ayurved Mandir; Datiya, India: 1979. 465p [Google Scholar]

[30] Chunekar K.C. Bhav Prakash Nighantu. Chaukhambha Bharati academy; Varanasi, India: 2002. 788p [Google Scholar]

[31]Tripathi R.D. Ashthangsangrah. Chaukhambha Sanskrit Pristhan; New Delhi, India: 2003. 106p [Google Scholar]

[32] Ojha J.K., Khanna N.N., Bajpay H.S., Sharma N. A clinical study on Chyawanprash as an adjuvant in the treatment of pulmonary tuberculosis. J. Res. Ind. Med. 1975;10:11–14. [Google Scholar]

[33]Ojha J.K., Bajpai H.S., Sharma P.V., Khanna N.N., Shukla P.K., Sharma T.N. Chyawanprash as an anabolic agent; An experimental study (preliminary work) J. Res. Ind. Med. 1973;8:11–14. [Google Scholar]

[34]Debnath P.K., Chattopadhyay J., Mitra A., Adhikari A., Alam M.S., Bandopadhyay S.K., Hazra J. Adjunct therapy of Ayurvedic medicine with anti-tubercular drugs on the therapeutic management of pulmonary tuberculosis. J. Ayurveda Integr. Med. 2012;3:141–149. doi: 10.4103/0975-9476.100180. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

[35]Sharma P.V. Dravayagun Vigyan. Volume II. Chaukhamba Bharati Academy; Varanasi, India: 2003. 535p [Google Scholar]

[36]Trikam Y. Dravayagunvigyanam. Shree Sharma Ayurved Mandir; Datiya, India: 1979. 465p [Google Scholar]

[37]Sharma P.V. Clinical Uses of Medicinal Plants. Chaukhambha Visvabharati; Varanasi, India: 1996. 33p [Google Scholar]

[38]Liu R.H. Potential synergy of phytochemicals in cancer prevention: Mechanism of action. J. Nutr. 2004;134:3479–3485. doi: 10.1093/jn/134.12.3479S. [PubMed] [CrossRef] [Google Scholar]

[39]Govindarajan R., Vijayakumar M., Pushpangadan P. Antioxidant approach to disease management and the role of ‘Rasayana’ herbs of Ayurveda. J. Ethnopharmacol. 2005;99:165–178. doi: 10.1016/j.jep.2005.02.035. [PubMed] [CrossRef] [Google Scholar]

[40]Jeena K.J., Kuttan R. Antioxidant activity of *Emblica officinalis*. J. Clin. Biochem. Nutr. 1995;19:63. [Google Scholar]

[41]Kumar A., Kaur P., Rinwa P. Comparative study of various marketed brands of Indian Chyawanprash for their anti-anxiety and anti-oxidant potential. Int. J. Pharm. Res. Biosci. 2012;1:296–310. [Google Scholar]

[42]Khopde S.M., Priyadarsini K.I., Mohan H., Gawandi V.B., Satav J.G., Yakhmi J.V., Banavaliker M.M., Biyani M.K., Mittal J.P. Characterizing the antioxidant activity of Amla (*Phyllanthus emblica*) extract. Curr. Sci. 2001;81:185–190. [Google Scholar]

[43] Kasar R.P., Laddha K.S., Chaudhary J., Shukla A. Development of quality control methods for poly herbal formulation, Chyawanprash. Nat. Prod. Radian. 2006;5:33–41. [Google Scholar]

[44]Mehrotra S., Rawat A.K., Singh S. Standardization of popular ayurvedic adaptogenic preparation "Chyawanprash" and ethnokotary of its ingredients. Ethnobotany. 1995;7:1–15. [Google Scholar]

[45] Yadav J.S., Thakur S., Chadha P. Chyawanprash Awaleha: A genoprotective agent for Bidi smokers. Int. J. Hum. Genet. 2003;3:33–38. doi: 10.1080/09723757.2003.11885825. [CrossRef] [Google Scholar]

[46]Sur T.K., Pandit S., Mukherjee R., Debnath P.K., Bandopadhyay S.K., Bhattacharya D. Effect of Sonachandi Chyawanprash and Chyawanprash Plus, two herbal formulations on immunomodulation. Nepal Med. Coll. J. 2004;6:126–128. [PubMed] [Google Scholar]

[47]Mirunalini S., Vaithiyanathan V., Krishnaveni M. Amla: A novel Ayurvedic herb as a functional food for health benefits—A mini review. Int. J. Pharm. Pharm. Sci. 2013;5:1–4. [Google Scholar]

[48]Singh V.K., Palbag S., Singh N.K. Comparative evaluation of furfural in branded and local honey sample by UV spectroscopy. Int. J. Pharm. Pharm. Sci. Res. 2012;2:95–96. [Google Scholar]

[49]Shah R., Kathad H., Sheth R., Sheth N. In vitro antioxidant activity of roots of *Tephrosia purpurea* Linn. Int. J. Pharm. Pharm. Sci. 2010;2:30–33. [Google Scholar]

[50]Bansal N., Parle M. Beneficial effect of chyawanprash on cognitive function in aged mice. Pharm. Biol. 2011;49:2–8. doi: 10.3109/13880209.2010.489904. [PubMed] [CrossRef] [Google Scholar]

[51]Sailesh K.S., Archana R., Mishra S., Symphoria Mukkadan J.K. Chyawanprash on cognitive, autonomic, and repiratory parameters in college students. Int. J. Res. Ayurveda Pharm. 2014; 5:435–438. [Google Scholar]

[52]Parle M., Bansal N. Antiamnesic Activity of an Ayurvedic Formulation Chyawanprash in Mice. Evid. Based Complement. Altern. Med. 2011;2011 doi: 10.1093/ecam/neq021. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

[53] Parle M., Dhingra D. Ascorbic acid: A promising memory enhancer in mice. J. Pharmacol. Sci. 2003; 93:129–135. doi: 10.1254/jphs.93.129. [PubMed] [CrossRef] [Google Scholar]

[54]Vasudevan M., Parle M. Effect of Anwala Churna (Emblica officinalis GAERTN): An ayurvedic preparation on memory deficit rats. Yakugaku Zasshi. 2007;127:1701–1707. doi: 10.1248/yakushi.127.1701. [PubMed] [CrossRef] [Google Scholar]

[55]Sharma P.V. Dravayagun Vigyan. Volume II. Chaukhamba Bharati Academy; Varanasi, India: 2003. 535p [Google Scholar]

[56]Trikam Y. Dravayagunvigyanam. Shree Sharma Ayurved Mandir; Datiya, India: 1979. 465p [Google Scholar]

[57]Manjunatha S., Jaryal A.K., Bijlani R.L., Sachdeva U., Gupta S.K. Effect of Chyawanprash and vitamin C on glucose tolerance and lipoprotein profile. Ind. J. Physiol. Pharmacol. 2001;45:71–79. [PubMed] [Google Scholar]

[58]Sharma P.V. Dravayagun Vigyan. Volume II. Chaukhamba Bharati Academy; Varanasi, India: 2003. 535p [Google Scholar]

[59]Trikam Y. Dravayagunvigyanam. Shree Sharma Ayurved Mandir; Datiya, India: 1979. 465p [Google Scholar]

[60] Hashem-Dabaghian F., Ziaee M., Ghaffari S., Nabati F., Kianbakht S. A systematic review on the cardiovascular pharmacology of *Emblica officinalis* Gaertn. J. Cardiovasc. Thorac. Res. 2018; 10:118–128. doi: 10.15171/jcvtr.2018.20. [PMC free article] [PubMed] [CrossRef] [Google Scholar]

[61]Sharma P.V. Cakradatta: A Treatise on Principles and Practices of Ayurvedic Medicine. Chaukhambha Orientalia; Varanasi, India: 1954. 129p [Google Scholar]

[62]Shastri A.D. BhaishjyaRatnavali. Chaukhambha Sanskrit Bhawan; Varanasi, India: 1996. 286p [Google Scholar]

[63]Verma M.D., Singh R.H., Upadpa K.N. Physiological, endocrine and metabolic studies on the effect of rasayana therapy in aged persons. J. Res. Ind. Med. 1973;8:1–10. [Google Scholar]

[64]Sharma P.V. Dravayagun Vigyan. Volume II. Chaukhamba Bharati Academy; Varanasi, India: 2003. 535p [Google Scholar]

[65]Trikam Y. Dravayagunvigyanam. Shree Sharma Ayurved Mandir; Datiya, India: 1979. 465p [Google Scholar]

[66]Manjunatha S., Jaryal A.K., Bijlani R.L., Sachdeva U., Gupta S.K. Effect of Chyawanprash and vitamin C on glucose tolerance and lipoprotein profile. Ind. J. Physiol. Pharmacol. 2001;45:71–79. [PubMed] [Google Scholar]

[67] Mathur R., Sharma A., Dixit V.P., Varma M. Hypolipidaemic effect of fruit juice of *Emblica officinalis* in cholesterol-fed rabbits. J. Ethnopharmacol. 1996;50:61–68. doi: 10.1016/0378-8741(95)01308-3. [PubMed] [CrossRef] [Google Scholar]

[68]Sharma R., Amin H. Rasayana Therapy: Ayurvedic contribution to improve quality of life. World J. Pharmacol. Res. Tech. 2015;4:23–33. [Google Scholar]

[69]Ernst W., editor. Plural Medicine, Tradition and Modernity, 1800–2000. Routledge; London, UK: New York, NY, USA: 2002. 272p [Google Scholar]

[70] Sharma R., Amin H., Prajapati P., Ruknuddin G. Therapeutic Vistas of Guduchi (*Tinospora cordifolia*): A medico-historical memoir. J. Res. Educ. Ind. Med. 2014;XX:113–128. [Google Scholar]

[71]Sharma R., Kabra A.,Rao M.M., Prajapati P.K. Herbal and Holistic solutions for Neurodegenerative and Depressive disorders: Leads from Ayurveda. Curr. Pharm. Des. 2018;2018:2597–2608. doi: 10.2174/1381612824666180821165741. [PubMed] [CrossRef] [Google Scholar]

[72] Sharma P.V. Dravayagun Vigyan. Volume II. Chaukhamba Bharati Academy; Varanasi, India: 2003. 535p [Google Scholar]

[73]Ojha J.K. Chyawanprash from Vedic and Genomic Era. Chaukhamba Sanskrit Pratishtha; New Delhi, India: 2003. [Google Scholar]

[74] Trikam Y. Dravayagunvigyanam. Shree Sharma Ayurved Mandir; Datiya, India: 1979. 465p [Google Scholar]

[75]Narayana D.B., Durg S., Manohar P.R., Mahapatra A., Aramya A.R. Chyawanprash: A review of therapeutic benefits as in authoritative texts and documented clinical literature. J.

Ethnopharmacol. 2017;197:52:60. doi: 10.1016/j.jep.2016.07.078. [PubMed] [CrossRef] [Google Scholar]