

Use of Black Cardamom (*Amomum Subulatum* Roxb.) & Aloe Vera (*Aloe Barbadensis* Mill.) As Medicinal Plants for Prevention of Cardiovascular Diseases

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Abstract

Heart diseases have become more prevalent in today's world. Many herbs have been used to prevent and cure these heart diseases. Due to the recent increase in the rate of heart diseases, herbal medicines and traditional herbal treatments have revived a great interest. A number of herbs have potent cardiac glucosides. They have positive inotropic actions on the heart. The purpose of this review is to provide information about the use of Black cardamom (*Amomum subulatum* Roxb.) & Aloe vera (*Aloe barbadensis* Mill.) as medicinal plants for prevention of cardiovascular diseases. Many systematic literature searches were carried out. The available information about Black Cardamom (*Amomum subulatum* Roxb.) & Aloe vera (*Aloe barbadensis* Mill.) as medicinal plants for cardiovascular diseases was collected through electronic search and library search. This review highlights the use of Cardamom and Aloe vera to prevent heart diseases. However, multidisciplinary research in this aspect is still required.

Keywords: *Cardiovascular, Heart Diseases, Heal, Herbs, Medicinal Plants.*

Introduction

Cardiovascular diseases (CVD's) are also known as heart diseases. The heart conditions that include diseased vessels, structural problems and blood clots are known as cardiovascular diseases (CVD's). They include coronary heart disease (also known as heart attacks), stroke, hypertension, peripheral artery disease, rheumatic heart disease, congenital heart disease and heart failure [1]. These are caused by the problem in heart and blood vessels.

According to WHO, cardiovascular diseases cause the death of 17.9 million people every year. It accounts for 31% of the total global deaths. Heart attacks and strokes account for 80% of total deaths caused by the cardiovascular diseases [2, 3]. Approximately 7.4 million deaths were caused due to heart attacks and 6.7 million deaths were caused by strokes [1].

The main cause for heart attacks and strokes are, use of tobacco, unhealthy diet, enhanced level of LDL (Low Density Lipoprotein), lack of physical activities, excessive use of alcohol, hypertension, diabetes etc. [4]. High blood pressure is the leading cause of stroke. It occurs when the pressure of blood in the arteries is too high.

Plants have been an integral part of the society since the beginning of the human civilization. They are herbaceous plants that are used to add flavour and colour to all type of meals. Herbs

contribute to more than 60 to 70% in the development of medicines directly or indirectly in the today's world [2]. The herbs such as cardamom and Aloe vera are not only used to prevent or cure the heart diseases but also strengthen the muscles of the heart.

The plants play an important role in prevention and treatment of cardiovascular diseases. Aloe Vera is used to prevent heart attacks, cardamom is used to control high blood pressure and prevent hypertension.

Black Cardamom (*Amomum subulatum* Roxb.)

Common name: Badhi elaichi [5]

Part used: leaf, seed, fruit.

Botanical description of black cardamom

Black cardamom is a perennial herb that has subterranean rhizomes. The rhizome gives rise to a new shoots and spikes. The shoot is leafy. The height of plant is 1.5 m to 3m [5]. It matures when the plant is in 3rd year of growth. Leaves are green to dark green in colour. Inflorescence is spike. A short peduncle is present. It bears 40 to 50 flower buds present in an acropetal sequence. Seeds have unique taste and smell. Fruit of black cardamom is a trilocular, many seeded capsule. The fruit consists of 15 to 20 sporadic, dentate – undulate wings. They come out from peak to base for 66% of length [5, 6]. It is mainly grown in India.

Chemical composition of Black Cardamom [5]

S.no.	Chemical components	Value g/kg
2.	1,8-cineole	655
3.	Alpha-terpineol	33
4.	Limonene	36
5.	Alpha-pinene	27.8
6.	Beta-pinene	33.4

It is also known as badi elaichi. It consists of alpha-terpineol, alpha-terpinyl acetate, 1,8-cineole, limonene, alpha-pinene, cymene, beta-pinene, sabinene [5]. Some other components of black cardamom are terpinolene and myrcene

Role of black cardamom in prevention of cardiovascular diseases

The components present in black cardamom such as 1, 8-cineole, terpinolene, terpinyl acetate, limonene, myrcene etc. are known for having hypertensive potential and the hypertension is main cause for cardiovascular diseases [7, 8]. So the black cardamom helps to lower down the risk of Cardiovascular Diseases (CVD). It is very effective to decrease blood pressure (BP) by the enhancement of fibrinolysis and the diuretic effect of cholinergic effects [8, 9 and 10]. It is also used as anti-oxidant.

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Aloe vera (*Aloe barbadensis* Mill.)

Common name: Aloe vera

Part Used: Leaves

Botanical description of the plant

Aloe vera is a draught resisting, perennial, succulent plant [12, 13]. The botanical name of Aloe vera is *Aloe barbadensis* Miller. It belongs to the family Liliaceae. At present, more than 300 varieties have been found around the world. Leaves are the medicinally important part of the Aloe vera [14]. The leaves are stiff grey- green in colour, lanced shaped. They contain a gel in the central mucilaginous pulp. There are many products of Aloe vera such as dried exudates that are excreted from the aloin cells and the oil that is extracted by organic solvents [12, 14]. The commercial value depends upon the type of the product.

Role of Aloe Vera

Aloe vera is a popular medicinal plant. It helps to cure many diseases. It is very good for heart, hair, skin etc.

Chemical composition of aloe vera [15]

S.no.	Chemical components	Value
1.	Ash	0.04
2.	Crude fat	0.09
3.	Crude protein	0.06
4.	Crude fiber	0.30
5.	Ascorbic acid	0.05

Phytochemical properties of Aloe vera

A plant of Aloe vera contains flavonoids, lectins, terpenoids [12, 16, 17], cholesterol, fatty acids, anthraquinones, chromones (8-C-glucosyl-7-O- methylaloedial, isoaloesin-D, 8-C-glucosyl-noreugenin, neoaloesin-A, rabaichromone) [12, 18, 19], monosaccharides and polysaccharides (hemicelluloses, glucomannon, pectins, acemannon and derivatives of mannose)[12, 20, 21], sterols (lupeol, sitosterol and compesterol), Tannins, salicylic acids, enzymes, organic acids, vitamins, saponins, minerals [16,26], anthrone, aloin, aloetic acids, aloe modin (3-hydroxymethyl-chrysazin) choline and choline salicylate complex, sapogenins, mucopolysaccharides similar to hyaluronic acid and enzymes such as amylase, catalase, allinase and cellulase [12]. The leaves of Aloe vera contain a large number of bioactive compounds. Among them, mannans, polymannans, anthraquinones, some lactins are best studied [16, 27].

Role of Aloe vera in prevention of cardiovascular diseases

As we discussed earlier, the high cholesterol is an important factor that leads to the heart diseases and strokes. According to the conducted medical studies, the benefits of Aloe vera gel were proven when it is taken internally. The results prove that when a patient of heart disease and high cholesterol take the Aloe vera gel, it reduces the risk level to the minimum.

The Aloe vera naturally lowers down the high cholesterol and triglyceride level [24].

Aloe vera is also helpful in the treatment of atheromatous heart diseases. It is also helpful for the reduction of total serum cholesterol and serum triglycerides [25]. One of the highly prevalent health problems in the world, is Metabolic syndrome (MS). It is associated with various risk factors such as hyperglycemia, dyslipidaemia, obesity and hypertension. All these factors increase the risk of cardiovascular disease and type II diabetes mellitus [26]. Aloe vera lowers down the risk of these diseases.

Uses

Aloe vera gel lowered the level of triacylglyceride in plasma and liver. The Histological examinations of periepididymal fat pad show that Aloe vera gel decreases the average size of adipocytes [11, 27].

Conclusion

Although, the role of cardamom and Aloe vera to prevent cardiovascular disease have been studied in this review paper, more scientific research is needed on these plants to find the new medicines for prevention of cardiovascular diseases. They have no or a few side effects. The chemical constituents present in these plants have beneficial effects as cardio protectants by various modes of action. They can improve the quality of life of the cardiac patients. So, more research is needed in this field, so that the beneficial aspect of these medicinal plants can be exploited to the fullest of their potential in our medicine system, so as to provide a healthy and safe treatment of the cardiovascular patients.



Fig. 1 Black Cardamom



Fig. 2 Aloe vera

References

- [1]. Rastogi, S., Pandey MM & Rawat, A.K. (2016). Traditional herbs: a remedy for cardiovascular disorders. *Phytomedicine.*, 23(11):1082-9.
- [2]. Strasser, T. (1978). Reflections on cardiovascular diseases. *Interdisciplinary science reviews*, 3(3), 225-230.
- [3]. Wu, B.N., Huang, Y.C., Wu. H.M., Hong, S.J., Chiang, L.C. & Chen, J. (1998). A highly selective β_1 -adrenergic blocker with partial β_2 -agonist activity derived from ferulic acid, an active component of *Ligusticum wallichii* Franch. *Journal of cardiovascular pharmacology*, 31(5):750-7.

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- [4]. Ishikawa, T., Kondo, K., & Kitajima, J. (2003). Water-soluble constituents of coriander. *Chemical and Pharmaceutical Bulletin*, 51(1), 32-39.
- [5]. Kapoor, L. D. (2018). *CRC Handbook of ayurvedic medicinal plants*. CRC press.
- [6]. Khare, C. P. (2008). *Indian medicinal plants: an illustrated dictionary*. Springer Science & Business Media. Azimi P, Ghiasvand R, Feizi A, Hosseinzadeh J, Bahreynian M, Hariri M, Khosravi-Boroujeni H. Effect of cinnamon, cardamom, saffron and ginger consumption on blood pressure and a marker of endothelial function in patients with type 2 diabetes mellitus: A randomized controlled clinical trial. *Blood pressure*. 2016 May 3; 25(3):133-40.
- [7]. Kaur, R., Khanna, N. (2012). Pathophysiology and risk factors related to hypertension and its cure using herbal drugs. *Spatula DD*, 2(4):245-56.
- [8]. Verma, S. K., Jain, V., & Katewa, S. S. (2009). Blood pressure lowering, fibrinolysis enhancing and antioxidant activities of cardamom (*Elettaria cardamomum*).
- [9]. Gilani, A.H., Jabeen, Q., Khan, A.U. & Shah, A. J. (2001). Gut modulatory, blood pressure lowering, diuretic and sedative activities of cardamom. *Journal of ethnopharmacology*, 115(3):463-72.
- [10]. Al-Snafi, A. E. (2017). Medicinal plants for prevention and treatment of cardiovascular diseases-A review. *Respiration*, p. 23:25.
- [11]. Gupta, A. & Rawat, S. (2017). Clinical importance of aloe vera. *Research Journal of Topical and Cosmetic Sciences*, p. 8(1):30.
- [12]. Sandeep, K. & JP, Y. (2014). Ethnobotanical and pharmacological properties of Aloe vera: a review. *Journal of Medicinal Plants Research*, 8(48):1387-98.
- [13]. Davis, R.H., Parker, W.L., Samson, R.T. & Murdoch, D.P. (1991). The isolation of an active inhibitory system from an extract of aloe vera. *Journal of the American Podiatric Medical Association*, 81(5):258-61.
- [14]. Ahmed, M. & Hussain, F. (2013) Chemical composition and biochemical activity of Aloe vera (*Aloe barbadensis* Miller) leaves. *International Journal of chemical and biochemical sciences*, 3(5):29-33.
- [15]. Vogler, B.K. & Ernst, E. (1999) Aloe vera: a systematic review of its clinical effectiveness. *British journal of general practice*, 49(447):823-8.
- [16]. King, G. K., Yates, K. M., Greenlee, P.G., Pierce, K.R., Ford, C.R., McAnalley, B.H. & Tizard, I.R. (1995) The effect of Acemannan Immunostimulant in combination with surgery and radiation therapy on spontaneous canine and feline fibrosarcomas. *Journal of the American Animal Hospital Association*, 31(5):439-47.
- [17]. Palermo FA, Cocci P, Angeletti M, Felici A, Polzonetti-Magni AM, Mosconi G. Dietary Aloe vera components' effects on cholesterol lowering and estrogenic responses in juvenile goldfish, *Carassius auratus*. *Fish physiology and biochemistry*. 2013 Aug;39(4):851-61.
- [18]. Nandal, U., Bhardwaj, R.L. (2012) Aloe vera: a valuable wonder plant for food, medicine and cosmetic use—a review. *Int J Pharm Sci Rev Res.*, 13(1):59-67.
- [19]. Rajasekaran S, Ravi K, Sivagnanam K, Subramanian S. Beneficial effects of Aloe vera leaf gel extract on lipid profile status in rats with streptozotocin diabetes. *Clinical and experimental pharmacology and physiology*. 2006 Mar;33(3):232-7.
- [20]. Reddy, C.U., Reddy, K.S., Reddy, J.J. (2011) Aloe vera- A wound healer. *Asian Journal of Oral Health & Allied Sciences*, 1(1):91.

- [21]. Shamim, S., Ahmed, S.W. & Azhar, I. (2004) Antifungal activity of *Allium*, *Aloe*, and *Solanum* species. *Pharmaceutical biology*, 42(7):491-8.
- [22]. Ferro, V.A., Bradbury, F., Cameron, P., Shakir, E., Rahman, S.R. & Stimson, W.H. (2003) In vitro susceptibilities of *Shigella flexneri* and *Streptococcus pyogenes* to inner gel of *Aloe barbadensis* Miller. *Antimicrobial agents and chemotherapy*, 47(3):1137-9.
- [23]. Manvitha, K. & Bidya, B. (2014). *Aloe vera*: a wonder plant its history, cultivation and medicinal uses. *Journal of Pharmacognosy and Phytochemistry*, 2(5):85-8.
- [24]. Bunyapraphatsara, N., Yongchaiyudha, S., Rungpitarangsi, V. Chokeychaijaroenporn, O. (1996). Antidiabetic activity of *Aloe vera* L. juice II. Clinical trial in diabetes mellitus patients in combination with glibenclamide. *Phytomedicine*, 3(3):245-8.
- [25]. Shakib, Z., Shahraki, N., Razavi, B.M. & Hosseinzadeh, H. (2019). *Aloe vera* as an herbal medicine in the treatment of metabolic syndrome: A review. *Phytotherapy Research*, 33(10):2649-60.
- [26]. Kim, K., Kim, H., Kwon, J., Lee, S., Kong, H., Im, S.A., Lee, Y.H., Lee, Y.R., Oh, S.T., Jo, T.H. Park, Y.I. (2009) Hypoglycemic and hypolipidemic effects of processed *Aloe vera* gel in a mouse model of non-insulin-dependent diabetes mellitus. *Phytomedicine*, 16(9):856-63.
- [27]. Al-Snafi, A.E. (2015) The pharmacological importance of *Aloe vera*-A review. *International Journal of Phytopharmacy Research*, 6(1):28-33.