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# HERBAL DRUGS USED IN THE TREATMENT AND PREVENTIONOF CONGESTIVE HEART FAILURE

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## ABSTRACT

The heart is the main organ of the body. Various conditions can affect the functioning of the heart. The ever-increasing population and lack of employment result in stressful condition Which directly affects the functioning of the heart. So, heart disease is the major cause of death worldwide. There are various medications developed for the treatment and prevention of CHF and othercardiovascular diseases. But when we compare Ayurvedic drugs or herbs with allopathic drugs, herbs are more efficient with no existence of side effects. This article highlights the cardiotonic effects of some herbs i.e. Garlic, Arjuna, Cinnamon, Cardamom, Ginger, Digitalis, Fennel, Linseed, Rauwolfia, etc. This drug helps in the treatment and prevention of CHF and it also strengthens the heart muscles.

**KEYWORDS:** CHF- congestive heart failure, CVDs- cardiovascular diseases.

## INTRODUCTION

CHF is a condition when the heart is unable to pump a sufficient amount of blood. In this condition, heart muscles get affected and thereby it does not pump the required amount of blood.

The heart is made up of four chambers which are divided into two halves. Each half contains an atrium and ventricles. Atria receives Deoxygenated Blood and Ventricles pump

oxygenated blood to all organs of the body. But in the case of CHF, ventricles are unable to pump sufficient volume of blood to the body. Sometimes, this condition can be fatal if not treated properly on time.

To avoid CHF or any CVD it is very essential to change the lifestyle. Various herbs can be used in a regular diet to prevent various CVDs.

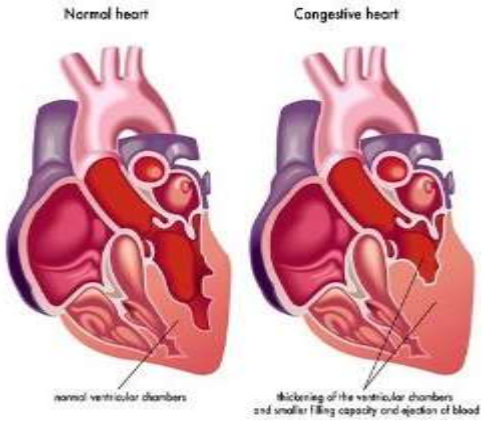


**Fig.1: Normal Heart vs CHF.**

**Symptoms of CHF**

1. Irregular heart beats
2. Chest pain
3. Nausea
4. Shortness of breath
5. Weakness
6. Fatigue
7. Skin gets a blue color in severe conditions due to lack of oxygen.

**Causes/risk factors of CHF**

1. High blood pressure
2. Coronary artery diseases
3. Valvular heart diseases
4. Obesity
5. Tobacco and alcohol intake
6. Diabetes
7. Some diabetic drugs such as rosiglitazone and pioglitazone also increase the risk of CHF.

**Ayurvedic Outlook**

According to Ayurveda CHF is also known as Hridaya Avrodha. Rasa dhatu is most important in the body which is formed after digestion. Rasa dhatu originates from the heart. Mental stress, improper eating habits, and weakened digestive fire lead to the production of toxins. These toxins accumulate in channels and form blockages. Due to this blockage heartis unable to pump a sufficient volume of blood, which then leads to CHF.

**Ayurvedic perspective to manage CHF**

Clearing toxins from the channel and avoiding further accumulation of toxins in the body is mandatory to provide a good and healthy life. There are various herbs present in Ayurveda that are packed with cardioprotective properties and help in strengthening the heart muscles naturally, such as Cinnamon, Cardamom, Ginger, Garlic, Digitalis, Arjuna, Fennel, Linseed, Rauwolfia, and many others.

**Importance of using herbal medications**

1. Herbal medicines do not have any side effects
2. Offers long-lasting effects
3. Cost-effective and accessible
4. Heals naturally
5. People can safely test and try various herbs
6. When used regularly in the diet, it improves the quality of life.

**METHODS**

A systematic literature review was conducted to collect available information on various medicinal plants traditionally used for cardiovascular diseases through electronic searches using Google Scholar, PubMed, Researchgate, etc.

**Cinnamon**

**Fig. 2: Cinnamon.**

**Synonyms**

Cinnamon bark, Kalmi-Dalchini, Ceylon cinnamon.

**Biological Source**

Cinnamon consists of the dried inner bark of the shoots of Cinnamomum zeylanicum Nees., belonging to the family Lauraceae.

**Geographical Source**

Cinnamon, the evergreen tree of tropical areas, is considered to be native to Sri Lanka and the Malabar coast of India. It is also present in Jamaica and Brazil. However, most of the world's requirements are met by Sri Lanka and hence true cinnamon is known as Sri Lanka cinnamon.

**Chemical Constituents**

Cinnamon bark contains about 0.5-1.0 percent volatile oil, 1.2 percent tannins (phlorotannins), mucilage, calcium oxalate, starch, and a sweet substance known as mannitol. The volatile oil is the active constituent of cinnamon. The color is pale yellow (immediately after distillation) and turns red when stored. Bark yields 14-16 percent of 90.0 percent alcohol-soluble extractives.

Cinnamon oil contains 60-70 percent of cinnamaldehyde, 5-10 percent eugenol, benzaldehyde, cuminaldehyde, and other terpenes like phellandrene, pinene, cymene, caryophyllene, etc. Cinnamon oil is yellow to red.

The export of cassia oil during 1994-95 was approximately 16 lakhs.

Uses - Cinnamon helps the heart in various ways. A review of 10 previous studies conducted in 2013 found that consuming a small amount of cinnamon every day reduces total cholesterol, bad LDL cholesterol, and harmful triglycerides of blood fat. It also lowers blood sugar, protecting against diabetes, which increases the risk of heart attack and strokes.

**Cardamom**

**Fig.3: Cardamom.**

**Synonyms**

Cardamom fruits, Cardamom seeds, Cardamon, Small cardamom.

**Biological Source**

Cardamom consists of the dried ripe fruits of Elettaria cardamomum Maton var, miracula Burkill, and family Zingiberaceae, the seeds of which are removed as and when required for use. The seeds should contain not less than 4 percent of volatile oil seeds that constitute the drug.

**Geographical Source**

It occurs in Sri Lanka (parts of Ratnapura and Lunugala districts, Myanmar, and Malaysia). In India, it is scientifically cultivated in Karnataka, Tamil Nadu and Kerala. In Karnataka, it is chiefly cultivated in Mysore and Kurg districts. It also grows wild on Malabar hills.

Guatemala is the most important manufacturer of cardamom.

**Chemical Constituents**

Cardamom seeds contain volatile oil to the extent of 2 percent to 8 percent. The active constituent of the volatile oil in cineule. cardamom seeds contain fixed oil, starch, and proteins.

Uses - one study found that cardamom, an intense spice often found in Indian dishes, may lower blood pressure. Research also shows it reduces the risk of blood clots.

**Ginger**

**Fig.4: Ginger.**

**Synonyms**

Zingiber, Zingiberis, Sunthi.

**Biological Source**

Ginger consists of whole rhizomes or cut, dried, hollow, or unpeeled rhizomes of ginger, a member of the Zingiberaceae family. It contains more than 0.8 percent of total gingerols on a dried basis.

**Geographical Source**

It is said to be native to Southeast Asia but is cultivated in Caribbean islands, Africa, Australia, Mauritius, Jamaica, Taiwan, and India. More than 35 percent of the world's production is from India.

**Chemical Constituents**

Ginger consists of volatile oil (1-4 percent), starch (40-60 percent), fat (10 percent), fiber (15 percent), inorganic material (16 percent), residual moisture (10 percent), and acrid resinous matter (15-8 percent). Ginger oil is constituted of monoterpene hydrocarbons, sesquiterpene hydrocarbon oxygenated mono and sesquiterpenes, and phenyl propanoids. Sesquiterpene hydrocarbon content of all types of ginger oil from different countries is found to be the same and includes Apha - zingiberene, beta- bisabolene, alpha - farnesene, beta - sesquipheflandrene and alpha -curcumene.

The main characteristics of ginger are aroma and taste. The aroma is based on the olfactory principle of essential oils, while the taste, spiciness, and pharmacological effects are derived from phenols ketones of oleo-resin. Various components of volatile oil like isometric terpenic aldehydes bike geranial and citral, cause the delicate and lemony aroma.

Phenolic ketones of oleoresin include gingerols like shogaols, zingerone, paradol, gingerols, hexahydrocurcumin, and also o-methyl ethers of these compounds.

**Uses:-** Research shows that eating this spicy root may reduce your risk of high blood pressure. People who use ginger in a regular diet had the lowest risk. The study authors recommend 2-4 grams (or about half teaspoon to one teaspoon) a day to prevent this heart problem.

**Garlic**

**Fig.5: Garlic.**

Synonyms - Garlic, Allium.

**Biological Source**

This consists of bulbs of the plant called Allium sativum Linn, family Liliaceae. Contains more than 0.8 percent of total gingerol on a dry basis.

**Geographical Source**

Lahsun is cultivated in Central Asia, Southern Europe, the USA, and India.

**Chemical Constituents**

Garlic bulbs contain 29 percent carbohydrates, about 56 percent of proteins (albumin), 0.1 percent of fat, mucilage, and 0.06 to 0.1 percent volatile oil. It also contains phosphorus, iron, and copper. The volatile oil of the drug is the chief active constituent and contains allyl propyl disulfide, diallyl disulfide, alliin, and allicin. Allen by action of enzyme allinlyase is converted into allicin. Garlic oil is yellow and has a specific gravity of 1.046. It is optically inactive.

**Uses -** Helps combat atherosclerosis (hardening of the arteries).

Because garlic can lower high blood pressure, it can also help prevent the scarring and hardening associated with atherosclerosis. Some studies have also shown that aged garlic extract may help reduce the amount of "soft plaque" in your arteries. A 2016 paper that reviewed 20 previous studies showed that garlic significantly lowers blood pressure. Another review study involving 2300 people showed it lowered total and LDL cholesterol and even in people who already had high cholesterol, the rate was only 10%.

**Digitalis**

**Fig.6: Digitalis.**

**Synonyms**

Digtails leaves, Foxglove leaves.

**Biological Source**

Digitalis consists of dried leaves of Digitalis purpurea, belongs to the family Scrophulariaceae, and leaves dried at room temperature immediately after collection. The lenses should contain no more than 5 percent of moisture.

**Geographical Source**

It is cultivated and collected in England, other parts of Europe, the United States, and India.

**Chemical Constituents**

Digitalis contains a 0.2 to 0.45 percent mixture of both primary and secondary cardiac glycosides (cardenolides). Purpurea glycosides A and B and glucogitaloxin are primary glycosides possessing at C-3 of the aglycone, a linear chain of 3 digitoxose moleties terminated by glucose. The secondary glycosides such as digitoxin, gitoxin, and gitaloxin are more absorbed and more stable than primary glycosides.

**Uses**

Digitalis is used to treat heart failure (CHF) and cardiac arrhythmias (atrial arrhythmias).

Digitalis can increase blood flow in the body and reduce swelling in the hands and ankles.

**Fennel**

**Fig.7: Fennel.**

**Synonyms**

Fennel fruits, Fructus foeniculum.

**Biological Source**

Fennel consists of dried ripe fruits of Foeniculum vulgare Miller, a member of the family Umbelliferae. it should contain not less than 0.6 percent of anethole calculated on a dried basis.

**Geographical Source**

It is native to Mediterranean countries and is mainly cultivated in Romania, Russia, Germany, France, India, and Japan. In India, it is grown in the state of Gujarat, Punjab, Maharashtra, Rajasthan, Uttar Pradesh, and West Bengal.

**Chemical Constituents**

Fennel consists of 3 to 7 percent of volatile oil, about 20 percent each of proteins, and fixed oil. The chief active constituent of the volatile oil is a ketone, fenchone (about 20 percent), and phenolic ether anethole (about 50 percent). The other constituents present in it are phellandrene, limonene methyl chavicol, anisic aldehyde, etc. Fenchone. in a colorless pungent liquid with aromatic, and odor. The anethole is sweet in odor and taste. The oil of fennel is a pale-yellow liquid with sp. gr. 0.9530 to 0.973, a refractive index of 1.526-1.538, and optical rotation of +12° to +24°.

**Use**

Fennel is an herb that has long been used as a natural treatment for digestive disorders.Fennel

also has some cardiovascular benefits, such as reducing blood pressure and cholesterol levels.

**Arjuna**

**Fig.8: Arjuna.**

**Synonyms** - Arjun bark, Arjun

**Biological Source**

Arjuna consists of the dried stem bark of the plant known as Terminalia Arjuna Rob, belonging to the family Combretaceae. It contains not less than 0.02 percent of arjungenin on a dried basis.

**Geographical Source**

The tree is common in the Indian peninsula, it is grown by the side of streams and is very common in Chotta Nagpur region.

**Chemical Constituents**

Arjuna contains about 15 per cent of tannins (hydrolysable). It also contains triterpenoid saponins, arjunolic acid, arjunic acid, and arjungenin. In addition, it contains Beta -sitosterol, ellagic acid, and arjunic acid. The crystallizable compounds reported are arjunine and arjunetin, arjunolone and arjunone are the flavonoids reported in Arjuna bark. Calcium, aluminum, and magnesium salts, along with dyes and sugar are the other constituents of Arjuna.

**Uses**

Used as a cardiotonic in heart failure, ischemic, cardiomyopathy myocardium necrosis, and atherosclerosis, Arjuna bark powder protects the heart due to its cardioprotective properties.It helps in strengthening the heart muscles. It also lowers high blood pressure, so used as an antihypertensive agent.

**Rauwolfia**


**Fig.9: Rauwolfia.**

**Synonyms**

Rauwolfia root, Serpentina root, Chhotachand, Sarpgandha.

**Biological Source**

Rauwolfia consists of dried roots of the plant known as Rauwolfia serpentina Benth, member of the family Apocynaceae. Serpgandha contains not less than 0.15 percent of reserpine and ajmalcine, calculated on a dried basis.

**Geographical Source**

Several species of Rauwolfia are discovered withinside the tropical areas of Asia, America, and Africa. It is commercially produced in India, Sri Lanka, Myanmar, Thailand, and the United States. In India, it is grown in Uttar Pradesh, Bihar, Orissa, Tamil Nadu, West Bengal, Karnataka, Maharashtra, and Gujarat.

**Uses**

Rauwolfia alkaloids belong to the general class of medicines called antihypertensives. Rauwolfia alkaloids work by controlling nerve impulses along specific nerve pathways. As a result, it affects the heart and blood vessels, lowering blood pressure.

**Linseed**

**Fig.10: Linseed.**

**Synonyms -** Flax seed; Linum, alsi.

**Biological Source**

Flaxseed is the dried ripe seeds of the flax plant (Linum usitatissimum Linn). family Linaceae. It contains not less than 25 percent of fixed oil and not more than 1 percent of foreign organic matter.

**Geographical Source**

Linum is found in Russia, Canada, the United States, and Argentina. In Egypt, Algeria, Italy, and Greece, only fiber flax is grown, while in India it is grown for both fiber and oil.

It has been detected in India, but only flax is cultivated due to its high oil content.

**Uses**

Some studies suggest that alpha-linolenic acid, which is found in flaxseed and flaxseed oil, might benefit people with heart disease. Early research also shows that flaxseed helps to reduce high blood pressure, which plays an important role in heart disease. Cholesterol levels. Several studies show that using flaxseed daily in diet can reduce total cholesterol and low-density lipoprotein (LDL, or "bad") cholesterol levels.

**RESULT**

This article highlights the cardiotonic effects of herbal medicine viz. Cinnamon, Cardamom, Ginger, Garlic, Digitalis, Arjuna, Fennel, Linseed, and Rauwolfia. These are the herbs that have been used in the treatment and prevention of CHF and other CVDs over several hundreds of years. Currently, various studies show that these herbs can be used effectively in the treatment and prevention of CHF.

## CONCLUSION

As the mortality rate due to CHF is increased in number day by day. Hence, all efforts are required to reduce the risk factors associated with CHF and to improve the quality of life. A healthy lifestyle, use of herbs, balanced diet, and regular physical exercise should be instilled right from the beginning of childhood to avoid any dangerous condition related to the heart or other organs of the body.

Recently, the increasing popularity of alternative medicine and natural products has led to a resurgence of interest in traditional therapies used to treat CHF and cardiovascular diseases. The main goal of this article is to improve symptom management and quality of life, decrease in hospitalization, and decrease overall mortality associated with this disease using different herbs and reducing risk factors. To popularize the forgotten traditional medicinal field and make it known to the people.

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