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Review Article

HERBAL DRUG USED IN CARDIOVASCULAR DISEASEShashank S. kakade^{1*}, Aditi V. Tikait², Dr. Swati P Deshmukh³¹*Student of Shraddha Institute of Pharmacy, Washim²Assistant Professor, Department of Pharmaceutics, Shraddha Institute of Pharmacy, Washim.³Principal, Department of Pharmacology, Shraddha Institute of Pharmacy, Washim.**Abstract:**

Cardiovascular diseases (CVDs) remain a primary cause of death around the world, necessitating the development of innovative and safer therapeutic approaches. Herbal medications such as Hawthorn (*Crataegus spp.*) and Arjuna (*Terminalia arjuna*) have demonstrated outstanding cardio protective, antioxidant, hypolipidemic, and antihypertensive effects. The combination of herbal therapy and conventional medicine provides a comprehensive approach to the treatment and prevention of cardiovascular problems. However, standardization, dosage optimization, and clinical validation are required to ensure their safety and efficacy.

When used properly and supported by scientific study, they can make a substantial contribution to worldwide heart health while also effectively complementing modern pharmaceutical treatments. Herbal products can also be unsafe due to contamination with heavy metals or pesticides, depending on where the plants are grown. Even though there are many challenges, not many herbal products are completely unsafe to use with regular medicines when taken in normal amounts.

Keywords: Cardiovascular Disease, Risk Factor, Role of Herbal Drug, Medicinal Plant Use, Classification, Dose Administration.

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INTRODUCTION:-

Cardiovascular diseases (CVDs) account for 31% of global mortality, killing 17.9 million people annually, according to WHO. Heart attacks and strokes make over 80% of CVDs mortality. Herbs are widely recognized for their therapeutic potential in healthcare, whether for disease treatment or overall well-being (1)

Herbal products like green tea, garlic, Aloe vera, Ginkgo biloba, berberine, ginseng, Nigella sativa, Apium graveolens, thyme, cinnamon, ginger, hawthorn, and pomegranate are found in many widely available dietary supplements that have heart-protective benefits.

The most commonly used herbal treatments for high blood pressure work in different ways through their active ingredients. These effects include reducing oxidative stress, lowering inflammation, preventing blood clots, relaxing blood vessels, affecting enzyme activity, or working better when combined with medication(2)

This is especially dangerous for people who are on medications that have a narrow range of safe doses, as they are more likely to experience harmful side effects. Groups like young babies, elderly individuals, and pregnant women are particularly at risk for toxicity.

Herbal products can also be unsafe due to contamination with heavy metals or pesticides, depending on where the plants are grown. Even though there are many challenges, not many herbal products are completely unsafe to use with regular medicines when taken in normal amounts(3)

Cardiovascular diseases, like heart disease and stroke, are still the most common cause of death worldwide. According to the Global Burden of Disease Study, in 2010, about 29.6% of all deaths were due to cardiovascular diseases. (4)

Medicinal plants include phytochemical substances that are more effective and have fewer negative effects than pharmaceutical versions. Plants and their bioactive phytoconstituents have few adverse effects, making them a promising alternative for treating heart disorders(5)

Herbal extracts should be scientifically evaluated to determine their role in limiting the negative effects of myocardial ischemia and reperfusion injury. This can be done as a preventative measure or as an addition to standard treatment protocols that use synthetic compounds(6)

Young infants, the elderly, and pregnant women are especially prone to poisoning. Patients with compromised liver and kidney function, hereditary disorders, or transplanted organs may need additional monitoring during combination therapy.

Polypragmasia, commonly associated with phytotherapy, increases the likelihood of drug-herb interactions and harmful consequences. Herbal goods may contain heavy metals or pesticides from their growing site(7)

RISK FACTOR FOR CVDs DISEASE:-

- Hypertension: High blood pressure can damage arteries and cause heart disease(8).
- High LDL cholesterol : levels are related with an increased risk of atherosclerosis(9).
- Smoking: Tobacco usage raises the risk of heart disease and stroke(10).
- Diabetes: Diabetes, particularly type 2, is a significant risk factor due to its impact on blood vessels and circulation.
- Unhealthy diet: A diet high in saturated fats, trans fats, and sweets can contribute to obesity and high cholesterol(11)

ROLE OF HERBAL DRUG USE IN CVDs DISEASE :-

- Antioxidant Properties: Many medicinal plants include antioxidants that help reduce oxidative stress, which is a major role in CVD.
- Heart Rhythm Regulation: Some herbs, such as hawthorn, may assist to regulate heart rhythms and improve overall cardiac function(12).
- Anti-inflammatory Effects: Chronic inflammation is connected to cardiovascular problems.
- Stress Reduction: Adaptogenic herbs like ashwagandha can help reduce stress and its cardiovascular effects by lowering cortisol levels.
- Some herbs, such as hawthorn, may assist to regulate heart rhythms and improve overall cardiac function(13)

ROLE OF HERBS :-

- Cardioprotective: Arjuna, Hawthorn, Amla
- Hypolipidemic: Garlic, Guggul, Green Tea, Flaxseed
- Antihypertensive: Garlic, Arjuna, Hawthorn
- Antioxidant / Anti-atherosclerotic: Turmeric, Green tea(14).

MEDICINAL PLANTS :-

- Hawthorn
- Arjuna

**Characteristics of Hawthorn:-
HOWTHORN:**

- Hawthorn (*Crataegus* spp.) is a flowering plant of the *Rosaceae* family that has traditionally been used in herbal medicine, particularly to improve cardiovascular health.
- Flowers, leaves, and berries are all plant components that are utilized medicinally. Hawthorn is known for its potential. (15)

can be separated into two major clades: one that clusters with North American species and the other with European species. Supports merging *Mespilus* and *Crataegus* as a single genus(16)

- Magnoliophyta is a division of the Plantae kingdom, which includes blooming plants called angiosperms (17).



Figure No.6.1 : Hawthorn



Figure No. 6.1.2 : Hawthorn (Flower)

Morphological Characteristics of Hawthorn (*Crataegus* spp.) :-

Family: Rosaceae

Leaves: Leaves are simple, alternating, and lobed (typically 3-7 lobes), with serrated margins; the upper surface is dark green and glossy, while the underside is lighter; petioles are short.

Geographical Classification :-

- A 2025 chloroplast genome analysis of Chinese *Crataegus* species (plus some *Mespilus*) reveals that Chinese hawthorns



Figure No. 6.1.3 : Hawthorn(Leaves)

Taxonomical Classification (18) :

Kingdom	Plantae
Subkingdom	Trachcobionta (vascular plant)
Superdivision	Spermatophyta (seed plant)
Division	Magnoliophyta (flowering plant)
Class	Magnoliopsida (dicotyledons)
Subclass	Rosidae
Order	Rosales
Family	<i>Rosaceae</i>
Genus	<i>Crataegus</i> L.
Species	<i>Crataegus monogyna</i> Jacq., <i>Crataeg</i>

Chemical Constituents:-

- The principal flavonoids are vitexin, hyperoside, rutin, quercetin, isoquercitrin, and vitexin-2"-O-rhamnoside, whereas the OPCs primarily consist of catechin and epicatechin oligomers(19)
- These elements work together to produce antioxidant, vasodilatory, cardiogenic, and lipid-lowering actions as seen in pharmacological and clinical trials(20).

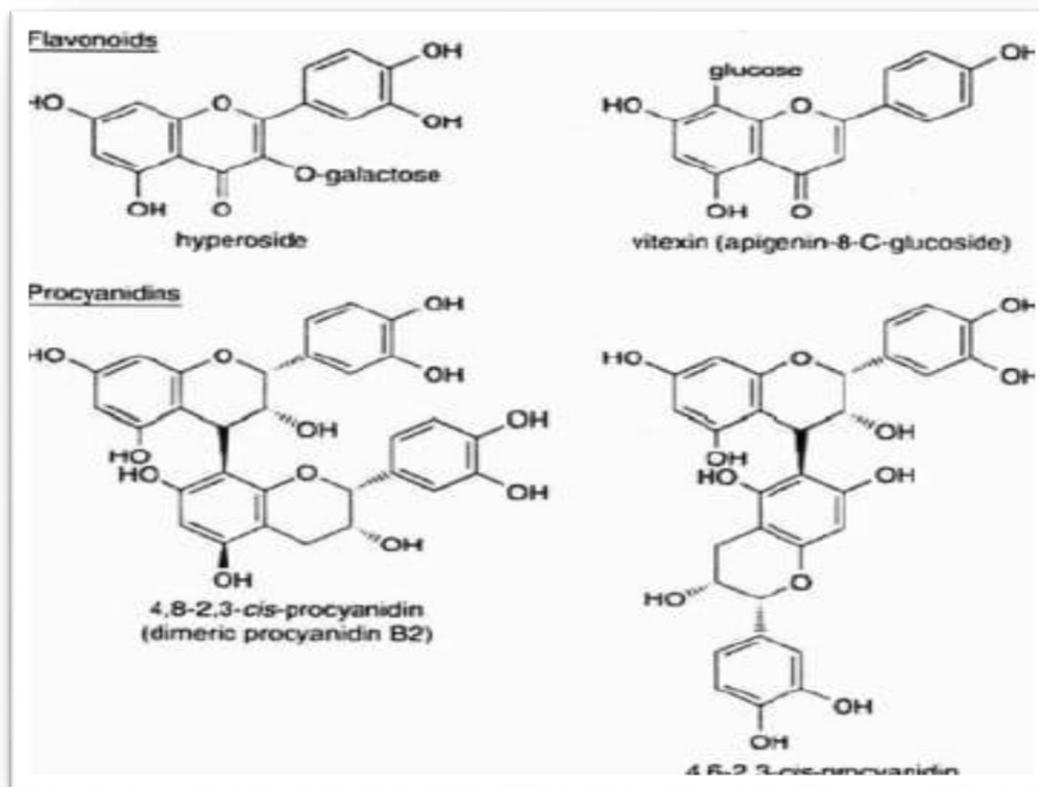


Figure No. 1.4 : Chemical Structure of Hawthorn

Mode of Action :-

Heart Function Support: Studies indicate that hawthorn may improve cardiac contractility. This means that it can increase the strength of cardiac muscle contractions.

Hawthorn may help decrease LDL cholesterol and triglycerides, resulting in better lipid profiles and overall heart health(15)

Uses of Hawthorn :-

- **Hypertension:** Because of its capacity to widen blood vessels, hawthorn may help to lower high blood pressure, making it a promising supplemental treatment(21)

- **Atherosclerosis:** Hawthorn's antioxidant and anti-inflammatory characteristics may help slow the course of atherosclerosis, a disorder marked by the accumulation of plaque in the arteries(22)

Dosage of Administration:

- A specific example: Some extracts (standardized to ~18.75% oligomeric procyanidins) employed ~300 mg daily as the minimum effective dose, with improvement apparent after 6-8 weeks.
- Doses ranging from 250 to 1,200 mg per day (different extracts) were utilized in hypertension research(23).

Formulation :-

Formulation / Extract	Standardization/ Active Constituent	Dosage Form And Strength	Indication IN Cvds	References
WS® 1442 (Crataegus extract)	17.3-20.1% oligomeric procyanidins (OPCs).	Tablet/Capsule (450 mg twice daily; 900 mg/day)	Mild– moderate chronic heart failure (NYHA II– III)	(24,25).
LI 132	2.2% Flavonoids (as Hyperoside)	Tablet (160– 900 mg/day)	Chronic heart failure, angina	(26).
Crataegus tincture (BHP)	Not standardized.	Tincture (1–2 mL, 3× daily)	Mild heart weakness, hypertension	(27).
Hydroalcoholic dry extract	2% flavonoids, or 18.75% OPCs	Capsule (300–600 mg twice daily)	Hypertension , atherosclerosis	(28).
Crataegus infusion (tea)	Not standardized.	Infusion (1–2 g/150 mL water, 2–3× daily)	Functional cardiac disorders, hypertension	(28).
Crataegus + Leonurus cardiaca	Not standardized.	Capsule (250 mg each extract)	Cardiotonic, mild arrhythmia	(29).
Crataegus + Coenzyme Q10	–	Capsule (450 mg + 30 mg CoQ10)	Cardiac insufficiency, ischemia	(30).
Experimental nanoformulation	Polyphenolrich extract.	Nanocapsule (100–200 mg/day, preclinical)	Endothelial dysfunction, oxidative stress	(31).

Characteristics of Arjuna :-**ARJUNA :-**

- Arjuna (*Terminalia arjuna*) is an Ayurvedic herb used for cardiovascular disease (CVDs) The plant known as Arjuna, or *Terminalia arjuna*, belongs to the *Combretaceae* family.
- It includes active chemicals such tannins, flavonoids, and triterpenoids, which have antioxidant, anti-ischemic, and hypotensive properties.



Figure No. 6.2 : Arjuna

Morphological Characteristics of Arjuna (*Terminalia arjuna*)

- Common Names : *Terminalia Arjuna* Roxb. Ex DC
- > Family : *Combretaceae*.
- Leaves : Simple, opposite or sub-opposite, oblong or elliptic, 10-15 cm long by 5-8 cm wide, coriaceous (leathery) texture, upper surface dark green and lustrous, under surface pale and dull, stipules small and caducous

Geographical classification:-

- *Terminalia arjuna* is native to India and the adjacent South Asian nations.
- It is commonly found near riverbanks, streams, and dry riverbeds in tropical and subtropical climates.
Countries of Occurrence:
- India
- Sri Lanka

**Figure No. 2.2 : Arjuna (Steam Bark)****Taxonomical Classification (20) :-**

Kingdom	Plantae
Subkingdom	Tracheobionta – Vascular plants
Superdivision	Spermatophyta – Seed plants
Division	Magnoliophyta – Flowering plant
Class	Magnoliopsida – Dicotyledons
Order	Myrtales
Family	<i>Combretaceae</i>
Genus	<i>Terminalia</i>
Species	<i>Terminalia arjuna</i> (Roxb.) Wight & Arn

Chemical Constituents:-

- The dried bark from the stem contains approximately 20 to 24% tannin, but the bark from the lower branches contains up to 15 to 18%
- The tannins claimed to be present include (+) catechol, (+) gallic acid, (+) gallo catechol, epigallocatechol, and ellagic acid. Flavonoids found in the stem bark include arjunolone, arjunone, and baicalein(32)
- Tannins are also present in the fruits at levels ranging from 7 to 20%. The fruits include hentriacontane, myristyl oleate, and arachidic stearate, as well as a pentacyclic triterpenic glycoside called arjunoglucoside III(33)

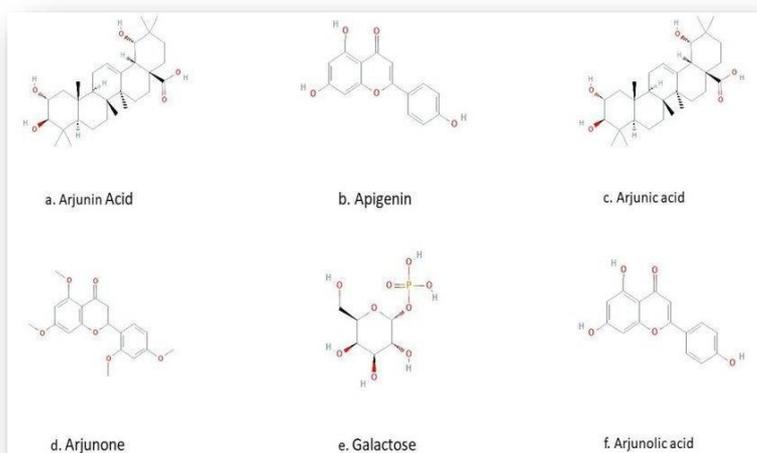


Figure No. 2.3 : chemical Structure of Arjuna

Mode of Action :-

- Terminalia arjuna (Arjuna) has cardioprotective properties through many methods. It serves as a positive inotropic agent, boosting heart contractility without raising oxygen demand.
- Anti-platelet and myocardial protective properties reduce platelet aggregation, ischemia damage, and apoptosis in cardiac tissues(34).

Uses of Arjuna :-

- Heart failure: Improves cardiac contractility and alleviates symptoms such as tiredness and dyspnea.
- Hypertension: mild antihypertensive effects due to vasodilation and improved endothelial function.
- Anti-platelet activity: Lowers platelet aggregation and thrombosis risk.
- Anti-inflammatory effects: Effective in cases of oxidative stress-mediated inflammation(35).

Dosage of Administration :-

- The recommended dosage for Terminalia arjuna (Arjuna) is 3-6 g of dried bark powder daily as a decoction or infusion.
- 250-500 mg of a standardized hydroalcoholic bark extract, 2-3 times daily, for 8-12 weeks in patients with chronic heart failure.

Formulation :-

Formulation	Preparation/ Extract Type	Dosage	Indication	Reference
Crude bark powder	Dry powder, decoction, or infusion.	3–6 g/day	General cardiotoxic, moderate heart failure, and angina	(37).
Hydroalcoholic extract	50-70% ethanol extract, standardized (for example, 20% arjunolic acid)	250–500 mg, 2–3 times daily	Chronic heart failure, ischemic heart disease, and hyperlipidemia	(38).
Capsules / Tablets	Standardized extract (60-70% ethanol or aqueous-alcoholic)	250–500 mg, 2–3 times daily	Heart failure, angina, and hypertension	(39).
Decoction / Infusion	Boiled in water (1:10 w/v).	1–2 cups/day	Cardioprotective; mild hypertension.	(40).
Combination formulations	capsules/tablets containing standardized Arjuna extract	Varies (250–500mg Arjuna Per dose)	Cardiovascular support and lipid-lowering	(41).

CONCLUSION:

Cardiovascular diseases (CVDs) remain a primary cause of death around the world, necessitating the development of innovative and safer therapeutic approaches. Herbal medications such as Hawthorn (*Crataegus* spp.) and Arjuna (*Terminalia arjuna*) have demonstrated outstanding cardioprotective, antioxidant, hypolipidemic, and antihypertensive effects. Because of their high bioactive phytoconstituent content, such as flavonoids, tannins, and triterpenoids, these herbs improve heart function, reduce oxidative stress, lower cholesterol levels, and improve overall cardiovascular health.

The combination of herbal therapy and conventional medicine provides a comprehensive approach to the treatment and prevention of cardiovascular problems. However, standardization, dosage optimization, and clinical validation are required to ensure their safety and efficacy.

To summarize, herbal medications are a viable and natural alternative for cardiovascular disease therapy. When used properly and supported by scientific study, they can make a substantial contribution to worldwide heart health while also effectively complementing modern pharmaceutical treatments.

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