



## A REVIEW ON THE HYPOLIPIDEMIC EFFECT OF HRIDYA MAHAKSHAYA - A CONCEPTUAL STUDY

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## ABSTRACT

According to Ayurveda, Hrudaya, or the heart, is the seat of Buddhi, or the intellect, and Chetana, or consciousness. It has the following three entities: Shareera (physical body), The mind, or manas, and the senses of Indriya. Hrudaya is regarded as a psychosomatic being, highlighting the complex relationship that exists between the heart, mind, and body. Acharya Charaka classified medicinal plants into ten categories, one exclusively focused on cardioprotection and known as Hridhya Mahakashaya. This emphasises the value of herbal treatments in maintaining heart health and preventing coronary artery disease (CAD). All ten medications are Amla Rasa Pradhana (sour taste) and high in vitamin C. Vitamin C is a powerful antioxidant, anti-inflammatory, and stress reliever. The purpose of this article is to present summaries, and the probable method of action of the medications indicated in Hridya Mahakashaya as having a hypolipidemic effect.

**Keywords:** Hrudaya, Buddhi, Amla Rasa, Coronary artery disease, Antioxidant, Anti-inflammatory

## INTRODUCTION

### A) BACKGROUND:

Hyperlipidaemia is a metabolic condition characterized by abnormally high of any or all lipids, including triglycerides, cholesterol, and low-density lipoprotein (LDL-C). Lipids are organic molecules containing fats, waxes, sterols, fat-soluble vitamins (such as vitamins A, D, E, and K), monoglycerides, diglycerides, phospholipids, and others<sup>1</sup> They are nonpolar solvents and insoluble in water, requiring lipoprotein particles to transport them in polar plasma. Lipids are essential for cell membranes, synthesis of steroids, vitamin D, fat-soluble vitamins, and diet due to their high energy value. They can be classified into saponifiable and non-saponifiable lipids.

*Apathya Ahara* (Unhealthy eating habits) such as overeating and consuming *Guru* (heavy), *Madhura* (sweet), *Shita* (cold), and *Snigdha* (oily) foods, coupled with a sedentary lifestyle and lack of physical activity, sleep, and stress management, can lead to imbalances in the body's fat metabolism. *Manda Medodhatvagni* is unable to produce a healthy form of *MEDA*, resulting in an increase in the *Abadhha* form of *Meda*, which again blocks *Medovahasrotasa*. This state propagates poor tissue metabolism, leading to different *Medoroga*. This imbalance can result in various metabolic disorders like high cholesterol, high blood pressure, fatty liver, and diabetes.

### B) JUSTIFICATION:

Hyperlipidaemia is strongly linked to cardiovascular diseases (CVDs) and is a major risk factor for coronary artery disease (CAD), contributing to atherosclerosis. Undoubtedly, Inflammatory and immunological responses play a role in this process. People with hyperlipidaemia are approximately twice as likely to develop cardiovascular disease (CVD) as those with normal total cholesterol levels. India leads the world in the quantity of people suffering from coronary artery disease (CAD). CVD is the primary cause of adult mortality in the United States<sup>2</sup>. Risk factors for

CVDs include alcohol, tobacco, unhealthy diet, sedentary lifestyle, high blood pressure, hyperglycaemia, hyperlipidaemia, and obesity<sup>3</sup>.

Different cholesterol-lowering medications have varying effects on cholesterol profile and side effects. Lipoprotein modifying medications include nicotinic acid, fibric acid derivatives, cholesterol absorption inhibitors, HMG CoA reductase inhibitors (statins), PCSK9 inhibitors and others, but their long-term benefits in preventing heart attacks and strokes are limited due to potential side effects so, it's necessary to find alternative medicine.

Many studies in the field of hyperlipidaemia have been conducted in the past using *Sthoulyarogadhikara* medication. But many people nowadays have high blood cholesterol levels found in their blood, even though they have a modest BMI and no symptoms of *Sthoulya* (obesity). Thus, the patient faces a significant obstacle. The goal of this research is to evaluate the hypolipidemic effect of Acharya Charaka's cardioprotective 10 medications, known as "*Hridyamahakashaya*," in order to prevent cardiovascular disease.

### METHODOLOGY:

#### SELECTION OF DRUG:

*Acharya* states that increased *Kapha Dosh*a with *Vata Dosh*a is important for *Medoroga*, which in turn decreases *Agni* (digestive fire) and converts *Annarasa* (Food) into *Aama* (intermediate product). The *Doshas* of *Kapha*, *Vata*, *Meda*, and *Mamsa* are the most commonly impacted by Hyperlipidaemia. Later on, all of these factors contribute to the development of these kinds of cardiovascular issues. Thus, *Hridya Mahakashaya* has been selected for the current study from *Agniveshakruta Charak Samhita*<sup>4</sup> whereby 10 particular drugs were given as *Mahakashaya* with a focus on cardiovascular disease.

**Ingredients of *Hridhya MahaKashaya*:** *Amra*, *Amrataka*, *Lakucha*, *Karmarda*, *Vrikshamla*, *Amlavetas*, *Kuvala*, *Badar*, *Dadim*, *Matalunga*

## DETAIL STUDY ON PROPERTIES OF INGREDIENTS AND ITS HYPOLIPIDEMIC EFFECT:

### 1) AMRA<sup>5</sup>

**Latin name:** Mangifera indica linn.

**Family:** Anacardiaceae

**English name:** Mango

**Vernacular name:** Hindi: Aam, Gujarati: Aambo, kerī, Bengali:

Aam Telugu: Mamidichhetu

**Synonyms:** Rasala, Chuta, Sahakara, Pikavallabha

**Part use:** Fruit, Flowers, Seeds oil, Leaves, Stem bark

**Rasa:** Kashaya, Amla **Guna:** Ruchikaraka

**Virya:** Ruksha, Guru **Vipaka:** Amla

**Doshaghnata:** Vata- Pitta kara

**Karma:** Grahi

### CHEMICAL CONSTITUTION<sup>6</sup>:

**Fruit:** Excess amount of **vitamin- A, B and D. Citric acid** and **Gallic acid** in less amount. Epicatechin,  $\beta$  carotene,  $\alpha$ - xanthophyll, Citric acid, Ellagic acid, **Malic acid**, m-trigallic acids, Riboflavin

**Flower:** Aliphatic and aromatic esters of gallic acids, D – arabinose, Glucose, Galactose Pericarp oil: Isoamyl alcohol,  $\alpha$  –and  $\beta$  –pinenes myrcene, Limonene and Fenchone

**Seed oil:** Methyl alcohol, Propyl alcohol, Isopropyl alcohol, Butyl alcohol, Isoamyl alcohol.

**Leaves:** Citronellal, Diterpene, Gerananiol, Limonene, Mangiterol, Mangiferone, Nerol, Nerylacetate,  $\alpha$  and  $\beta$  pinene, Tannin, Chinomin, Methylchinomin, Isochinomin, Hyperin, Friedelin, Lupeol Taraxerol, Taraxerone, Leucine, Tyrosine, Valine

**Stem bark:** Butin, Fisetin Root bark:  $\alpha$  and  $\beta$  amyrins, Cycloartinol, Friedelan-3 $\beta$ -ol, Mangiferonic acid

**Resin:** Mangiferolic acid, Hydroxymangiferonic acids, Erythrodiol, Oleanolic aldehyde

**PHARMACOLOGY ACTIVITY:**<sup>7</sup> Anti-bacterial, Anti-fungal, Anti-viral, **Antioxidant**, Antipyretic, Ant amoebic, Coagulase Anti plasmodial, **Hypoglycaemic**, Diuretic

### 2. AMRATAKA<sup>8</sup>

**Latin name:** Spondias mangifera wild.

**Family:** Anacardiaceae

**English name:** Indian Hog plum

**Vernacular name:** Hindi: Ambara, Amara, Bengali: Aamra, Assamese: Amor

**Synonym:** Pitana, Kapitana, Markatamra, Amrata

**Part use:** Fruit, Essential oil

**Rasa:** Amla **Guna:** Ruchikaraka, Saraka

**Virya:** Ushna **Vipaka:** Madhura

**Doshaghnata:** Vatanashaka, Raktapittashamaka

**Karma:** Grahi

**Rogaghnata:** Atisara, Raktapitta

### CHEMICAL CONSTITUTION:

**Fruit:** contain **gallic acid** (0.75 mg/g of extract) and quercetin (0.08 mg/g of extract), ellagic acid, p-coumaric acid, quercetin, among others.<sup>9</sup>**Essential oil:** rich in aliphatic alcohols (39.42%), monoterpene hydrocarbons (29.62%), and aromatics (22.03%), with furfural (17.14%),  $\alpha$ -terpineol (13.09%), **benzoic acid**, ethyl ester (9.05%), methyl salicylate (5.88%), and  $\gamma$ -terpineol (5.55%) as the main components<sup>10</sup>



**PHARMACOLOGY ACTIVITY:** Anti cancerous, **Antioxidant**

**3. LAKUCHA<sup>11</sup>**

**Latin name:** Artocarpus lakoocha Roxb

**Family:** Moraceae

**English name:** Monkey Jack

**Vernacular name:** Hindi: Badahara Dahu Dahua, Bengali: Dahu

Dephal, Assamese: Bohot, Kannad: Esuluhuli Lakucha

**Synonym:** *Khudrapanasa, Likucha, Dahu*

**Part use:** Fruit, Bark

**Rasa:** Madhura, Amla

**Guna:** Fruit: Guru, Rochaka Beeja:

*Virechaka*

**Virya:** Ushna

**Vipaka:** Amla

**Doshagnata:** Tridosahara

**Karma:** Ruchya, Vishtabdhakaraka, Vrushya

**Rogagnata:** Hridaroga, Klaibya

**CHEMICAL CONSTITUTION:**<sup>12</sup>

**Fruit:** It contains a significant number of macro- and microminerals such as calcium (66.6 mg), magnesium (23.6 mg), potassium (350 mg), phosphorus (22.1 mg), iron (778 µg), zinc (3981 µg), copper (7974 µg), manganese (2025 µg) and **vitamin C** and carotene.

**Bark:** Tennin (8.5%)

**PHARMACOLOGY ACTIVITY:** **Antioxidant**, antibacterial, antidiarrheal, **anti-inflammatory**, analgesic, antinociceptive, schistosomicidal, **hepatoprotective**, neuroprotective, cytotoxic, antiglycation, and **anti-cholesterol**, and can also be used for anti-aging and wound healing.



**4. KARMARDA<sup>13</sup>**

**Latin name:** Carissa carandas linn.

**Family:** Apocynaceae

**English name:** Bengal currant

**Vernacular name:** Hindi: Karonda, Gujarati: Karamda, Bengali:

Karamcha, Telugu: Vaka

**Synonym:** *Sushena, Krushnapakaphala, Karmarda*

**Part use:** Fruit

**Rasa:** Amla

**Guna:** Guru

**Virya:** Ushna

**Vipaka:** Amla

**Doshagnata:** Vata-pitta Shamaka

**Karma:** Fruit- Ruchijanaka Roots- Vamaka, Mutrajanaka

**Rogagnata:** Trushna, Raktapitta, Hridaroga

**CHEMICAL CONSTITUTION:**<sup>14</sup>

**Fruit:** Fruits are a rich source of iron and an excellent source of **vitamin A, C, and B complex**, fibre, carbohydrates, and minerals such as calcium, phosphorous, potassium, sodium, and sulphur.

**PHARMACOLOGY ACTIVITY:** **Anti-inflammatory**, antipyretic, **antioxidant**, anticancer, antidiabetic



## 5. VRUKSHAMLA<sup>15</sup>

**Latin name:** *Garcinia indica* Choisy

**Family:** Guttiferae

**English name:** Kokam butter tree

**Vernacular name:** Hindi: Kokam, Marathi: Amasula, Gujarati: Kokam, Bengali: *Kheer*

**Synonym:** *Ratambi, Tinditaka, Chukra, Amlavrukshaka*

**Part use:** Fruit

**Rasa:** *Amla, Katu, Kashaya*      **Guna:** *Ruksha*

**Virya:** *Ushna*      **Vipaka:** *Katu*

**Doshagnata:** *Vatakaphanashaka, Raktapittaprashamana*

**Karma:** *Grahi, Rochaka, Agnidipaka*

**Rogagnata:** *Arsha, Hradaroga, Gulma, Shoola, Atisara*

**CHEMICAL CONSTITUTION:**

**Fruit:** Fruits are a rich source of **Hydroxycitric acid (HCA)**: [This compound is associated with weight loss properties.](#) **Maleic acid, Garcinol** act as antioxidant, **Isogarcinol, Xanthochymol** and **Isoxanthochymo**.<sup>16</sup>

**PHARMACOLOGY ACTIVITY:** **antioxidant, anti-obesity, anti-arthritic, anti-inflammatory, antibacterial, hepatoprotective, cardioprotective, antidepressant and anxiolytic effects.**<sup>17</sup>



## 6. AMLAVETAS<sup>18</sup>

**Latin name:** *Garcinia pedunculata* Roxb.

**Family:** Guttiferae

**English name:** *Garcinia*

**Vernacular name:** Hindi: Aamlavetasa, Assamese: Thekera, Bengali: Thoikor

**Synonym:** *Chukra, Shatavedhi, Sahastanuta*

**Part use:** Fruit

**Rasa:** *Atyanta Amla;*      **Guna:** *Laghu, Ruksha.*

**Virya:** *Ushna ;*      **Vipaka:** *Katu*

**Doshagnata:** *Vatashleshmahara, Pittajanaka*

**Karma:** *Malabhedaka, Agnidipak*

**Rogagnata:** *Hridaroga, Pliha, Ajirna, Gulma, Swasa, Kasa, Hikka, Shoola, Udavarta*

**CHEMICAL CONSTITUTION:**<sup>19</sup>

**Plant:** polyphenols, flavonoids along with bioactive components like **hydroxycitric acid**.

**PHARMACOLOGY ACTIVITY:** **antioxidant, antibacterial, antifungal, anthelmintic, hypolipidemic, antidiabetic, hepatoprotective, neuroprotective, and nephroprotective properties.**



### 7. KUALA<sup>20</sup>

**Latin name:** Ziziphus sativa Gaerth.

**Family:** Rhamnaceae

**English name:** Indian Jujube

**Vernacular name:** Hindi: Ber, Gujarati: Mota bora, Assamese: Bogari, Telugu: Yellande

**Synonym:** Rajabadara, Souvira, Ghonta, Phenila

**Part use:** Fruit

**Rasa:** Madhura

**Guna:** Guru

**Virya:** Sheeta

**Vipaka:** Madhura

**Doshagnata:** Rakta- Pittahara

**Karma:** Shukrajanaka, Brumhana, Malabhedaka

**Rogagnata:** Kshya, Trushna, Daha

**CHEMICAL CONSTITUTION:**<sup>21</sup>

**Plant:** Flavonoids, alkaloids and saponins are the main phytochemicals.



**PHARMACOLOGY ACTIVITY:** anti-hyperglycaemic, anti-hyperlipidaemic and anti- hypertension. Z. vulgaris has recently been shown to have antibacterial, antioxidant, and sedative activities.

### 7. BADARA<sup>22</sup>

**Latin name:** Ziziphus jujuba linn.

**Family:** Rhamnaceae

**English name:** Plum

**Vernacular name:** Hindi: Bahara, Gujarati: Bira, Marathi: Boriche, Telugu: Regu chettu

**Synonym:** Kola, Badara

**Part use:** Fruit

**Rasa:** Madhura

**Guna:** Guru, Saraka

**Virya:** Ushna

**Vipaka:** Madhura

**Doshagnata:** Kapha-Pittajanaka, Vatanashaka

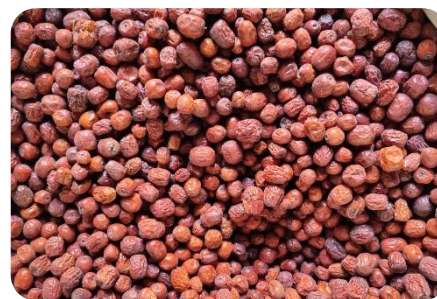
**Karma:** Amapachaka, Raktashodhaka, Raktastambhaka, Rochaka

**Rogagnata:** Hridhya, Udardaprashamana

**CHEMICAL CONSTITUTION:**<sup>23</sup>

**Fruit:** Chemical constituents in fruit such as polysaccharides, polyphenols, amino acids, nucleotides, fatty acids, dietary fibre, and alkaloids

**Seeds:** catechin, monofluoride, and procyanidin B4



**PHARMACOLOGY ACTIVITY:** antiallergenic, anti-inflammatory, analgesic, anti-hyperglycaemic, anti-hypercholesterolemic, central nervous system depressant, immune stimulation, and platelet aggregation activities

## 8. DADIMA<sup>24</sup>

**Latin name:** Punica granatum linn.

**Family:** Punicaceae

**English name:** Pomegranate

**Vernacular name:** Hindi: Anara, Gujarati: Dadama,

Bengali: Dalima, Telugu: Dalimbakaya

**Synonym:** Karaka, Dantabeeja, Lohitapushpaka

**Part use:** Fruit, Seeds, Bark

**Rasa:** Amla, Madhura

**Guna:** Laghu

**Virya:** Sheeta

**Vipaka:** Madhura

**Doshagnata:** Tridoshagna, Raktashodhaka

**Karma:** Krumighna, Shukrajanaka, Grahi, Rochaka, Atisara

**Rogagnata:** Jwara, Hridaroga, Kantharoga

**CHEMICAL CONSTITUTION:**<sup>25</sup>

**Fruit:** It contains 85% water, 10% total sugars, mainly fructose and glucose, and 1.5% pectin, organic acid, such as **ascorbic acid**, **citric acid**, and **malic acid**, and bioactive compounds such as phenolics and **flavonoids**, principally anthocyanins.

**Seeds:** Delphinidin-3-glucoside, cyanidin-3-glucoside, delphinidin-3,5-diglucoside, cyanidin-3,5-diglucoside, pelargonidin-3,5-diglucoside, and pelargonidin-3-glucoside with delphinidin-3,5-diglucoside

**PHARMACOLOGY ACTIVITY:**<sup>26</sup> **antioxidant**, an anticarcinogenic, and an **anti-inflammatory** property

## 9. MATALUNGA<sup>27</sup>

**Latin name:** Citrus medica L.

**Family:** Rutaceae

**English name:** Citron

**Vernacular name:** Hindi: Bijora nimbu, Gujarati: Bijora, Bengali:

Tavalembu, Telugu: Lungumu, Tamila: Madalam

**Synonym:** Beejapura, Ruchaka, Phalapuraka

**Part use:** Fruit, Seeds, Bark

**Rasa:** Amla

**Guna:** Laghu, Snigdha

**Virya:** Ushna

**Vipaka:** Amla

**Doshagnata:** Raktapittahara

**Karma:** Hridhya, Dipana, Aruchinashaka, Shonitasthapana

**Rogagnata:** Swasa, Kasa, Mutrashmari

**CHEMICAL CONSTITUTION:**

**Fruit:** Fruit contains iso-limonene, citral, limonene, phenolics, **flavanones**, **vitamin C**, pectin, linalool, decanal and nonanal.<sup>28</sup>

**Peel:** Peel contains coumarins, scoparone, limettin, scopoletin and umbelliferon<sup>29</sup>.

**PHARMACOLOGY ACTIVITY:**<sup>30</sup> anti-catarthal, capillary protector, **anti-hypertensive**, diuretic, antibacterial, antifungal, anthelmintic, antimicrobial, analgesic, strong **antioxidant**, anti-cancerous, antidiabetic, estrogenic, antiulcer, **cardioprotective** and **antihyperglycemic**.



## DISCUSSION

### PROBABLE HYPOLIPIDEMIC MODE OF ACTION OF HRIDHYA MAHAKASHAYA

Asthayi Medo Dhatu is the circulating form of lipids in the blood, constantly providing nourishment to tissues. It can be likened to lipoproteins like cholesterol and triglycerides, which circulate and supply lipids. It represents the dynamic aspect of lipid metabolism, while Sthayi Medo Dhatu is the stationary, stored form. Hridya term is composed of the trigraph hri+da+ya=hriday. Two significant Srotas (channels or systems) come from the heart (Hridaya): Pranavaha Srotas and Rasavaha Srotas. Medovaha Srotas is crucial for the movement of lipids in the body. Rasa, Rakta plays a role in transporting Medo Dhatu. Hridya Mahakashaya contains Amla rasa (sour taste) fruits which are associated with Pitta dosha in Ayurveda, promoting digestion, metabolism, detoxification, and lowering cholesterol. Treatment for hyperlipidaemia in Ayurveda aims to remove Asthayi medadhatu (excess lipids), balances Kapha- Vata dosha, and improve Jatharagñni, Dhatavagñni and Bhutagni functions. The following composition of sour fruits aids in the management of hyperlipidaemia.

**Vitamin C** enhances insulin sensitivity, reduces insulin resistance, improves hyperlipidaemia, and boosts cardiovascular health. It also neutralizes free radicals, which reduces oxidative stress and the risk of hyperlipidaemia. **Flavonoids:** Antioxidants can decrease cholesterol and LDL by improving blood vessel function and lowering inflammation. **Fiber** can reduce blood levels of low-density lipoproteins (LDLs) by binding to bile acids and preventing reabsorption. **Malic acid** inhibits the absorption of dietary cholesterol in the gut, resulting in lower LDL levels. Additionally, it lowered triglyceride levels by inhibiting the activity of enzymes involved in triglyceride synthesis. Improve blood vessels, which can assist maintain healthy cholesterol levels.

## CONCLUSION

Indian studies show lipid abnormalities like high LDL, non-HDL, triglycerides, and ApoB increase CAD risk. Managing LDL-C and non-HDL-C is key

for prevention.<sup>31</sup> Here, the medications of Hridhya Mahakashaya are abundant in vitamins C, flavonoids, fibre, malic acid, and other nutrients; in particular, they have qualities that decrease triglycerides and LDL-C. At the same time Statins are generally well tolerated and safe, but they can cause liver and muscle damage, which is usually treatable. Statins have been associated with a higher risk of diabetes with new onset. But here the Amlavetasa, Kubal, Badar, and Matalunga are capable of decreasing the hyperglycaemic index. The anti-cholesterol properties of Lakucha, Amlavetasa, Kubal, and Badar; the anti-inflammatory properties of Lakuch, Karmarda, Vrukshamla, Badara, and Dadim; and the hepatoprotective properties of Lakucha, Vrukshamla, and Amlavetasha of Hridhya Mahakashaya functions as a cardioprotective in patients with hyperlipidaemia. This is our concept study; more clinical investigation will be needed to fully comprehend Hridhya Mahakashaya's effectiveness in treating hyperlipidaemia.

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