

# Pharmacology of Cardio Protective Herbal Drugs

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**Abstract**—From early ages plants have been used in allaying the human distress. It is very evident from our ancient texts that use of herbs was very effective back in date also. Medicinal plants have natural bioactive compounds which are known as phytochemicals. These phytochemicals produced from plants, fruits and vegetables function to battle against many diseases. In modern era when everyone is focusing on ayurvedic drugs, there is dire need to scout the plant biodiversity for its medicinal and pharmacological potential. Different parts of plants are used for cardiovascular ailments in different forms. Cardioprotective plants contain bioactive compounds, diosgenin, isoflavones, sulfuraphane, carotized, catechine and quercetin. These compounds help reducing the risk of cardiac abnormalities.

**Index Terms**— Cardioprotective, dravya, cardiovascular, herbal.

## I. INTRODUCTION

Leading cause of deaths across the world are related to either heart attack or myocardial infarction or any other cardiac related complications. Herbal antioxidants are getting increased importance as defensive agents against number of cardiovascular abnormalities. The bioactive agents from natural resources have gained importance in modern system of medicine. By scavenging the free radicle formation for medicinal plants, risk of cardiac ailments can be reduced. There are many pharmacologically important drugs derived from medicinal plants. Use of plant derivative drugs play crucial role in healthcare system around the globe. Ayurvedic drugs help in maintaining proper standard of living along with having properties in managing diseases. Ischemic heart diseases are treated by herbal drugs since long.

Though cardiovascular system was not envisaged by ayurveda in a way in which it is now being studied in present modern medicine. But there are many evidences which prove that even ayurvedic practioners of old times had same basic concept for cardiovascular activities. These reference for circulation are available in samhitas.

The term rasa has been assigned to fluid that is continuously circulating in body. Achaya Charaka introduced 10 dravyas under 'hridya mahakashay' group of drugs. Most of the drugs mentioned in hridya mahakashay are citrus fruits comprising ascorbic acid. Phytoconstituents present in these herbs help to maintain healthy state of blood vessels including coronary arteries. Critical analysis of herbal drugs such as arjuna, pushkarmool, bala, bagbala, shunthi, pippali, yashtimadhu, haridra, dashmooletc indicate that these drugs

possess hypotensive, hypochlostromic, anti-platelet, thrombolytic activities which play pivotal role in management of cardiovascular and cerebrovascular diseases.

## II. MEDICINAL PLANTS WITH CARDIOPROTECTIVE POTENTIAL

There are many plants which are used as cardioprotective drugs. But the phytochemicals which are present in original plant are more efficient and have less side effects than their pharmaceutical derivatives.

Some of the plants that are used as cardioprotective drugs are mentioned :-

Along with mentioned above Dravya's there are many other dravyas like: -Garcinia indica, crataegus oxyacantha, Crataegus oxyacantha, Psidium guajava, hydrocotyle aciatica etc.

## III. CARDIOPROTECTIVE MECHANISM OF MEDICINAL PLANTS

From ages medicinal plants are used for treatment of cardiovascular ailments. These natural plants exert protective therapeutic effect through inhibiting, modulating and regulating the expression of various proteins and glycoproteins, regulating calcium levels and improvement in functioning of mitochondria. The cardioprotective effect of medicinal plants in cardiovascular ailments work by weakening the damaging cardiac muscle cells, vascular smooth muscle cells, endothelial cells, macrophages and microphages.

Cardioprotective drugs work on different cell levels in different way. In cardiomyocytes they work by opening Katp channel. It increases secretion of arterial natriuretic peptide oxidative stress and apoptosis.

In endothelial cells it works, by inflammation inhibition, oxidative stress and apoptosis endothelial permeability suppression. At vascular smooth muscle cell level, they act by inhibition of structural and contractile protein activities and by regulating calcium channels. And in monocytes and macrophages it work as estrogen receptor activator and activator of nuclear receptor peroxisome proliferation activated receptora .

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PLANT NAME	FAMILY	PART USED	DOSAGE FORM	CHEMICAL CONSTITUENTS
<i>Sapthodea campanulata</i>	Bignoiaceae	Bark	Ethanol extract	Saponin, flavonoids, steroids, alkaloids, Glycosides, tannin, phenol, phlobatanin, Terpenoids and anthraquinone
<i>Allium sativum</i>	Liliaceae	Bulb	Garlic oil	Alkaloids, flavonoids, tannins, saponins and cardiac glycosides
<i>Ficus hispida</i>	Moraceae	Leave	Methanol	Sterols, amino acids, protein, carbohydrates, n-triacontanol, lupeol acetate, gluanol, alkaloids, terpenes, saponins, mucilage, flavonoids, phenols
<i>Tribulus terrestris</i>	Zygophyllaceae	Fruits	Aqueous	Flavonol, flavonoids, alkaloids, glycosides and steroidal saponins
<i>Semecarpus anacardium</i>	Anacardiaceae	Dried nuts	Ethanol	Bhilwanols, phenolic compounds, bioflavonoids, sterols, glycosides, anacardoside
<i>Andrographis paniculata</i>	Acanthaceae	Leaves	Methanol	Andrographolide, diterpenoids, flavonoids, quinic acid, xanthones
<i>Crocus sativus</i>	Iridaceae	Flower	Aqueous	Cartenoid compounds, crocetin, crocin, safranal, glucoside, anthocyanins, delphinidin, petunidin
<i>Ocimum sanctum</i>	Lamiaceae	Seeds	Hydroalcohol	Alkaloids, saponins, tannins, steroid, flavonoids, terpenoids
<i>Ocimum asilicum</i>	Lamiaceae	Aerial parts	Ethanol	Flavonoids, phenolic compounds
<i>Moringa oleifera</i>	Moringaceae	Leaves	Hydoalcohol	Tannins, saponins, alkaloids, terpenes, carbohydrates, cardiac glycosides
<i>Lagenaria siceraria</i>	Cucurbitaceae	Fruit	Juice	Sterol, flavonoids, terpenoids and saponins
<i>Picrorhiza kurroa</i>	Scrofulariaceae	Rhizome	Ethanol	Sterols, glycosides, phenolic compounds, cucurbitacins and iridoid glycosides
<i>Croton sparsiflorus</i>	Euphorbiaceae	Leaves	Methanol	Terpenoids, saponins, tannins, phenols, flavonoids, alkaloids
<i>Azadirachta indica</i>	Meliaceae	Aqueous	Leaves	Reducing sugar, tannins, flavonoids, steroids, alkaloids

#### IV. OBSERVATION

Through all research done while writing this article on pharmacology of herbal cardioprotective drugs it was observed that plants can be used in many different ways, ratios and forms for cardiac ailments because of their phytochemical constituents and their pharmacological activities. But till now exact molecular mechanisms remain unclear about working of these plants. Phytoconstituents of these drugs exert cardioprotective potential by suppressing specific factors, scavenging the free radicle and inhibiting the key enzyme. Even from our samhitas it is clear that our acharayas have mentioned ayurvedic cardioprotective drugs according to their raspanchak properties. While in modern medicine system these raspanchak properties can be co related to their phytochemical constituents because they are deciding factors behind working of any drugs on cellular levels just as raspanchak properties play important role in use of herbal drugs for diseases.

#### V. RESULT

There are vivid evidences about use of medicinal plants for their cardioprotective, hypolipidemic, antianginal, fibrinolytic, thrombolytic, antiplatelet and hypotensive activities. But none of the drugs are subjected to different phases of trials to demonstrate their clinical utility. And no attempts are made so far to illustrate the efficacy of ayurvedic drugs with co-relation to their doshas. There is dire need for more and more clinical studies to get use of these natural drugs in future because ayurvedic drugs not only prevent ailments but also help in maintaining proper health.

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