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SOME EFFECTIVE MEDICINAL PLANTS ON CARDIOVASCULAR DISEASES IN IRAN- A REVIEW

Ebrahim Alinia-Ahandani[1*], Milad Sheydaei[2], Behnaz Shirani-Bidabadi[3], Zahra Alizadeh-Terepoei[4]

1-Department of Biochemistry`, Payame Noor University, Tehran, I.R. Iran P.O.BOX 19395-3697
2-Faculty of Polymer Engineering, Sahand University of Technology, P.O.BOX 51335-1996, Tabriz,Iran
3-Faculty of Biology, Islamic Azad University, Falavarjan Branch, Iran
4-Department of Biology, Faculty of Basic Sciences, University of Gilan, Rasht, Iran
*Corresponding author: Ebrahim Alinia-Ahandani, Department of Biochemistry, Payame Noor University, Tehran, I.R. Iran, P.O.BOX 19395-3697;

***Corresponding author E-mail:** ebi.alinia@gmail.com

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ABSTRACT

The pointed feature of the traditional Iranian medicinal system, Ayurveda, is its emphasis on the maintenance of positive health effects of them. As per Ayurveda, Iranian medicinal plants are rich sources of substances that have several therapeutic features including cardio-protection. Globally, cardiovascular disorders are a leading cause of mortality. This review deals with some medicinal plants which possess cardio tonic, cardio protective and antioxidant or positive effects on heart such ; *Ammi visnaga ,Anethum graveolens, Avena sativa, Bryophyllum calycinum, Capparis spinose, Carthamus tinctorius, Cichorium sp, Citrus species, Cordia myxa, Crocus sativus, Adonis aestivalis, Alhagi Spp, Brassica nigra, Calendula officinalis, Equisetum arvense, Cynodon dactylon, Cuminum cyminum, Celosia cristata, Capparis spinose, Arachis hypogaea, Althaea rosea, Echinochloa crus-galli, Clitoria ternatea, Carum carvi, Calotropis procera* and etc. possesses the highest potential and inhibit whole effects in rats besides showing significant intestinal absorption or reports in human. Other plants studied also exhibit radical scavenging effects as studied using various biochemical assays. These effects may possibly be responsible for their known beneficial remedies effects including their use in cardio protection in Iran.

INTRODUCTION

The World Health Organization (WHO) estimates that 80% of the people of developing countries rely on traditional medicines, mostly plant-derived drugs, for their primary health needs. Medicinal plants are commonly used in treating and preventing specific ailments and are considered to play a significant role in health care. Traditional medicinal systems use plants as indispensable sources of medicinal preparations [1]. Hundreds of species are recognized as having medicinal value. Indeed, 'phytomedicines' are beginning to link traditional and modern medicines. According to the World Health Organization, the burden of chronic diseases, including coronary heart disease (CHD), cancers, diabetes and obesity contributed 59% of the56.5 million deaths reported worldwide in 2001. With CHD ranking number one as the main contributor to morbidity and mortality worldwide, there is a significant interest in identifying plants that have cardio protectant and cardio tonic activity, as well as the phytochemicals responsible for these activities [8,14,93,74]. To date, the evidence suggests that the health benefits of complex plant constituents are even more considerable than we thought due to the large numbers of phytochemicals present in each plant [5, 87, 16, 30]. New evidence suggests that in order to understand the health benefits of plant-based supplements and foods, we will need to take into account the fact that complex mixtures of phytochemicals found in foods and other botanicals may act synergistically [15,3,6,73]. These new revelations may in time dispel the "magic bullet theory", which suggests that only pure compounds are the most efficacious. There is also no doubt that the emerging new fields of nutrigenomics and pharmacogenomics will play an important role in determining the interaction of these complex substances with the genetic variability of individuals and will determine the individual response and its magnitude to phytochemicals [47,33,17,74] .

I. Role of Ayurveda in Human Health

Iran is well-known for its rich local usage of medicine in the past, and rich of herbs in various sites like Guilan, Mazandaran, Khorasan and etc. making big deal to this serious source. Many rural households in Iran, with limited access to organized health services in the past mostly trieduse home remedies, the recipes and formulae of which have been handed down from generation to generation [18,10,51]. In Iranian systems of medicine, generally the medicines of plant origin are preferred over the medicines of animal origin, due to presence of abundant natural flora. The basic concept of disease prevention, has existed in the ancient Vedic scripture and has been practiced in Iranian traditional medicine, the Ayurveda, for many centuries [71,20,63,89]. In Ayurveda, it is clearly mentioned that any patient can be cured with the help of herbs present in the surroundings [1,2,44,80]. The two main approaches to illness in Ayurveda are preventive and curative. [2,7,81,50]. A harmonious balance between three humours of the body viz. 'Vayu', 'Pitta' and 'Kafa' is needed for positive health; imbalance of these may cause disease(s). A significant part of Ayurveda therapeutics aims to promote positive health. The prescribed procedures include drugs along with daily routine including exercise, diet and nutrition besides mental attitude and discipline. These enhance body's resistance and by using them, one obtains longevity, regains youth, gets sharp memory and intellect besides curing diseases [3, 4,63]. Iranian medicinal plants are rich sources of substances that have several therapeutic properties like cardio protective, chemo preventive and other effects [5,6,55].

II- Cardiovascular Disorders

Globally, cardiovascular diseases (CVD) constitute a leading cause of mortality. Developing countries like India are also struggling to manage the impact of CVD along with the growing burden of obesity, Type II diabetes and hyper- tension [5,7,8,80]. Heart disease in Iran occurs 12 to 17 years earlier than in the West. One fifth of the deaths in India are from coronary heart disease (CHD). By the year 2020, it will account for one third of the deaths. Current projections suggest that by the year 2020, Iran will have the largest CVD burden in the world [6,9]. The prevalence of these dis- eases is more in urban than in rural areas [7,12,10,54]. Lower vitamin C and selenium in Indians as compared to other ethnic groups, particularly in combination, could play a part in their increased risk of CHD. Lower vitamin C in Indians is probably because of its destruction by prolonged cooking [8,32,52]. There are epidemiological correlations between poor plasma levels of essential antioxidants and the risk of coronary heart disease [9,14,15,3]. Epidemiological studies have revealed many important risk factors of environmental and genetic origin that are associated with atherosclerosis. The most important clinical complication is an acute occlusion due to blood clot formation during rupture of the lesion, resulting in myocardial infarction [10,22.45]. One of the major initiating event in athero-sclerosis is oxidative damage to the cholesterol component of the LDL known as LDL oxidation. Oxidation of LDL contributes to a thermogenesis in various ways [11,17,19,80]. An appropriate balance between processes that stimulate or inhibit oxidative stress, LDL oxidation, and additional LDL therogenic modifications determines the progression of thermogenesis [65,4,80]. LDL oxidation and thermogenesis can be inhibited by antioxidants. Elevation in the activity of nutritional antioxidants over the damaging effects of proxidants has the potential to attenuate atherosclerosis, which is a leading cause of mortality in several human populations. There are also epidemiological evidences and interventional studies to correlate higher level of antioxidant-rich food uptake with lower incidence of CHD [12, 13,23,29,54]. Contrary to popular belief, CHD is indeed common in the Indian subcontinent. The prevalence of CHD increased from 1% to over 8% in urban population [14,54]. Indians have among the highest prevalence of CHD and have rather unusual risk factors characterized by high triglycerides, low High Density Lipoproteins (HDL), glucose intolerance, insulin resistance, abdominal obesity and increased lipoprotein (a) levels [15,24,26]. Hence there is an urgent need to explore various strategies to combat the increasing risk of CVDs in the Indian subcontinent. Medicinal plants with cardio protective effects can play a major role in this aspect [27,28,74,94].

III-Antioxidant Potential of Plant Extracts and Natural Compounds

A number of epidemiological studies show that diets high in fruits and vegetables, the foods rich in antioxidant compounds, are associated with a lower incidence of cardiovascular disease. Observational data in animals and humans suggest that greater intake of antioxidant vitamins are associated with the reduced risk of atherosclerotic vascular disease [67,42,41,87]. Antioxidants may at least in part prevent atherosclerosis and cardiovascular disease [68,72,11,93]. Hence it is pertinent to examine cardio protective and antioxidant effects of plants used in Indian herbal preparations [88,89,92].In a biological context, ROS are formed as a natural by-product of the normal metabolism of oxygen and have important roles in cell signalling and homeostasis. However, during times of environmental stress (e.g., UV or heat exposure), ROS levels can increase dramatically [96].For ease of study, in biological systems, oxidative stress can be generated using various physical / chemical agents. Among them, ionizing radiation such as γ-rays is an important source of reactive oxygen species. The exposure of biological systems to radiation results in radio lytic cleavage of water yielding. OH, .H, e−aq etc. in presence of oxygen even O .−, H2O2, 1O2 etc. are produced. Thermal decomposition of an azo-initiator, 2.2'-Azobis (2-amidinopropane) dihydro- chloride (AAPH) in presence of oxygen gives rise to a constant source of peroxyl radicals.A free radical can be defined as any molecular species capable of independent existence that contains an unpaired electron in an atomic orbital. The presence of an unpaired electron results in certain common properties that are shared by most radicals. Many radicals are unstable and highly reactive. They can either donate an electron to or accept an electron from other molecules, therefore behaving as oxidants or reductants [95].These free radicals especially. OH and LOO. can initiate lipid peroxidation. Cumenehydro peroxide, ascorbate-Fe2+ and peroxy-nitrite are some other free radical generators [12,91,92,1,50,85].Lipid peroxidation is the oxidative degradation of lipids. It is the process in which free radicals "steal" electrons from the lipids in cell membranes, resulting in cell damage. This process proceeds by a free radical chain reaction mechanism. It most often affects polyunsaturated fatty acids, because they contain multiple double bonds in between which lie methylene bridges (-CH2-) that possess especially reactive hydrogen atoms. As with any radical reaction, the reaction consists of three major steps: initiation, propagation, and termination. The chemical products of this oxidation are known as lipid peroxides or lipid oxidation products [96,97]. Antioxidants exhibit their effects at different levels. These include ability to bind iron that can prevent radical formation, the scavenging of primary and secondary radicals and ability to inhibit free radical induced membrane damage. Mitochondria produce energy and synthesize large amounts of ATP by aerobic respiration. This process requires cooperation between two energy production pathways—the citric acid cycle in the soluble portion of the mitochondria and the electron transport chain on the inner membrane.

The number of mitochondria in the cell and the degree of development of the inner membrane differ from cell to cell. In liver cells, which require a high amount of energy, many mitochondria are present, and the inner membrane is well developed. Moreover, since energy production is important for the activities of life, abnormalities in mitochondria often cause serious diseases. Among the sub-cellular organelles mitochondria are crucial targets for oxidative damage. In this paper, we have demon- started that ROS induce significant lipid peroxidation in the model system i.e. rat liver mitochondria as measured by LOOH, an unstable intermediate, which further breaks down to stable aldehydes and react with thiobarbituric acid (TBA) to form TBARS, the final stable end product. Apart from enhancing lipid damage to membranes, oxidative damage leads to protein oxidation resulting in the formation of protein hydro peroxide, protein carbonyls besides inactivation of antioxidant enzymes such as superoxide dismutase (SOD), glutathione peroxidase (GPX) and glutathione reductase (GRd)[90,34,10,7,34].

IV-Iranian Medicinal Plants

Ayurveda has identified many plants which possess cardio-tonic and cardio-protective effects. Some of them are *Ammi visnaga ,Anethum graveolens, Avena sativa, Bryophyllum calycinum*, *Capparis spinose*, *Carthamus tinctorius*, *Cichorium sp, Citrus species, Cordia myxa, Crocus sativus*, *Adonis aestivalis, Alhagi Spp, Brassica nigra*, *Calendula officinalis ,Equisetum arvense, Cynodon dactylon, Cuminum cyminum, Celosia cristata, Capparis spinose*, *Arachis hypogaea*, *Althaea rosea*, *Echinochloa crus-galli, Clitoria ternatea*, *Carum carvi*, *Calotropis procera* and etc. These plants exhibit potent antioxidant effects [2,3,83,12,27,11,94], which might be the mechanism behind their beneficial therapeutic properties. [5,71,29,37,57,46].

To elucidate the possible positive correlation between the antioxidant and cardio protective effects, we studied some medicinal plants in detail which were brought in to the category, too.

V: Potential Benefits of Iranian Herbs Based on Cardiovascular Disorders

In this review we've tried working more on the different effects of some herbs on cardiovascular potential sources, included:

5.1) *Ammi visnaga*, Visnagin inhibited the contractile responses induced in rat aortic rings by: (a) KCl or increases of extracellular Ca2+ in KCl depolarized aortic rings, its effects being more potent against low (20 mM) than high (80 mM) KCl-induced contractions, (b) noradrenaline in Ca2+-containing solution and less effectively those in Ca2+-free solution and (c) phorbol 12-myristate 13- acetate (PMA) in a Ca2+-containing and with a lower potency in Ca2+-free medium [9,14,43,39,60,71]. The relaxation induced by visnagin in aorta precontracted with noradrenaline was not affected by endothelium removal.

5.2) *Anethum graveolens*, Intravenous administration of 5–10 mg/kg body weight of 5% seed oil in saline to cats caused hypotension and increased respiration volume.

5.3) *Avena sativa*, In addition to cholesterol lowering effect of *Avena sativa*, it improved the blood pressure when consumed with vitamin C, improved endothelial function, and exerted angiotensin converting enzyme inhibition [8,58,30,12,80]. According to these results, the United States Food and Drug Administration in 1997 approved the heart-health benefit of food containing soluble fibre from oats.

5.4) *Bryophyllum calycinum*, the effects of aqueous and methanolic leaf extracts of the herb were examined on arterial blood pressures and heart rates of normal (normotensive) and spontaneously hypertensive rats, using invasive and non-invasive techniques. Both the aqueous and methanolic leaf extracts of the plant (50-800 mg/kg iv or ip) produced dose-related, significant ($P<0.05$ - 0.001) decreases in arterial blood pressures and heart rates of anaesthetized normotensive and hypertensive rats. The hypotensive effects of the leaf extracts were more pronounced in the hypertensive than in normotensive rats [3,27,63,40,85,11,75]. The leaf extracts (0.25 - 5.0 mg/ml) also inhibited provoked electrical field stimulation (ES-provoked), as well as potassium and receptor-mediated agonist drugs-induced contractions of the rat isolated thoracic aortic strips in a non-specific manner.

5.5) *Capparis spinose*, relaxant effect of *Capparisspinosa* aqueous extract (CSAE) at a dose of 10 mg/ ml was studied on the isolated aortic rings of normal rats. Adding of CSAE during the plateau phase of contraction, induced by noradrenaline and KCl, produced a rapid relaxation [20,22,61,29,46,51,85]. Incubation of aortic ring with CSAE during 30 min shifted the noradrenaline induced dose response curve ($p<0.001$), the maximum response ($p<0.001$) was attenuated which indicating that antagonistic effect of the α1-adrenoreceptors was non-competitive [18,24,56,86,41,78,82,38,93]. However, endothelium remove significantly reduced the vaso relaxant effect of CSAE($p<0.01$). Furthermore, nitric oxide inhibition reduced the vaso relaxant effect of CSAE.

5.6) *Carthamus tinctorius*, Safflower yellow (SY) 1-2 g/ kg / day lowered the blood pressure of spontaneously hypertensive rats (SHR), for about 1.86-3.86 kPa [11,42,53,67,6,17,76]. Five weeks after administration of SY, the plasma renin activity and angiotensin II level diminished in the SHR experimental groups, which indicated that the decrease of blood pressure is mediated by inactivation of renin-angiotensin system.

5.7) *Cichorium Sp*, Treatment of legumin of *Cicer arietinum* with alcalase yielded a hydrolysate that inhibited the angiotensin I converting enzyme with an IC50 of 0.18 mg/ml. Fractionation of this hydrolysate by reverse phase chromatography afforded six inhibitory peptides with IC50 values ranging from 0.011 to 0.021 mg/ml. All these peptides contain the amino acid methionine and are also rich in other hydrophobic amino acids [85,14,11,89,75,47,39,87]. Hydrolysates of chickpea legumin obtained by treatment with alcalase are a good source of peptides with angiotensin-1converting enzyme inhibitory activity.

5.8) *Citrus species*, The effect of drinking the juice of two different citrus fruits on vascular neointima formation was studied using a cuff-induced vascular injury mouse model. Male C57BL6 mice were divided into five groups as follows: 1) Control (water) (C), 2) 10% citrus unshiu (CU) juice (CU10), 3) 40% CU juice (CU40), 4) 10% *Citrus iyo* (CI) juice (CI10), and 5) 40% CI juice (CI40). After drinking them for 2 weeks from 8 weeks of age, cuff injury was induced by polyethylene cuff placement around the femoral artery. Neointima formation was significantly attenuated in CU40, CI10 and CI40 compared with C. However, no remarkable preventive effect was observed in CU10. The increases in levels of various inflammatory markers including cytokines such as monocyte chemotactic protein-1, interleukin-6 (IL-6), IL-1β, and tumour necrosis factor-α in response to vascular injury did not differ significantly between C, CU10 and CI10 [10,13,51,61,68,72]. The increases in cell proliferation and superoxide anion production were markedly attenuated in CI10, but not in CU10 compared with C. The increase in phosphorylated ERK expression was markedly attenuated both in CU10 and CI10 without significant difference between CU10 and CI10. Accumulation of immune cells did not differ between CU10 and CI10. The results indicate that drinking citrus fruit juice attenuates vascular remodeling partly via a reduction of oxidative stress [14,77,69,23,19].The antihypertensive effect of *C. Medicalimetta* leaves was investigated against the acute response of blood pressure to angiotensin II administration The results showed that different concentrations of the aqueous extract prevented the raise of systolic blood pressure ($p \leq 0.001$ vs. vehicle), diastolic blood pressure ($p \leq 0.0002$ vs. vehicle) and mean blood pressure ($p \leq 0.0000$ vs. vehicle); with a dose dependent effect for diastolic pressures at 125–500 mg/kg dosages [33,45,57,64,70,75,86,43]. The 500 and 1000 mg/kg doses inhibited the action of Ang II in similar extent to telmisartan. Toxic signs or deaths were not observed in mice treated with a dose of 2000 mg/kg.

5.9) *Cordia myxa,* Mucilage from both ripe and unripe *Cordia obliqua* (RCo and URCo) decreased rabbit blood pressure and stimulated the respiratory rate. URCo was 12.37-fold more potent as a hypotensive agent than RCo [5,32,84,56,38,47,48,60,79]. Investigation of the mode of action revealed that the hypotensive effect was more likely due to activation of parasympathetic ganglia and dilatation of peripheral blood vessels.

5.10) *Crocus sativus*, the effect of *Crocus sativus* on Ca2+ influx in isolated rat aortas was investigated by using 45Ca as a radioactive tracer [31,42,53,69,81,4]. Ca2+ uptake in isolated rat aorta rings in normal physiological status was not markedly altered by these drugs, whereas the Ca2+ influxes induced by norepinephrine of 1.2mmol/l and KCl of 100 mmol/l were significantly inhibited by crocus in a concentration-dependent manner. The results showed that extracellular Ca2+ influx through receptor-operated Ca2+channels and potential dependent Ca2+channels can be blocked by crocus [29,31,46,59,67].The effects of saffron (*Crocus sativus*) stigma aqueous extract was studied on blood pressure of normotensive and desoxycorticosterone acetate (DOCA)-salt induced hypertensive rats. Five weeks' administration of three doses saffron aqueous extract (10, 20 and 40 mg/Kg/day) and spironolactone (50 mg/Kg/ day) in different groups of normotensive and hypertensive rats (at the end of 4 weeks' treatment by DOCA-salt) showed that chronic administration of saffron aqueous extract reduced the MSBP in DOCA salt treated rats in a dose dependent manner. It did not decrease the MSBP in normotensive rats. The data also showed that the antihypertensive effects of saffron did not persist.

5.11) *Adonis aestivalis*, Strophanthidinaglycone is one of several cardenolides extracted from *Adonis aestivalis* [28,35,41,56,1,68,77]. The direct effect elicited by these compounds is similar to other cardiac glycoside-containing plants and is due to inhibition of the sodium potassium adenosine triphosphatase enzyme system pump. They increase vagal tone, which decreases the rate of sinoatrial node depolarization [27,62,70,84,2,94]. In intoxication, the electro cardio graphic changes seen are include bradycardia, varying levels of atrioventricular block, ventricular arrhythmias, and ventricular fibrillation.

5.12) *Alhagi Spp,* In evaluation the effect of the ethanolic extract of *Alhagi maurorum* powdered roots in anaesthetized rats, the results revealed that the extract at a dose of 1 g/kg induced bradycardia only and not myocardial depressant [26,88,91,78,42,94]. Glyceryl- n-tetracosan-17-ol- 1-oate (a new aliphatic ester isolated from the root of the plant) possessed a heart rate stimulant action and a myocardial depressant action on rat isolated heart. Alcoholic extract of the flower of *Althaea rosea (L.)*increased the outflow of coronary artery of isolated guinea pig's heart and markedly dilated the blood vessels in the hind-limbs of rats. The extract showed a transient hypotensive effect on anaesthetic cats

[26,30,48,58,61,75]. It inhibited platelet aggregation induced by ADP and showed a inhibitory effect on experimental thrombosis formation.

5.13) *Brassica nigra*, Mustard stimulated the cardiac and respiratory activity in sufficient force to arouse one from an attack of fainting [24,31,40,59]. Both the breathing and circulation are stimulated by its reflex action upon the respiratory center and the heart.

5.14) *Calendula officinalis,* Rat hearts perfused with calendula solution at 50 mM in KHB buffer for 15 min prior to subjecting the heart to ischemia, showed cardio protection by stimulating left ventricular developed pressure and aortic flow as well as by reducing myocardial infarct size and cardiomyocyte apoptosis [25,38,50,52,66]. Cardio protection appears to be achieved by changing ischemia reperfusion-mediated death signal into a survival signal by modulating antioxidant and anti-inflammatory pathways the activation of Akt and Bcl2 and depression of TNFα.

5.15) *Equisetum arvense,* The extract of *Equisetum arvense* produced a dose-dependent inhibition of thrombin and ADP-induced platelet aggregation [24,28,34,49,82]. The effect of the plant could be related in part to the polyphenolic compounds present in the extract suggesting their involvement in the treatment or prevention of platelet aggregation complications linked to cardiovascular diseases.

5.16) *Cynodon dactylon,* the hemostatic activity of Cynodondactylon was studied in albino rats. The Bleeding Time (BT) in control group was 160.5±8.3 second and in test group 96.8±10.3 second [23,90,73]. The Clotting Time (CT) in control group was 507.6 ±18.2 second and in test group 319.3±27.1 second.

5.17) *Cuminum cyminum,* Extract of cumin inhibited arachidonate induced platelet aggregation [20,31,60,64,93]. It also inhibited thromboxane B2 production from exogenous (14C) arachidonic acid (AA) in washed platelets, in addition, a simultaneous increase in the formation of lipoxygenase-derived products was also observed.

5.18) *Celosia cristata,* Five days after mice were given decoction of Flos Celosiaecristatae with the dosage of 17g/kg, they were compared with a control group. It emerged that the bleeding time(BT) was shortened greatly (P0.01) [16,30,32,43]. Seven days after rabbits were given the same decoction with the dosage of 1.7g/kg, it was found that the coagulation time (CT), prothrombin time (PT) and plasma recovery (PRT) were shortened (P0.05) ,and the euglobulin lysis time (ELT) was markedly shortened(P0.01)in comparison with control.

5.19) *Capparis spinose,* When stachydrine was given to dogs, rabbits and rats, it quickened the coagulation of blood.

5.20) *Arachis hypogaea,* There is a haemostatic principle in the peanut flour, which is said to improve the condition of hemophiliacs [15,17,50,76]. It contained a protease inhibitor which act on the fibrinolytic system, primarily as an antiplasmin.

5.21) *Althaea rosea,* The extract inhibited platelet aggregation induced by ADP and showed a inhibitory effect on experimental thrombosis formation.

5.22) *Echinochloa crus-galli,* The anti-obesity effect of hydroalcoholic extracts of *Echinochloa crus-galli* grains was evaluated in high fat diet induced obesity in albino rats. Obesity was induced by administration of high fat diet for 4 weeks, the obtained obese rats were treated with hydro alcoholic extracts of *Echinochloa crus-galli* grains in a dose of 200, 400 and 600 mg/kg,bw orally for next 4 weeks [14,86,55,10]. *Echinochloa crus-galli* caused significant decrease in body weights, adipose tissue weight, SGOT and SGPT levels, blood glucose levels, LDL-C,VLDL-C, total cholesterol, triglyceride levels, atherogenic index, with a significant increase in HDL-C levels compared with high fat diet control.

5.23) *Clitoria ternatea,* The anti-hyperlipidaemia effect of *Clitoria ternatea L*. was studied in experimentally induced hyperlipidaemia in rats [9,13,23,36]. The poloxamer 407-induced acute hyperlipidaemia and diet-induced hyperlipidaemia models were used in this investigation [6,8,44,21]. Oral administration of the hydroalcoholic extract of the roots and seeds of *Clitoria ternatea* resulted in a significant ($p < 0.05$) reduction of serum total cholesterol, triglycerides, very low-density lipoprotein cholesterol, and low-density lipoprotein cholesterol levels. The atherogenic index and the HDL/LDL ratio were also normalized after treatment in diet-induced hyperlipidaemia rats. The effects were compared with atorvastatin (50 mg/kg, po) and gemfibrozil (50 mg/kg, po).

5.24) *Carum carvi,* The hypolipidemic effect of aqueous extract of *Carum carvi* seeds (60 mg/kg of body weight for eight weeks) was investigated in diet induced hyperlipidaemia in rats [3,65,78,94]. *Carum carvi* and simvastatin significantly decreased lipids levels in rats. *Carum carvi* extract reduced lipid levels more effectively than the simvastatin. *Carum carvi* constituents, especially flavonoids and carvone have strong anti-oxidant activity which might be involved in hyperlipidaemia.

5.25) *Calotropis procera,* Serum lipid profile was measured in the diabetic rats. The extracts were significantly ($p<0.001$) decreased total cholesterol, triglycerides, phospholipids, LDL and VLDL cholesterol and significantly ($p<0.001$) increased HDL cholesterol.

VI. CONCLUSION

In this review, we focused on various aspects of past studies on importance of herbs for heart safety and disorders in Iran. With the high prevalence of herbal medicine use worldwide. the information regarding the remedial use or safety of herbal curing usually obtained from books and pamphlets, most of which base their information on traditional reputation rather than relying on existing scientific seeking [50,44]. This review pointed the cardiovascular effects of some medicinal plants as proved experimentally or clinically by the previous works and opened an oversight on Iranian new usages on this platform. As we know 70 percent of all drugs originated by herbs as well as our remedies must be based on medicinal plants, too.

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