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Research Article

PLANTS USED IN COMPLEMENTARY MEDICINE IN THE TREATMENT OF CARDIOVASCULAR DISEASES IN TURKEY

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ABSTRACT. In this study, plants that are used in complementary medicine applications in the treatment of cardiovascular diseases in Turkey have been investigated. The study was carried out in two stages: literature study and fieldwork. As a result of the study, it was determined that 54 plant species belong to 29 families were used as folk medicine in the treatment of cardiovascular diseases. The family which has the most species is Rosaceae (%35). It is followed by Lamiaceae (%17), Scrophulariaceae (%14); Fabaceae and Liliaceae (%10); Berberidaceae, Cornaceae, Orchidaceae, Papaveraceae and Ranunculaceae (%7) and others (%3). The genera which have the most species are Crataegus (%7) and Digitalis (%5). Bioactive compounds found in most of these plants are; phenolic compounds, carotenoids, flavonoids, terpenes, plant organic acids, carotenoids, fatty acid esters, amino acids, furanocoumarins, phenols, anthocyanins, polyphenols and vitamin C. According to the results of the literature and fieldworks, these plants can be used against heart failure, arteriosclerosis, chronic vein diseases; heart strengthener, prevention of cardiovascular diseases, prevents heart palpitation, reduces heart rate and the risk of heart attack. And also vasecenstrieter, vasodilator and vasorelaxant effects were determined. In addition, these plant species have the following effects; antibacterial, anticancer, anti-carcinogenic, anti-inflammatory, antimicrobial, antioxidant, cytotoxic, exhibits antiviral effects, antioxidant activity, free radicals, lipid peroxidation inhibition activity, antioxidant activity a/H3N2. As a result; In this study, the potential of the 54 plant species examined in the treatment of cardiovascular diseases should be examined with detailed researches.

Keywords: *cardiovascular diseases, folk medicine, heart diseases, medicinal plants*

INTRODUCTION

The use of plants in the treatment of various diseases is quite old. At the mummies made in ancient times, some herbal drugs were used figures and inscriptions on medicinal use of plants were reported as well. Some of these forms of use have been accepted by modern medicine and included in the pharmacopoeias of the country. In this context, 6 volumes Turk Pharmacopoeia have been prepared as European Pharmacopoeia Adaptation 2004 and in addition, detailed information about some plants are given in the monographs of the plants used in treatment in our country [1]. However, there are so much plant species that are still used traditionally but not included in pharmacopoeias and monographs [2].

800 000 in the world, there are approximately 12 000 species of plants in Turkey. 1/3 of them are aromatic plants and about 1000 plant species are used in folk medicine [3]. Approximately 1500 plant varieties are allowed to be sold by spices and herbalists by the Ministries of Health and Agriculture. Some of them are natural, 2/3 of them are tropical plants (cloves, ginger, henna, cassia etc.).

Cardiovascular diseases; coronary heart diseases, stroke, rheumatic heart diseases, cerebrovascular disease, peripheral artery disease, hypertensive diseases and arrhythmias; is a group of diseases including all diseases of the heart and blood vessels [4]

Despite all the advances in medicine, cardiovascular diseases remain one of the leading causes of mortality and morbidity worldwide [5]. According to the World Health Organization, it is reported that in 2020, 36% of deaths will occur due to cardiovascular diseases. In Turkey, the number of coronary heart disease over the next 10 years is expected to reach 5.6 million [6]. In terms of ischemic heart and cerebrovascular diseases, these rates are estimated to rise further by 2020-2030 [7].

According to the 18-year follow-up data of the Turkish Cardiology Association Investigation Group's 2008 Turkish Heart Disease and Risk Factors study, the mortality rate due to Coronary heart disease was the first with a share of 40%. According to this study the number of Coronary heart diseases increases by approximately 200 thousand every year [8]. According to the estimates of the Ministry of Health, the population considered as a risk factor for coronary heart disease is predicted to increase by 39.7% through 2023 [9].

Despite having a young population, coronary disease mortality is very high throughout the country [10]. Medical, surgical and interventional treatment methods for cardiovascular diseases require a high cost. Therefore, primary and secondary prevention studies can be emphasized [11]. In primary prevention, the development of controllable risk factors (hypertension, smoking, diabetes, hypercholesterolemia, low HDL cholesterol, high LDL cholesterol, obesity, sedentary life (physical inactivity), stress and alcohol use) should be prevented [12].Uncontrollable risk factors are age, gender and heredity [13]. It is known that there is a close connection between nutrition and health. The role of malnutrition in the formation of cardiovascular diseases is quite high. Researches show that cardiovascular disease-related deaths can be reduced by positive changes in nutrition [14]. Hypertension, arteriosclerosis and related heart diseases are rarely seen or mild in people who are adequately fed with antioxidants. Antioxidants prevent degenerative diseases such as heart, vascular and cancer by reducing the free radical damage caused by metabolism in the body [15]. Some medicinal and aromatic plants with high antioxidant content can be used as a risk reducing or preventive factor in cardiovascular diseases within the scope of complementary and alternative medicine applications.

In this study it is aimed that create a list by determining plants that are used for treatment of heart diseases as complementary and alternative medicine in Turkey conventionally.

MATERIALS AND METHODS

For this purpose, the studies were carried out in two stages. First especially ethno botanical studies in Turkey, pharmacopoeias, monographs and other sources about subject were investigated.

Afterwards, especially in Central and Western Anatolia, with the public interviews, it was tried to determine the plants used among the people within the scope of complementary and alternative medicine applications in the treatment of cardiovascular diseases. As a result of literature studies and fieldworks a list was created about plants that are used for treatment of cardiovascular diseases in public.

RESULTS AND DISCUSSION

As a result of literature and field studies, 54 plant varieties used within the scope of complementary and alternative medicine applications were determined. Name, Bioactive Compounds and Cardiac effects of the plants found are given in Table 1.

Table 1. *Plants used in complementary and alternative medicine applications in the treatment of cardiovascular diseases in Turkey*

Species	Bioactive Compounds	Cardiac effects	References
Adonis aestivalis	carotenoids, fatty acid esters, ricin, cardiac glycoside, alkaloid etc.	heart strengthener	[39, 40]
Adonis annua	glycoside, coumarin, alkaloids etc.	heart strengthener	[41]
Agrimonia eupotaria	amino acids, flavonoids, terpenes, furanocoumarins, phenols, luteolin-7-o-glycoside, hyperoside, apigenin-glycoside, mucilage, tannin, phytosterol etc.	cardiovascular diseases	[42]
Alchemilla vulgaris	pedunculin, agrimoniin, sanguin, castalagin vescalagin, elagitannins, gallic and chlorogenic acids, quercetin, glycoprotein, tannin etc.	heart strengthener	[42, 43]
Ammi visnaga	resin, fixed oil, essential oil, visnagin, meladinin, kellin etc.	vasorelaxant	[39, 44, 40]
Anchusa officinalis	mucilage, resin, mineral salts, oleic acid, linoleic acid, erucite, palmitic and α-linolenic acid etc.	heart strengthener	[42]
Astragalus strictispinis	astragalan, oligosaccharides, polysaccharides, mucilates etc.	heart diseases	[42]
Berberis creticus	berberine, oxyanthine, colombanine, palmatin, berbamine, alkaloids, kelidonic acid, tannin etc.	vasecenstrieter	[42, 45]
Berberis vulgaris	berberine, oxycactine, colombanine, palmatin, berbamine, alkaloids, dyestuff, chelidonic acid, tannin etc.	vasecenstrieter	[40, 46, 47]
Cercis siliquastrum	acylphosphatidylethanolamine, phosphatidylcholine, phosphatidic acid etc.	vasorelaxant	[39, 42]
Cheiranthus cheiri	fixed oil, essential oil, flavon etc.	reduces heart rate	[42, 48]
Cornus sanguine	fixed oil, malic acid, citric acid etc.	vasecenstrieter	[40]
Cornus mas	anthocyanins, flavonoid, polyphenols, monoterpenes, organic acids, vitamin C etc.	vasecenstrieter	[40, 49]

Table 1. *(continued)*

Crataegus coccinea	phenolic compounds, scavenging free radicals etc.	heart diseases	[40, 50, 51]
Crataegus monogyna	phenolic compounds, carotenoids, amine, tannin, hyperositi, vitexin, triterpene, flavon, vitamin P1, vitamin C etc.	heart diseases, atherosclerosis	[40, 51, 52, 53, 54]
Crataegus orientalis	flavonoid, saponin, organic acids, ethereal fats, sugars, sterols, triterpenes, tannins, amines, phenolic acids, biogenic amines, vitamin C etc.	heart diseases, atherosclerosis	[42, 51]
Crataegus tanacetifolia	phenolic compounds, carotenoids, flavonoids, sugars, saponin	cardiovascular	[40, 52, 53]
Digitalis lanata	aglycone, glycone, lanatoside, digoxin and digitalis glycosides etc.	against heart failure, increases contraction of heart muscles and increases heart rate. It is poisonous.	[42, 55]
Digitalis purpurea	glycosides, aglycone, glycone, lanatoside, digoxin, saponin, tannin etc.	heart failure	[42, 55]
Digitalis purpurea var.*alba*	glycoside, digitoxin, gitoxin, saponin, tannin, digitalin etc.	heart diseases	[42, 55]
Ephedra major	tannin, ephedrine, norefedrin etc.	cardiac stimulant	[39, 40]
Fragaria vesca	anthocyanins, cisotanic, flavonoid, tannin, tiriterpene, alkaolot, citric acid, malic acid, sugar, mucilage, vitamin A-B-C etc.	vasecenstrieter	[40, 56, 57]
Fritillaria imperialis	steroidal alkaloids, impericine, forticine, delavine, persicanidine a, imperialine etc.	heart diseases	[42, 48]
Fritillaria pinardii	arachidic, behenic, docosahexaenoic, eicosadienoic, heneicosanoic, linoleic, linolelaidic, myristic, nervonic, oleic, palmiteloic, stearic acids, teroidal alkaloid etc.	heart diseases	[42, 58]
Galanthus elwesii	tramine type protoalkaloids (hordenin and derivatives), homolicorin, lichorin and galanthamin type alkaloids etc.	heart Strengthener	[50]
Glaucium leiocarpum	protopin, sanguinarin, glaucin, fatty acids etc.	reduces heart rate	[42]
Himantoglossum caprinum	glycosides, mucilage etc.	cardiac stimulant	[42]
Inula helenium	helenin, isocostic acid, tomentosin, inhibitorosis, 1,2-longidinone, iso-velleral, methyl ester, quercetin, chiapin B, inulin etc.	vasecenstrieter	[42, 59]
Juniperus communis	glucose, resin, triterpene, phenol derivatives, tannin, pectin, glycoside, juniperin, organic acid, resin etc.	heart failure	[39, 40]

Table 1. *(continued)*

Lavandula stoechas	alpha fenchone, 1,8-sinone, camphor, viridiflorol, murtenyl acetate, alpha-pinene, camphor, 1.8-cineole etc.	arteriosclerosis	[40, 60, 61]
Leonurus cardiaca	flavonoids, terpenes, chlorogenic acid, orientein, quercetin, hyperoside, vitamin P1 etc.	heart rhythm regülatör, vein expander	[42, 62]
Lythrum salicaria	daucosterol, phytol, beta-sitosterol, peucedanin, buntansin, erythrodiol, dodecanoic acid, oleanolic acid, tri-O-methyl-sellagic acid, corosolic acid etc.	vasecenstrieter	[41]
Melilotus officinalis	bisabolone oxide, farnesan, methyl linolenate, squalene, hexahydrofarnesilacetone, β-eudesmol, globulol, coumarin etc.	vasecenstrieter	[42]
Mrytus communis	mirtenyl acetate, 1,8-cineol, α-pinene, linalool, limonene, linalyl acetate, geranyl acetate, α-terpineol etc.	vasecenstrieter	[57, 63]
Olea europaea var. *sativa*	leaves oleuropein, verbascoside, luteolin-7-O-glucoside, apigenin-7-O-glucoside, hydroxytyazole, tyrosol, vanillin, hydroxy-trosol, tyrosol, lignans, oleuropein aglycon, tyrosol; p-coumaric, elenolic, vanilic and p-coumarin acid; vitamin E, A, D, K etc.	cardiovascular	[42, 64]
Orchis masculata	E-ocimene, limonene, 3-hexenyl acetate, linalool, β-terpineol, α-pinene, sabinene, limonene, carvon, p-caryophyllene, p-farnesene, myrsen, glucose, glycomannan, starch, mucilage etc.	heart strengthener	[42, 65]
Papaver somniferum	codeine, morphine, thebaine, papaverine, narcotin omega 3, β-tocopherol; stearic, palmitic, oleic, linoleic, linolenic acids etc.	improves heart health.	[42, 66]
Pelargonium graveolens	citronellol, geraniol, β-citronellol, citronelilformate, geraniol, geranyl, linalool, kaempferol, glycoside, kaempferol, quercetin, kaempferol etc.	vasecenstrieter	[44, 66]
Prunus amygdalus var. *dulcis*	oleic acid (omega 9), linoleic acid (omega 6, LA), palmitic acid, steric acid glycosides, minerals, sterolins, protein, sugar, vitamins (A, B1, B2, B6, E) etc.	vasorelaxant	[40, 57, 67]
Prunus spinosa	phenolic compounds, carotenoids, anthocyanins, neochlorogenic acid, caffeic acid, myricetin, cyanidin-3-O-glucoside, cyanidin-3-O-routineoside, peonidin-3-O-glucoside, quercetin, tannin, pectin, Ca, Fe, K, Na, Mg, PA etc.	heart strengthener	[40, 52, 53, 57, 66,]
Punica granatum	anthocyanins, glucose, catechin, luteolin, quercetin, kaempferol, gallagic, glycosides, punicagin, punicalin, pedunculin, olyphenols, punicalagin, alkaloids, vitamin P1 ; ascorbic, gallic, caffeic, linolenic, linoleic, oleic, stearic, punic, eleostearic and catalpic acid etc.	cardiovascular	[1, 60]

Table 1. *(continued)*

Rosa canina	phenolic compounds, carotenoids, polyphenols, ascorbic and malic acid, flavonoids, dimethyl sulfide, protein, tannin, Na, K, P, Mn, Mg, pectin, stronelol, vitamin C, A, B, K, P etc.	cardiovascular diseases	[52, 53, 57]
Rosmarinus officinalis	rosmarin, phenolic diterpenes, flavonoids, carotenoids, p-simene, linalool, gamma-terpinene, thymol, beta-pinene, alpha-pinene, 1,8-cineol, camphor, verbenon, borneol etc.	cardiovascular diseases	[40, 54, 60]
Ruscus aculeatus	saponin, steroidal saponin glycosides, ruskogenin, neoruscogenin, steroidal sapogenins, sterols, triterpenes, vitamin P1, coumarins, spartein, tyramine, glycolic acid-containing, ruscogenin, flavonoids, coumarin, tramines, fatty acid, resin etc.	prevents atherosclerosis, arteriosclerosis and chronic vein diseases	[1, 61]
Salix alba	salicylate, salicin, steroids, alkaloids, phenols, glycosides, tannins, salicyl alcohol, linolenic acid, galactose, 4,6-0-nonylidene, 4-acetoxy-3-methoxycinnamic acid, stearic acid, stearyl aldehyde etc.	prevention of cardiovascular diseases	[42, 68]
Salvia fruticosa	α-pinene, camfen, β-pinene, mirken, 1,8-cineol, γ-terpinene, cis-tujon, trans-thujone, camphor, terpinen-4-ol, trans- (E) - caryophilen, aromadendren, α- humulene etc.	reduces the risk of heart atack	[42, 69]
Salvia sclarea	α-thujene, α-pinene, camfen, β-pinene, myrcene, α-hexandrene, α-terpinene, p-simene, limonene, β ocimene, sabinene, linalol oxide, fenchone, terpinolene, linalol, camphor, borneol, myrtenol , piperitone, β-caryophyllene, sclareol etc.	vasecenstrieter	[42, 70]
Scrophularia nodosa	saponin, cardioactive glycoside, resins, sugars, organic acids, iridoidglucoses, aucubin, harpagoside, acetylharpagide, flavonoid, husteridine, cinnamic acid, malic acid, caffeic acid, pekacic acid, alkaloid, scrophylar, tannin, lecithin, vitamin C etc.	cardiac stimulant	[42, 71]
Tribulus terrestris	fixed oils, resin, saponin, astragaline, harmin, tannin, flavonoids, alkaloids, glycosides, phytosteroids etc.	vasodilator	[40, 66]
Tulipa armena	alkaloids, flavonoids, tuliposide, tulipoline etc.	heart rhythm regulator, vein expander	[42]
Urginea maritima	tannin, organic acids, mucilage, glycoside, flavone etc.	heart rhythm regulator, vein expander	[40, 66]

Table 1. *(continued)*

Valeriana officinalis	polysaccharides, alkaloids, valepotrathies, valerianic and isovalerianic acid, monoterpenes, borneol, bornyl acetate, pinene, campen, 1-8 cineol, α-humulene, mirsen, tannin, starch etc.	prevents heart palpitation	[1, 40, 61]
Viscum album	alkaloids, resin, saturated fatty acids, saponin, luteol, quercitol, viscotoxin, protoin, caffeic acid, flavonoite, carotenoite, organic acid etc.	reduces heart rate	[1, 72]
Ziziphus zizyphus	sugar, alkaloids, mucilage, triterpenoid, saponin, flavonoid, pectin, vitamin C etc.	prevents arteriosclerosis	[40]

Factors such as socio-economic conditions, rapid urbanization, stress and unhealthy nutrition increase the risk of cardiovascular diseases [16]. Cardiovascular diseases are the major responsible for morbidity and mortality worldwide according to significant physical, social and emotional consequences [17]. Medical and developmental treatment after cardiovascular diseases cause high costs and job losses. For example, cardiovascular diseases have been reported to cause a loss of EUR 35 billion to the European Union (EU) economy [11].

Free radicals, the products of oxidation reactions, cause damage to cells and tissues, causing a number of chronic diseases, especially heart diseases [18]. In animal experiments, it was determined that free radicals pave the way for cardiovascular diseases [19,20]. Lipids, blood products, carbohydrates accumulate in the veins with changes in the vessel wall, fatty tissue reactions and calcium settlements defined as arteriosclerosis one of the most important causes of cardiovascular diseases [21]. Oxidized LDL plays an important role in arteriosclerosis and plaque formation. Antioxidants can reduce risk of arteriosclerosis by preventing oxidation of LDL [22].

Cardiovascular disease is a health problem that can be prevented by healthy eating and lifestyle changes or can be healed with medical treatments, nutritional therapy and lifestyle changes [14]. Lifestyle is effective on total cholesterol and low density lipoprotein cholesterol levels and may benefit from phytosterols among dietary supplements and functional foods in the treatment of dyslipidemias [16].

It is known that antioxidants are effective on the development of heart diseases and also vitamins A, C, E, phenolic compounds, certain antioxidant enzymes and minerals reduce or prevent free radical damage in the body. Plants contain some enzymes and small molecules with antioxidant properties that protect cells from the negative effects of free radicals. It is useful to investigate the benefits of these antioxidants in the treatment of cardiovascular diseases by appropriate methods.

Carotenoids have functions to prevent arteriosclerosis, to retain free radicals, to prevent LDL from oxidation [23, 24]. The most common carotenoids found in medicinal plants are lycopene, α-carotene, β-carotene, β-cryptoxanthine, lutein and zeaxanthin. For example, *Adonis aestivalis*, *Cornus mas*, *Crataegus monogyna*, *Rosa canina*, *Rosmarinus officinalis* and *Viscum album* are very rich in carotene

Vitamin E has the effect of preventing or reducing the formation of arteriosclerosis and preventing the formation of free radicals [25]. *Olea europaea* and *Prunus amygdalus*

var. *dulcis*, which is the subject of this study, are rich by vitamin E, which explains the use of these plants in the treatment of cardiovascular diseases among the public.

Vitamin C is a water-soluble vitamin which prevents oxidation of LDL cholesterol, holds free radicals and prevents the formation and development of heart disease [26, 24]. In a study conducted in Western Finland, antioxidants and vitamin C have been reported to be protective against cardiovascular disease [27]. *Cornus mas*, *Crataegus coccinea*, *Crataegus monogyna*, *Crataegus orientalis* and other *Crataegus*, *Fragaria vesca*, *Rosa canina*, *Scrophularia nodosa* and *Ziziphus zizyphus* species which are subject of this study were found to be remarkable because of the richness of vitamin C.

It is reported that vitamin B reduces the level of homocysteine in the blood when taken with folic acid [28]. *Fragaria vesca*, *Prunus amygdalus* var. *dulcis* and *Rosa canina* seeds and fruits are prominent in terms of vitamin B content.

Flavonoids have been found to capture free radicals [29] and lower total cholesterol and LDL levels in the blood [30].

In this study, plants that are determined to be used colloquially at cardiovascular diseases; *Agrimonia eupotaria*, *Cornus mas*, *Crataegus orientalis*, *Crataegus tanacetifolia*, *Fragaria vesca*, *Leonurus cardiaca*, *Rosa canina*, *Rosmarinus officinalis*, *Ruscus aculeatus*, *Scrophularia nodosa*, *Tribulus terrestris*, *Tulipa armena* and *Ziziphus zizyphus* become prominent with their rich phalavonoid content. Therefore, it supports the use of these plants against complementary and alternative medicine against cardiovascular diseases.

For example, *Punica granatum* and *Crataegus* sp. species; flavanoids (anthocyanins, catechins and other complex flavanoids), hydrolysable tannins (punicalin, pedunculgin, punicalagin, gallic and ellagic acid esters of glucose), polyphenols, fatty acids (conjugated and non-conjugated), aromatic compounds, amino acids, tocopherols terpenoid, alkaloids, such as antioxidant activity is rich in phenolic compounds that make up 92% [31].

Quercetin, which is known to inhibit platelet aggregation and LDL oxidation [30], is among the subjects of the study; It is found in the phytochemical composition of *Alchemilla vulgaris*, *Inula helenium*, *Leonurus cardiaca*, *Pelargonium graveolens*, *Prunus spinosa* and *Punica granatum*.

Natural products with high antioxidant content increase the defense power of the body against oxidation systems and especially prevent the oxidation of LDL and many other cellular structures and ultimately regress the formation of cardiovascular diseases [15]. Accordingly, by consuming foods with high antioxidant content, the effect of cardiovascular diseases and other chronic diseases can be reduced.

Digoxin used in the treatment of congestive heart failure is obtained from the leaves of the *Digitalis lanata* plant and is the main component of some heart medications [32]. However, it is reported that digoxin toxicity may develop in patients with renal insufficiency as digoxin is excreted through the kidneys. On the other hand, the therapeutic properties of heart glycosides as well as toxic effects are high. The use of plants containing cardiac glycosides with a very narrow safety interval between the therapeutic and the toxic doses requires great attention. In addition, cardiac glycosides tend to accumulate in the body and it is reported that the minimal effective dose in use may be five to ten times lethal doses [33].

Although it is intensely used around the people, the use of some plants against cardiovascular diseases should be in control or not used at all. For example, although the hawthorn plant is widely used among the public, it is not recommended to use it together

with the drug because it increases the effect of cardiac glycosides and nitrates [34]. For these reasons, attention should be paid to plant-drug interaction.

Cardiac rehabilitation program is an important application developed to help people with various cardiovascular diseases, improve their symptoms and increase their functional capacity [35]. However, the small number of detailed scientific studies on this subject complicates complementary and alternative medicine applications. On the other hand, plants used as complementary have side effects such as hypersensitivity reactions, perioperative, hepatotoxicity, nephrotoxicity. [36]. A large number of plants identified or not listed in this study are used in cardiovascular diseases among the population. However, the lack of scientific data about the subject makes these alternative uses suspicious and impossible. The therapeutic range of cardiac drugs is very narrow. Prescription drugs are likely to interact with phytochemical compounds contained in medicinal plants, as in hawthorn specimens. The use of herbal cures with the drug carries risks. Therefore, the use of complementary and alternative medicine in cardiovascular diseases should be done under the advice and supervision of a doctor.

In studies on the use of complementary and alternative medicine in cardiovascular diseases, the use of herbal nutritional supplements is reported to be 32%, and the most commonly used plants are garlic, echinacea, flaxseed, parsley-containing preparations, ginseng and some mixtures [36].

In 1998, the National Center for Complementary and Alternative Medicine (NCCAM) was established. In our country, the "Regulation on Traditional and Complementary Medicine Practices" was published in the Official Gazette [37, 38]. At that regulation, the characteristics of practitioners are standardized. It includes the constraints about the education of the practitioners, the propriety of the health establishment and which method can be used on which diseases.

CONCLUSION

As a result, in this study, it was determined that 54 plant varieties were used against cardiovascular diseases among the people in Western Anatolia and some of them were also included in Pharmacopoeias. Although complementary and alternative medicine is considered as a creative and innovative approach to protect health in cardiovascular diseases, it also carries very important risks. Risks such as the lack of reliable scientific studies and plant-drug interactions on this subject pose an important obstacle in cardiac rehabilitation program applications. The widespread use of plants among the public requires more detailed studies on this subject.

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