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ROLE OF HERBAL SUPPLEMENTS IN CARDIOVASCULAR DISEASE

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Abstract:

According to the estimations provided by the World Health Organization (WHO), cardiovascular disease (CVD) is causing the death approximately 17.9 million individuals per year. Several herbal products have been investigated for their potential to perform various actions, including those that are hypolipidemic, anti-inflammatory, hypoglycemic, hypotensive, and antiplatelet. It has been revealed that certain antioxidants, including green tea, garlic, flaxseed, grape seed extract, milk thistle, Artichoke extract, Berberine and others, positively impact the heart's health. It has grown increasingly common to use supplements made from herbs as an alternate or complementary method of bolstering cardiovascular health; however, the extent to which these supplements work and whether they are safe can vary. Although additional research is needed to determine their usefulness and safety prior to use, this article highlights a variety of herbs that have been shown to have cardioprotective effects.

Keywords: CVD, herbal supplements, hawthorn, heart health, hypertension.

Introduction:

Cardiovascular and metabolic diseases are a major global issue, with 17.9 million people dying yearly from cardiovascular disease (CVD). The prevalence of heart disease globally is increasing, and the WHO predicts that it will cause the deaths of 22.2 million people by 2030 [1,2]. Since 1990, the Worldwide Impact of Disease, Injury, and Hazards research has observed trends in death and disability. Cardiovascular disease, also known as the describes a collection of conditions that can affect both the heart and the blood arteries. It has been anticipated that heart attacks and strokes are responsible for four out of every five deaths caused by cardiovascular disease (CVD). Furthermore, it has been predicted that one-third of these deaths occur prematurely in patients under the age 70. [2,3]. Unhealthy eating habits, insufficient physical exercise, smoking, and excessive drinking are the four major behavioural risk factors for cardiovascular illnesses. Other risk factors include obesity and diabetes. It is necessary to have health policies that establish an environment conducive to the availability and affordable options for leading a healthy lifestyle to lower the risk of developing cardiovascular disease in oneself or another. The term "cardiovascular disease" refers to conditions affecting the heart and blood vessels. These conditions include coronary heart disease,

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cerebrovascular illness, peripheral arterial disease, rheumatic heart disease, congenital heart disease, deep vein thrombosis, and pulmonary embolism. Cardiovascular disease is abbreviated as "CVD." Herbal Drugs. Traditional medicine and ethnomedicine are as old as humanity. Herbal extracts and active components have been utilised to manufacture medications for centuries. The WHO reported that 65% of the world used plant-based traditional medicines in 1985 [3-6].

Different countries use comparable herbs or plants for mental and physical well-being. Combinatorial chemistry changed drug development from natural products to lab synthesis in the late 1980s. Traditional herbal and plant-derived extracts are becoming popular as research confirms their efficiency in illness prevention and therapy. Plant bio actives have yielded several chemically diverse secondary metabolites tuned for biological effects but not for therapeutic use. Researchers have rediscovered herbal and plant-based therapies despite improvements in combinatorial chemical synthesis and synthetic drug manufacture [1,2,3].

Traditional herbal and plant-derived remedies have rekindled interest in therapeutic plant items in rural poor nations. Herbal and plant remedies are cheap and contain thousands of bioactive components with therapeutic benefits. Further research is needed to confirm their efficacy and safety due to their life-threatening side effects. Natural products beat synthetic drug screening libraries in biological activity and structural variation. Structural modifications boost bioactive natural product potency, selectivity, and pharmacokinetics, creating novel drug-like lead compounds.Traditional herbs are becoming more popular due to their commercial commodity in many markets and their proven therapeutic potential in several settings, including cardiovascular conditions[3,4].. We studied CVDs' molecular, cellular, and metabolic therapeutic benefits [6-9].

Treatment of Cardiovascular Disease with Herbal Supplements

Heart and blood vessel problems are collectively referred to as "cardiovascular disease" (abbreviated as "CVD"). Heart failure, coronary artery disease, and stroke are some of these disorders. Although herbal therapies cannot replace medical treatment and lifestyle changes, several herbs may have potential benefits for managing cardiovascular disease. Before utilising any herbal medicines, it is imperative that you discuss your treatment options with a qualified medical practitioner, particularly if you have an existing medical condition or if you are already under the care of a medical practitioner [2,4]. The following is a list of several herbs that have been investigated for their potential benefits for cardiovascular health:

1.Red yeast rice

Red yeast rice is a traditional Chinese culinary preparation made by fermenting rice with Monascus purpureus, a type of red yeast. It has been used in herbal Chinese medicine for millennia as a treatment for various maladies, including cardiovascular disease (CVD). Red yeast rice contains monacolins, including monacolin K, which is structurally similar to the active element in cholesterol-lowering medication. lovastatin [5,6]. Ovastatin belongs to the statin class of medicines routinely recommended to lower cholesterol levels and manage CVD risk factors. Red yeast rice prevents CVD by inhibiting HMG-CoA reductase, which forms cholesterol. Red yeast rice inhibits this enzyme, lowering total cholesterol, LDL-C, and triglycerides while raising HDL-C, or "good" cholesterol. [10]. Several clinical experiments have been carried out to investigate the efficacy of red yeast rice in lowering risk factors for cardiovascular disease.

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According to the findings of this study, consumption of red yeast rice can bring about reductions in total cholesterol, LDL-C, and triglyceride levels, as well as improvements in the ratio of LDL-C to HDL-C. The amount of these impacts, however, differs between individuals. It's worth noting that red yeast rice includes naturally occurring lovastatin and other monacolins, which can have drug-like effects and potential adverse effects similar to prescription statin drugs. As a result, red yeast rice products should only be used under medical supervision and in cooperation with a healthcare practitioner, especially if you are already using cholesterol-lowering drugs or have liver problems [5,6].

2.Hawthorn

Hawthorn, often called Crataegus, is a plant frequently used in traditional medicine due to its possible benefits for the cardiovascular system. Its impact on cardiovascular conditions, such as cardiovascular disease (CVD), has been the subject of research. It is believed that hawthorn extract has multiple modes of action, each potentially treating patients suffering from cardiovascular disease (CVD). It is considered that the fact that it contains a wide variety of bioactive components, including as flavonoids and procyanidins, is an ingredient that contributes to its curative properties. [3,5,11]. Possible health advantages of hawthorn for cardiovascular disease include the following:
A. Enhanced cardiac function: It's possible that hawthorn can enhance cardiac function by making the heart muscle contract more forcefully and blood flow more efficiently. Additionally, there is a possibility that it will have a beneficial effect on the electrical activity of the heart [7,11]

B. Vasodilation: This is because hawthorn has vasodilatory properties. People who suffer from hypertension or other cardiovascular diseases might find this effect beneficial [5,11].

C. Antioxidants activity: Antioxidants can eliminate the damage caused by free radicals and lower levels of inflammation in the blood vessels [11]. Hawthorn has a slight lipid-lowering impact, which can reduce both total cholesterol and LDL cholesterol levels. Managing lipid levels is critical for cardiovascular health since high cholesterol is a cardiovascular disease (CVD) risk factor [5,11].

3. Artichoke extract (ALE): Artichoke extract (ALE) is a supplement made from the artichoke plant's leaves (Cynara cardunculus). It contains cynarin, chlorogenic acid, and flavonoids, among other beneficial substances. The possible health benefits of ALE have been explored, notably in connection to cardiovascular disease (CVD) [5,8]. Furthermore, some dietary supplements, such as artichoke extract, have been studied for their possible cardiovascular benefits. According to research, artichoke extract may have various beneficial impacts on cardiovascular health. Here are some potential effects of ALE on CVD:

A. Cholesterol management: It has been showed that artichoke extract can reduce total cholesterol as well as LDL ("bad") cholesterol while simultaneously raising HDL ("good") cholesterol. The presence of cynarin and other chemicals in ALE that improve cholesterol metabolism is thought to be responsible for these effects [8,9,12].

B. Blood pressure control: ALE has a minor hypotensive (blood pressure-lowering) action. It is thought to stimulate vasodilation, which can aid in blood pressure reduction. However, evidence for this effect is minimal, and more research is required [5,12].

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C. Antioxidant activity: Artichoke extract antioxidants, such as chlorogenic acid and flavonoids, can help lower oxidative stress and inflammation, both of which are known risk factors for CVD [5,12].

D. Endothelial function: Endothelial cells line the inside of blood arteries and are critical to cardiovascular health. According to certain research, ALE can improve endothelial function, potentially increasing blood vessel dilatation and lowering the risk of atherosclerosis. While, there is some hopeful evidence that artichoke extract may have cardiovascular advantages, it is crucial to remember that more research is needed to determine its efficacy and ideal dosages [12].

4. Grape seeds: Grape seeds, obtained from Vitis vinifera grapes, have been the focus of scientific inquiry due to their possible health advantages, particularly in relation to cardiovascular health. Grape seeds include a number of bioactive chemicals, the most notable of which are polyphenols, which include procyanidins, flavonoids, and resveratrol [8,13].

Benefits of Grape seeds in Cardiovascular Health:

A. Antioxidant Properties: Grape seeds contain a high concentration of antioxidants, which aid in preventing oxidative damage to cells triggered by free radicals. Grape seed polyphenols have been proven to have substantial antioxidant activity, which may help reduce the risk of cardiovascular disease [3].

B. Anti-Inflammatory Effects: Chronic inflammation has been linked to the development and progression of cardiovascular illnesses. Grape seed polyphenols have been demonstrated to have anti-inflammatory characteristics, which can help reduce inflammation in blood vessels and the risk of heart disease [5,13].

C. Blood Pressure Control: Several research have suggested that grape seed extract may have a minor influence on blood pressure. Grape seed polyphenols can relax blood vessels and enhance blood flow, resulting in better blood pressure regulation [13].

D. Cholesterol Management: Grape seed extract has been proved to lower LDL cholesterol and raises HDL cholesterol level. This equilibrium may reduce atherosclerosis and coronary heart disease [13].

E. Endothelial Function: The endothelium, which lines blood vessels, is essential for sustaining cardiovascular health. Grape seed extract has been demonstrated to improve endothelial function, supporting healthy blood vessel dilation, and overall vascular health [5,13].

5. Berberine: Berberine has been shown to have potential antihypertensive effects by altering several mechanisms involved in blood pressure regulation. It has the potential to suppress the renin-angiotensin-aldosterone system (RAAS), reduce peripheral vascular resistance, and increase endothelial function, resulting in lower blood pressure levels [5,14].

A. Anti-inflammatory and Antioxidant characteristics: which can aid in the reduction of inflammation and oxidative stress associated with CVD. Berberine may protect against endothelial dysfunction and vascular damage by suppressing pro-inflammatory cytokines and oxidative stress pathways [14].

B. Insulin regulation: Berberine's effects on glucose metabolism and insulin sensitivity have been widely researched. It can improve insulin signaling, increase glucose absorption, and reduce insulin resistance. Berberine's ability to

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regulate blood glucose levels makes it a potential aid in preventing or managing diabetes, a key contributor to the development of cardiovascular disease [5.14].

C. Atithrombotic properties: It may reduce the risk of blood clot formation and thrombotic events associated with CVD [14].

6. Milk thistle (Silybum marianum): For centuries, milk thistle has been used as a natural medicine for various ailments, including liver problems. While there is some evidence that milk thistle may have potential cardiovascular health advantages, its involvement in cardiovascular disease (CVD) is well established. Milk thistle contains silymarin, an antioxidant and anti-inflammatory flavonoid [5,8]. Silymarin may improve LDL cholesterol, triglycerides, and HDL cholesterol. These effects may minimise CVDs such atherosclerosis. Furthermore, silymarin has been shown to have antiplatelet and antithrombotic properties, implying that it may help prevent blood clot formation and lower the risk of heart attacks and strokes. However, more research is required to fully understand the mechanics and clinical importance of these effects. While milk thistle shows promise as a potential natural supplement for cardiovascular health, it should not be used instead as an established medical therapy for CVD [5,15].

6. Green tea: Researchers have been looking into the possibility that drinking green tea made from the Camellia sinensis plant leaves could help lower one's risk of developing cardiovascular disease (CVD) [5]. The following is some information regarding green tea and its connection to cardiovascular disease:

A. Antioxidants: An antioxidant Green tea contains catechins, including EGCG. These antioxidants reduce oxidative stress and inflammation, which contribute to cardiovascular disease.Green tea can help manage cholesterol by improving lipid profiles. It may lower total cholesterol and raise "good" HDL cholesterol. Green tea catechins may lower the oxidation of "bad" LDL cholesterol [5,16].

B. Regulation of Blood Pressure Green tea consumption has been suggested in a number of studies to have the potential to help reduce blood pressure. Catechins, which are found in green tea, have been shown to increase endothelial function and promote blood vessel dilatation, both of which can result in a moderate reduction in blood pressure levels [5,8,16].

C. Anti-inflammatory effects: Anti-inflammatory actions can help prevent cardiovascular disease (CVD) from chronic inflammation. Anti-inflammatory green tea catechins may protect the cardiovascular system [8,16].

D. Endothelium function: The endothelium or inner lining of blood vessels, is responsible for several important functions. Endothelial dysfunction is a significant contributor to cardiovascular disease (CVD) development. It has been demonstrated that the catechins included in green tea can improve endothelial function and boost nitric oxide generation. Nitric oxide is a chemical that aids in the relaxation of blood vessels and promotes healthy blood flow [8,16].

7. Leonurus cardiaca L.,: *Leonurus cardiaca L*, frequently referred to as motherwort, is a herbaceous perennial plant that has long been used for medicinal purposes. Motherwort has been used in the context of cardiovascular diseases (CVDS) for its possible benefits in promoting heart health. While some traditional and anecdotal evidence supports

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its use, scientific research on its effectiveness specifically for CVDS is limited, and more studies are needed to confirm its efficacy [5,17].

9. Equisetum arvense L. Field or common horsetail, *Equisetum arvense L.*, is a perennial herbaceous plant in the Equisetaceae family. It's been utilised in traditional medicine for years.CVD stands for cardiovascular disease, which affects the heart and blood arteries.Coronary artery disease, heart failure, stroke, and excessive blood pressure are all examples of common cardiovascular diseases [18].While quisetum arvense L. has been used medicinally, limited scientific data supports its efficacy in treating or preventing cardiovascular disease. The plant includes several bioactive chemicals, such as flavonoids, silica, and saponins, which may have health advantages. According to certain research, Equisetum arvense extract may have antioxidant and anti-inflammatory effects that may benefit cardiovascular health. More research is needed, however, to determine its usefulness and safety in treating or preventing CVD [5,18].

10. Terminalia arjuna: Terminalia arjuna has received attention for its possible cardiovascular benefits, and its therapeutic effects in the treatment of CVD have been intensively researched. *Terminalia arjuna* tree bark includes bioactive substances such as tannins, triterpenoids, flavonoids, and minerals, which are thought to contribute to its therapeutic qualities. In animal studies, these substances have shown antioxidant, anti-inflammatory, antiplatelet, lipid-lowering, and vasodilatory properties.*Terminalia arjuna* research has yielded encouraging results in various facets of cardiovascular health[19. The following are some of the potential benefits of *Terminalia arjuna* for CVD:

A. Cardioprotective Properties: Terminalia arjuna reduces inflammation, oxidative stress, and heart function.Terminalia arjuna's vasodilation and vascular resistance may lower blood pressure.Terminalia arjuna extracts decrease cholesterol, LDL cholesterol, and triglycerides. It may improve HDL cholesterol.Terminalia arjuna can prevent blood clots and cardiovascular events due to its antiplatelet and antithrombotic properties[19].

B. The antioxidant and anti-inflammatory properties: The antioxidant and anti-inflammatory properties of Terminalia arjuna help neutralise damaging free radicals, lowering oxidative stress. It also has anti-inflammatory properties that are advantageous to cardiovascular health [12,13].

12. Strophanthus*: Strophanthus* is a flowering plant genus in the Apocynaceae family. Strophanthus species have been utilised in traditional medicine for their therapeutic characteristics. Strophanthus kombe, in particular, has been researched for its possible impact on cardiovascular disorders (CVD). *Strophanthus* species seeds and extracts have been employed in traditional medicine as cardiac stimulants and in treating heart-related illnesses. The active chemicals in Strophanthus plants, such as ouabain and strophanthin, have been demonstrated to have cardiovascular and vascular effects.However, it is crucial to highlight that recent scientific evidence does not support the use of Strophanthus plants or their extracts in treating cardiovascular illnesses. The use of ouabain and related chemicals derived from Strophanthus species in CVD has been largely replaced by alternative drugs with better-known safety profiles and efficacy [5,19].

13. Thymus serpyllum L.: *Thymus serpyllum*, known as wild thyme or creeping thyme, is a perennial herbaceous plant in the Lamiaceae family. It is distinguished by its scented leaves and little purple or pink flowers. While thyme

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has long been used as a culinary herb and for medical purposes, its specific effects on cardiovascular disease (CVD) remain unknown [5,20].

14. Digitalis purpurea L.: *Digitalis purpurea* is known as foxglove, is a flowering plant in the Plantaginaceae family. It is native to Europe, although it has been widely grown and naturalized around the world. While Digitalis purpurea is most known for its decorative appeal in gardens and landscapes, it also has medicinal properties. The plant contains several cardiac glycosides, the most known of which is digoxin. Cardiac glycosides are chemicals that have a powerful effect on the heart and are used to treat cardiovascular disorders such as congestive heart failure and certain arrhythmias [5,21]. digoxin, derived from Digitalis purpurea, is used to treat cardiovascular diseases (CVDs) because it increases cardiac output by improving the efficiency of heart contractions. It accomplishes this by blocking Na+/K+-ATPase, a protein that regulates the passage of sodium and potassium ions in cardiac muscle cells. This inhibition increases intracellular calcium concentration, resulting in increased heart muscle contraction. By enhancing the power and efficiency of cardiac contractions, Digoxin helps reduce symptoms of congestive heart failure such as weariness, shortness of breath, and fluid retention. It can also be used to treat arrhythmias, most notably atrial fibrillation [21].

15. Motherwort: Motherwort includes a number of bioactive chemicals, including as alkaloids, flavonoids, and phenolic acids, which are thought to contribute to its possible medicinal effects. It's been used to treat signs of cardiovascular disease such heart palpitations, hypertension (high blood pressure), and anxiety [22]. Motherwort of the potential benefits of motherwort in connection to CVDS include:

A. Strengthen the heart muscle: Motherwort has traditionally been used as a cardiac tonic, which support and strengthen the heart muscle [5,22].

B. Vasodilation: Motherwort may have vasodilatory characteristics, which means it may help widen blood vessels and improve blood flow [5,22].

C. Mild sedative and anxiolytic effects: Motherwort has been utilised for its soothing characteristics, which may aid in the reduction of anxiety and stress-related symptoms that are frequently connected with cardiovascular diseases [5,22].

D. Antioxidant activity: Motherwort shows antioxidant properties that can guard against oxidative stress and inflammation has been linked to cardiovascular disease [5,22].

16. Elecampane, or Inula helenium L.: *Inula helenium is* a perennial herbaceous plant native to Europe and parts of Asia. It has traditionally been used in herbal therapy for various ailments, including respiratory disorders. It involves, among other things, coronary artery disease, heart failure, stroke, and excessive blood pressure. While Inula helenium has traditionally been used to treat respiratory problems, there needs to be more scientific information on its specific benefits on cardiovascular health or the treatment or prevention of cardiovascular disorder [5,23].

17. Claviceps purpurea (Fr.) Tul.: *Claviceps purpurea* (Fr.) Tul is a fungus that is usually referred to as ergot. It is a member of the Ascomycota phylum and the Hypocreales order. Ergot is a plant pathogen that primarily affects grasses, especially rye and other grains. Ergot alkaloids, hazardous to humans and animals, are produced when it is consumed in significant quantities [5]. These alkaloids can produce ergotism, often known as St. Anthony's fire. Ergotism is

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classified into two types: gangrenous ergotism, which disrupts blood circulation and can result in tissue death, and convulsive ergotism, which induces spasms and hallucinations. However, it is crucial to remember that ergot alkaloids have also been employed in medicine. Ergotamine and ergonovine, two ergot-derived chemicals, have been used to treat migraines, induce labour during childbirth, and regulate postpartum bleeding. It encompasses coronary artery disease, heart failure, stroke, and hypertension. More research is needed to establish a direct link between Claviceps purpurea (Fr.) Tul. and cardiovascular disease [5,24].

18. Valeriana officinalis L.: Valeriana officinalis L., known as Valerian, is a perennial flowering plant with medical benefits. It is well-recognised for its relaxing and soothing properties, and it has been used to treat symptoms of anxiety, sleeplessness, and stress. Regarding its potential impact on cardiovascular disease (CVD), Valerian is not commonly regarded as an effective treatment for CVD. However, because stress and anxiety can impact cardiovascular health, Valerian's relaxing characteristics may indirectly benefit CVD patients by helping them manage these psychological variables. Valerian may benefit general heart health by increasing relaxation and lowering stress. It is vital to emphasize that Valerian is not a substitute for treating CVD and should not be used solely to treat cardiovascular problems [5,25].

19. *Urtica dioica L., :* *Urtica dioica L* known as stinging nettle, is a plant that has long been utilised for medical purposes. While there is less study on the impact of stinging nettle on cardiovascular disease (CVD), it may have some qualities that may be beneficial. Stinging nettle includes compounds that have been shown to have anti-inflammatory actions. Because chronic inflammation contributes to the development and progression of CVD, decreasing inflammation may benefit cardiovascular health [26].

20. Schisandra chinensis (Turcz.) Baill: *Schisandra chinensis* (Turcz.) *Baill.,* frequently recognised as Schisandra or Chinese Magnolia Vine, is a plant species native to China and portions of Russia. It has been utilised in traditional Chinese medicine for millennia for its potential health advantages. Cardiovascular disease (CVD) is a disorder that affects the heart and blood arteries. [5]. While *Schisandra* chinensis has a long history of usage in traditional medicine, its usefulness in treating or preventing CVD has yet to be thoroughly established by scientific studies. Certain chemicals in *Schisandra*, such as lignans, may have potential cardiovascular advantages. Lignans are known for their antioxidant and anti-inflammatory qualities, which may aid heart health. They may also aid to improve liver function and manage lipid metabolism, indirectly promoting cardiovascular health.It is crucial to remember that depending simply on *Schisandra* or any other single herb or supplement for managing or treating CVD is inadequate[27].

21. Panax ginseng: Panax ginseng, frequently referred to as Asian ginseng or Korean ginseng, is a well-known herbal treatment that has been utilised for decades in conventional medical practise. It is believed to provide a number of benefits to one's health, including potential impacts on one's cardiovascular system [8,11,28].

A. Cardiovascular Health: *Panax ginseng* is being studied for its effects on cardiovascular health, and some research indicate that it may be beneficial. Here are some of the potential CVD effects of Panax ginseng [28].

B. Mananging of Blood Pressure: *Panax ginseng* may help manage blood pressure by relaxing blood vessels and lowering arterial stiffness, according to certain research. This could hppp in managing hypertension, a major risk factor for cardiovascular disease [28].

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C. **Antioxident**: Ginsenosides, found in Panax ginseng, have antioxidant effects. Antioxidants help protect cells from free radicals and oxidative stress, both of which have been linked to the development of cardiovascular disease [28].

D. lower total cholesterol *Pinax ginseng* help lower total cholesterol, LDL cholesterol (the "bad" cholesterol), and triglyceride levels while boosting HDL cholesterol (the "good" cholesterol), according to some research. Maintaining healthy cholesterol levels is critical for heart health [5,28].

22.Tribulus terrestris L.: *Tribulus terrestris L*., known as puncturevine or caltrop, is a plant species that has long been utilised in traditional medicine for its potential health advantages. Tribulus terrestris has been studied for its impact on cardiovascular health, notably in the context of cardiovascular disease (CVD). However, it is crucial to emphasise that scientific study in this area needs to be more extensive and conclusive. *Tribulus terrestris* has been examined for its possible cardiovascular effects because of its alleged capacity to increase nitric oxide (NO) generation, which may improve blood flow and cardiovascular function. Nitric oxide is a vasodilator, which means it widens blood vessels and improves circulation. According to recently research, *Tribulus terrestris* may have beneficial effects on some cardiovascular parameters [25-27]. For example, it has been shown in animal tests to lower blood pressure and to have antioxidant effects, which may be advantageous to cardiovascular health. Furthermore, *Tribulus terrestris* has been shown to have a lipid-lowering effect in animal models, implying that it may help lower cholesterol levels [5, 29].

23. *Nigella sativa:* Nigella sativa, often known as black seed or black cumin, has been investigated for its possible role in promoting cardiovascular health and wellness. The effects of Nigella sativa on cardiovascular disease risk factors such as hypertension, dyslipidemia, and oxidative stress have been the subject of investigation in a number of studies. Nevertheless, it is of the utmost importance to stress that even while there is evidence pointing to the possibility of advantages, additional research is necessary in order to arrive at definitive findings [5].

A. Blood pressure: According to specific research, Nigella sativa may help lower blood pressure. Nigella sativa supplementation reduced both systolic and diastolic blood pressure in patients with mild hypertension, according to a 2013 study published in the Journal of Hypertension [30].

B. Lipid profile: Research suggests that Nigella sativa may improve lipid profiles by lowering total cholesterol, LDL cholesterol (the "bad" cholesterol), and triglycerides while boosting HDL cholesterol (the "good" cholesterol). More research is needed to corroborate these findings [5,30].

C. Oxidative stress: Oxidative stress significantly contributes to the development and progression of CVD. According to specific research, Nigella sativa has antioxidant capabilities that may help lower oxidative stress and inflammation attributed to cardiovascular disease [30].

24. Garlic: There are a number of Allium species that are familiar to people. An A.sativum, Allium cepa L. and Allium ursinum L. [31].

A. Garlic (*Allium sativum*): Garlic has been extensively researched for its potential cardiovascular benefits. It contains chemicals like allicin, which have anti-inflammatory and antioxidant benefits. Garlic may help lower blood pressure, improve cholesterol levels by lowering LDL cholesterol and boosting HDL cholesterol, and prevent blood

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clot formation. While some studies have found favourable effects, the evidence is not yet convincing, and additional research is needed to grasp the extent of garlic's cardiovascular advantages fully [31].

B. Allium cepa L. (onion): The Allium genus includes garlic as well as onions. Onions, like garlic, contain sulphur compounds that have antioxidant and anti-inflammatory properties. According to some research, eating onions may help reduce the risk of CVD by improving lipid profiles, reducing blood pressure, and blocking platelet aggregation. More research, like with garlic, is needed to demonstrate a clear causal association between onion consumption and cardiovascular health [31].

C. Allium ursinum (wild garlic or ramson): Allium ursinum, often known as wild garlic or ramson, is a garlic and onion-related plant. Because of the existence of similar bioactive chemicals, it has some of the same potential cardiovascular advantages. However, research on Allium ursinum and its effects on CVD is limited, and further research is needed to identify its exact influence on cardiovascular health [5,8,31].

25. **Fennel**: Fennel, or Foeniculum vulgare, is a fragrant herb used in cooking and medicine for centuries. Fennel contains antioxidant, anti-inflammatory, and antibacterial properties, however its effect on cardiovascular disease (CVD) is unknown [32]. Certain research suggests fennel may enhance cardiovascular health. Fennel may help with cardiovascular diseases (CVD):

A. Antioxidant activity: Fennel includes a variety of antioxidants, including flavonoids and phenolic compounds, which can help neutralise damaging free radicals and reduce oxidative stress. Fennel has been shown to have anti-inflammatory properties as well. Oxidative stress has been linked to both the beginning and the progression of cardiovascular illnesses [32].

B. Blood pressure regulation: Fennel may have hypotensive effects, which means that it lowers blood pressure, according to the findings of some research conducted on animals. Compounds contained in fennel, such as anethole, have been shown to have the ability to relax blood vessels, which could result in a decrease in blood pressure. However, additional research is required to substantiate these effects in human beings [32].

C. Cholesterol management: Fennel seeds may decrease cholesterol. Fennel extracts may decrease total cholesterol and triglycerides linked to CVD. More human study is needed to determine how fennel affects circulation cholesterol levels [32].

CONCLUSION

Herbs and their preparations must be studied to reduce cardiovascular disease mortality and morbidity. Because heart disease rates are rising throughout all age groups. The focus is on herbal supplements including milk thistle, Arjuna, and Hawarth horn. Herbs are a popular topic when it comes to alternative or complementary treatments for health issues including cardiovascular disease (CVD). However, it is essential to remember that herbs' efficacy in treating cardiovascular disease needs to be established, and other research must be conducted to confirm the advantages and safety of these medications.

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