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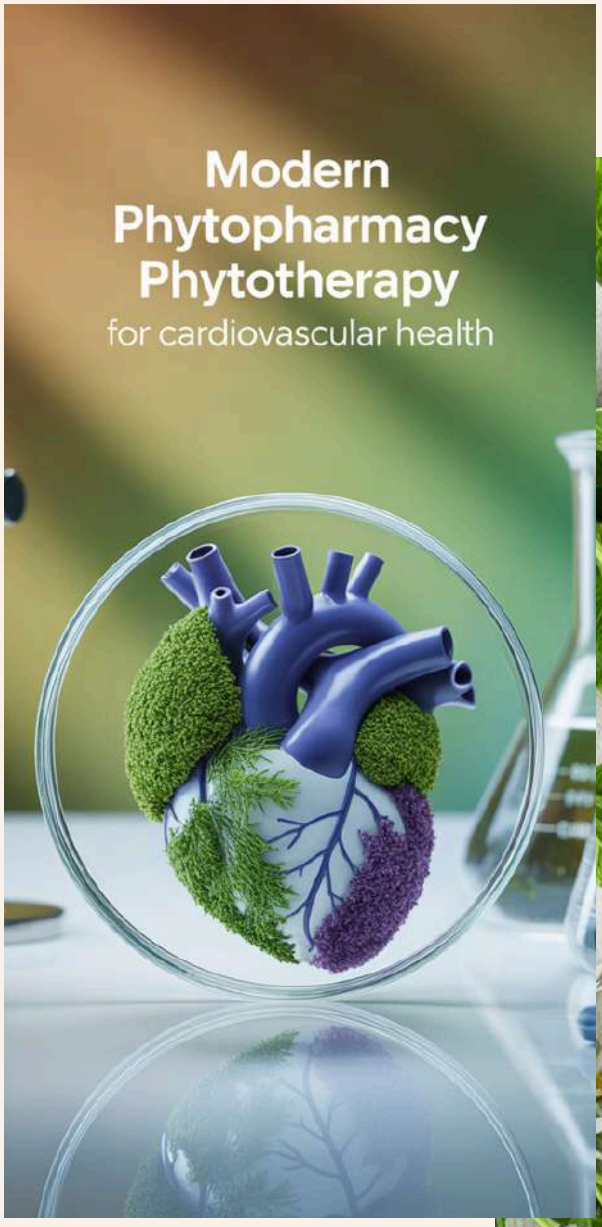


PHYTOTHERAPY FOR CARDIOVASCULAR HEALTH

SCIENTIFIC FOUNDATIONS OF HERBAL SUPPLEMENTS FOR REDUCING BLOOD PRESSURE, CHOLESTEROL, AND TRIGLYCERIDES

CARDIOVASCULAR HEALTH AND LIVER FUNCTION

botanical treasures offer a wide range of bioactive compounds that contribute to health and wellness.

2025

Summary of Contents

Clinical Relevance

Effective management of cardiovascular and liver health demands a comprehensive approach that simultaneously addresses multiple underlying factors. Phytotherapy offers multifaceted mechanisms of action, targeting oxidative stress, inflammation, lipid imbalances, and detoxification processes. This integrative effect makes herbal therapies a valuable complement to conventional medical treatments, supporting holistic patient care and improved clinical outcomes.

Cardiovascular System

The Central Regulator of Homeostatic Balance and Vital Functionalities of the Organism

The cardiovascular system represents a highly organized physiological entity whose integrated function plays a key role in maintaining systemic homeostasis, transporting oxygen, nutrients, and signaling molecules, as well as eliminating metabolic waste products. The heart and vascular network arteries, veins, and capillaries form a dynamic system through which constant tissue perfusion is achieved, essential for the stable internal environment of all organ systems.

The cardiac muscle (myocardium) functions as an electromechanical pump, whose activity is finely regulated by neurohumoral mechanisms. This regulation involves interactions between the autonomic nervous system and a complex hormonal milieu, including the renin-angiotensin-aldosterone system, natriuretic peptides, and other signaling molecules. The efficiency of cardiac contraction and vascular tone determines systemic hemodynamics, oxygenation, and nutrient supply to all cells.

One of the most significant and common disorders of the cardiovascular system is arterial hypertension — a condition of chronically elevated blood pressure that is often asymptomatic but carries extremely serious long-term consequences. As a leading risk factor for stroke, myocardial infarction, and heart and kidney failure, hypertension contributes significantly to the global burden of chronic non-communicable diseases. Its multifactorial etiology including genetic predisposition, autonomic regulatory imbalance, and inflammatory and oxidative processes, makes it a major clinical challenge in modern medicine. In maintaining cardiovascular system stability, a balanced lipid profile, preserved endothelial function, controlled inflammatory response, and adequate antioxidant capacity of the organism play crucial roles.

Contemporary approaches to support these processes include not only pharmacological therapy but also the integration of natural bioactive compounds with documented physiological effects.

In this context, formulated herbal preparations occupy a special place, with their effects supported by numerous clinical and experimental studies. Standardized herbal extracts, such as fermented garlic (Allium sativum), hawthorn (Crataegus spp.), mistletoe (Viscum album), lemon balm (Melissa officinalis), and wild garlic (Allium ursinum), have demonstrated antihypertensive, antioxidant, anti-inflammatory, antithrombotic, and hypolipidemic effects. Their action encompasses blood pressure regulation, lipid profile stabilization, microcirculation improvement, and endothelial protection.

The efficacy of these herbal extracts has been confirmed in randomized, placebo-controlled clinical trials, especially in individuals with hypertension, dyslipidemia, early stages of heart failure, and other forms of cardiovascular dysfunction. Due to their good tolerability, absence of serious side effects, and compatibility with conventional therapy, these natural extracts represent an excellent complement to chronic therapy, contributing to clinical stabilization and improved quality of life.

Precisely in this spirit, modern herbal preparations have been developed that target key mechanisms in the etiopathogenesis of cardiovascular diseases. In the following sections, products will be presented that, thanks to carefully selected ingredients and pharmacological properties, provide strong support in preserving the integrity and functionality of the cardiovascular system, both in preventive and therapeutic contexts.

Arterial Hypertension: A Systemic Disease with a Quiet Progressive Course and the Importance of Integrative Therapy

Arterial hypertension is a chronic, progressive, systemic condition, rightfully defined today as the most important global modifiable risk factor for developing a broad spectrum of cardiovascular, cerebrovascular, and nephrovascular complications. According to current recommendations of the European Society of Hypertension (ESH) and the World Health Organization (WHO), hypertension is diagnosed with persistently elevated systolic (≥140 mmHg) and/or diastolic (≥90 mmHg) blood pressure values, measured repeatedly under standardized conditions.

Pathophysiology and Etiopathogenetic Mechanisms

Hypertension arises from a complex interplay of genetic factors, environmental influences, and acquired disturbances of neurohumoral regulation. Key changes at multiple levels contribute to its development and progression:

- Endothelial dysfunction and reduced synthesis of nitric oxide (NO), the primary vasodilatory mediator, lead to loss of vascular elasticity and increased peripheral resistance.
- Hyperactivation of the renin-angiotensin-aldosterone system (RAAS) promotes sodium and water retention, increases intravascular volume, and directly stimulates vasoconstriction via angiotensin II.
- Increased sympathetic activity, typical of chronic stress, metabolic syndrome, and obesity, further contributes to vasospasm, tachycardia, and left ventricular hypertrophy.
- Oxidative stress and low-grade inflammation participate in endothelial cell damage, initiate the atherosclerotic process, and disrupt vascular wall homeostasis.

All these mechanisms cause structural changes in blood vessels, intimal thickening, fibrosis, loss of elasticity which not only contribute to increased blood pressure but also raise the risk of myocardial infarction, stroke, chronic kidney disease, aneurysm and aortic dissection, as well as heart failure due to diastolic dysfunction.

Clinical Implications and Therapeutic Challenges

Prolonged elevated blood pressure often progresses asymptomatically (“silent killer”), yet causes progressive target organ damage. Regular blood pressure monitoring and early diagnosis are crucial for preventing complications. However, despite the availability of a wide range of antihypertensive drugs, patient adherence and adverse effects remain significant challenges, highlighting the growing need for adjuvant therapeutic options that are effective, safe, and well tolerated.

Phytotherapy in Hypertension Management: The Complementary Potential of Natural Compounds

In light of these challenges, phytotherapy is increasingly recognized as an important part of an integrative approach to hypertension management. Certain plant species, rich in flavonoids, triterpenes, organosulfur compounds, and antioxidants, have demonstrated the ability to:

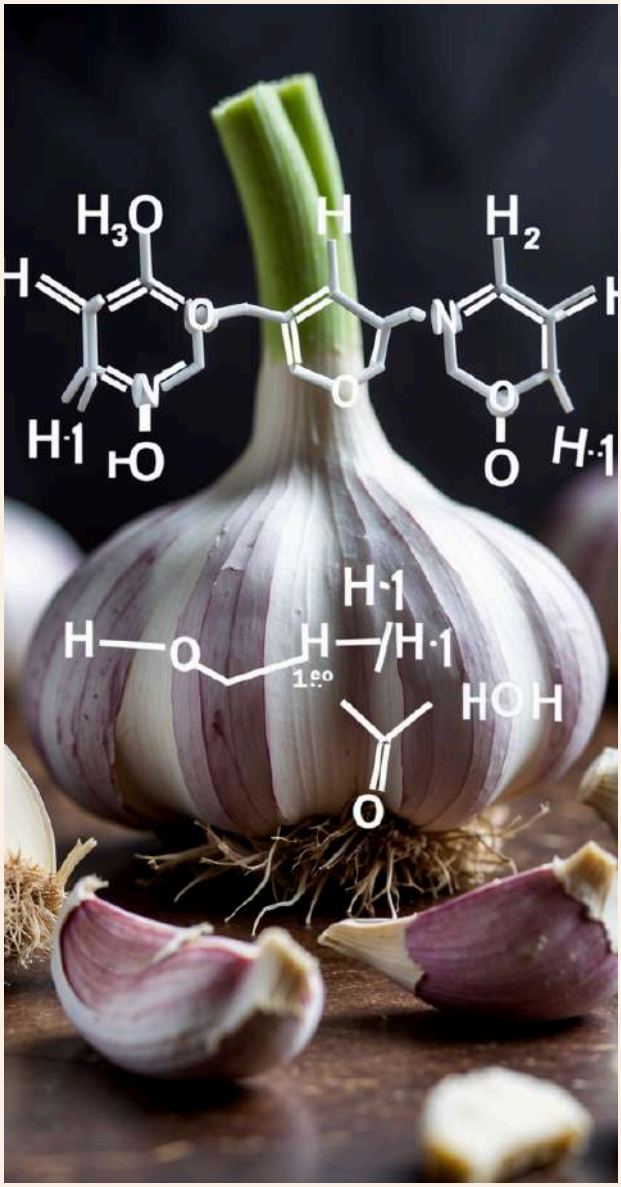
- Reduce peripheral vascular resistance by improving vasodilation and NO synthesis,
- Modulate the RAAS system and decrease fluid retention,
- Calm sympathetic hyperactivity and lower heart rate (especially in stress-related hypertension),
- Decrease oxidative stress and inflammation, thereby protecting the vascular endothelium and slowing atherogenesi

Preparations such as BLACK GARLIC CARDIO PLUS, containing fermented garlic (Allium sativum), hawthorn (Crataegus spp.), and white mistletoe (Viscum album), represent clinically relevant phytotherapeutic formulations with synergistic cardiovascular effects. Their use may be justified as support for individuals with early hypertension, borderline blood pressure values, hypercholesterolemia, and those with a family predisposition to cardiovascular diseases.

BLACK GARLIC CARDIO PLUS Phytotherapeutic Support for Blood Pressure Regulation and Cardiac Function

BLACK GARLIC CARDIO PLUS is formulated as a natural support for cardiovascular health, with a particular focus on individuals suffering from hypertension, hypercholesterolemia, and cardiac insufficiency. Its active ingredients – fermented garlic (Allium sativum), hawthorn leaf and flower (Crataegus spp.), and white mistletoe (Viscum album) – act synergistically on the primary mechanisms of hypertension and myocardial insufficiency.

Fermented Garlic (Allium sativum)



Fermented garlic, also called black garlic, is produced by controlled thermal processing at low temperatures and high humidity over several weeks, significantly altering the raw material's chemical composition and increasing concentrations of stable, bioavailable compounds, primarily S-allyl cysteine (SAC) – a compound exhibiting strong antioxidant and cardioprotective effects. Black garlic has reduced gastrointestinal irritation and better tolerability compared to raw garlic.

Mechanisms of action

Antihypertensive effect – potential ACE inhibition:

Several in vitro and in vivo studies suggest that sulfur compounds in garlic, especially SAC, can inhibit angiotensin-converting enzyme (ACE), crucial in the formation of angiotensin II, a potent vasoconstrictor. Lowering angiotensin II levels leads to relaxation of vascular smooth muscles and blood pressure reduction.

While garlic is not a pharmacological ACE inhibitor like enalapril, its components may act as mild natural modulators of this system.

Increased nitric oxide synthesis:

Active substances in fermented garlic stimulate endothelial nitric oxide synthase (eNOS), enhancing NO production – a potent endogenous vasodilator. NO dilates blood vessels, reduces vascular resistance, and improves tissue perfusion, contributing directly to blood pressure regulation.

Antioxidant and antiatherogenic effect:

SAC and other antioxidants in fermented garlic neutralize free radicals and inhibit LDL cholesterol oxidation, a key step in atherosclerotic plaque formation.

Garlic has also been shown to improve the lipid profile by lowering total and LDL cholesterol and increasing HDL cholesterol.

These effects together help prevent and slow atherosclerosis, reducing cardiac workload and coronary disease risk.

Multiple randomized clinical trials have demonstrated that regular supplementation with fermented garlic can significantly lower systolic and diastolic blood pressure, especially in patients with untreated or mild hypertension. Positive effects on endothelial function and serum lipid status have also been observed.

BLACK GARLIC CARDIO PLUS

Phytotherapeutic Support for Blood Pressure Regulation and Cardiac Function

Hawthorn (Crataegus spp.)

Hawthorn is a perennial plant from the Rosaceae family, whose extracts – particularly from leaves and flowers – are used traditionally and in modern phytotherapy for cardiovascular diseases. Standardized hawthorn extracts contain significant amounts of flavonoids (such as hyperoside, rutin, vitexin) and oligomeric procyanidins responsible for its cardioprotective effects. Its use is especially beneficial in mild to moderate heart failure and arterial hypertension, particularly in early disease stages.

Mechanisms of action

Positive inotropic and negative chronotropic effects: Flavonoid components of hawthorn influence calcium flux in myocardial cells, increasing heart contractility (positive inotropy) without increasing oxygen consumption. This is crucial in heart failure where myocardial energy efficiency is important.

Simultaneously, hawthorn slows the heart rate (negative chronotropic effect), reducing cardiac workload and prolonging diastole – the phase during which the heart muscle receives blood.

Vasodilation and reduced peripheral vascular resistance: Hawthorn extracts relax vascular smooth muscle partly through increased cAMP and cGMP concentrations, leading to arterial and arteriole dilation.

This results in lowered peripheral resistance and arterial blood pressure while preserving cerebral and coronary perfusion.

Antioxidant and endothelial protective properties: Hawthorn bioactive compounds have strong antioxidant activity, neutralizing reactive oxygen species (ROS) and reducing oxidative damage in the myocardium.

Positive effects on endothelial function, including increased NO bioavailability, further enhance vasodilation and vascular reactivity.

Numerous clinical studies have shown standardized hawthorn extracts significantly improve symptoms of NYHA class II and III heart failure, including reduced dyspnea, improved exercise tolerance, and decreased

European Mistletoe (Viscum album)

European mistletoe is a semi-parasitic plant from the Santalaceae family, traditionally used in European phytotherapy for the treatment of cardiovascular and neurovegetative disorders. The active substances present in mistletoe extract include lectins (mistletoe lectins), viscotoxins, flavonoids, polysaccharides, and triterpenes, many of which are associated with immunomodulatory, hypotensive, and sedative effects. Its action in the context of hypertension and heart failure results from multiple interconnected mechanisms.

Mechanisms of action

Antihypertensive effect: Mistletoe extracts show mild hypotensive effects, achieved by modulating the autonomic nervous system—especially through inhibition of sympathetic activity and enhancement of parasympathetic tone.

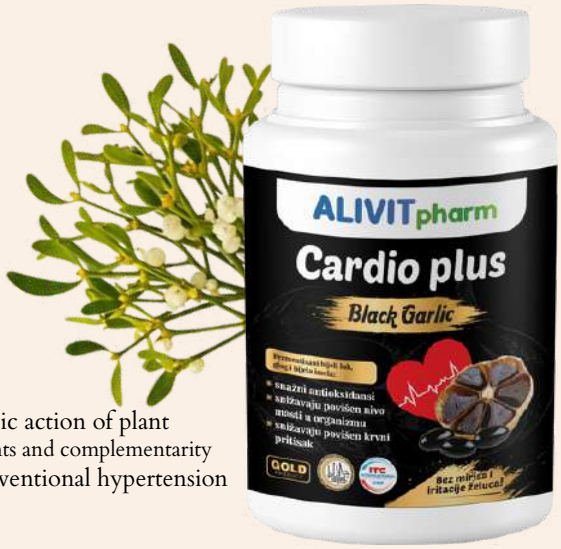
Experimental studies have shown that mistletoe can reduce arterial pressure by acting directly on vasomotor centers in the central nervous system, as well as peripherally through relaxation of the smooth muscles of blood vessels.

Improvement of peripheral circulation and microcirculation: Mistletoe may contribute to the dilation of peripheral blood vessels, thereby increasing tissue perfusion, especially in the extremities and peripheral organs. This reduces the heart's workload, which is beneficial for patients with heart failure and hypertension, where reduced circulatory efficiency is a common problem.

Sedative and anxiolytic effect: Polysaccharides and other bioactive compounds from mistletoe have demonstrated mild sedative and calming effects in various phytotherapeutic models, which can be significant for patients with stress-induced hypertension or psychovegetative disorders.

Reducing mental tension and anxiety positively affects blood pressure regulation through decreased activation of the sympathetic nervous system.

The use of mistletoe-based preparations in modern phytotherapy is most studied in oncology (as an immunoadjuvant), but its cardiovascular application finds a place as adjunct therapy in borderline hypertension and neurocardiogenic disorders. It is particularly useful in elderly patients with increased sensitivity to psychosomatic factors and those intolerant to more aggressive pharmacotherapy.



Synergistic action of plant components and complementarity with conventional hypertension therapy

The BLACK GARLIC CARDIO PLUS preparation contains three phytotherapeutically active components—fermented garlic (Allium sativum), hawthorn (Crataegus spp.), and European mistletoe (Viscum album)—which functionally complement each other in modulating key mechanisms of hypertension and heart failure. Their synergy is reflected in a multilayered effect on vascular tone, myocardial function, autonomic regulation, and oxidative status of the organism

Multimechanistic approach to blood pressure regulation

Hemodynamic synergy:

Fermented garlic and hawthorn jointly reduce peripheral vascular resistance, garlic by increasing nitric oxide and potential ACE inhibition, hawthorn through direct vasodilation mediated by flavonoids.

Hawthorn further improves cardiac efficiency (positive inotropic effect), while mistletoe reduces sympathetic activation, contributing to overall stabilization of arterial pressure.

Antioxidant and anti-atherogenic protection:

All components possess strong antioxidant properties, protecting the endothelium and myocardium from damage caused by reactive oxygen species (ROS).

Fermented garlic stands out in preventing LDL cholesterol oxidation, contributing to atherosclerosis prevention—one of the key etiological factors in hypertension.

Neurovegetative regulation:

Mistletoe, with its mild sedative and anxiolytic effects, is especially important for patients whose hypertension is largely conditioned by psychosomatic factors, stress, and autonomic nervous system imbalance.

Complementarity with conventional antihypertensive therapy

The use of herbal preparations like BLACK GARLIC CARDIO PLUS as part of a comprehensive therapeutic approach to hypertension and heart failure is not a substitute for pharmacological treatment but an adjunct that can improve clinical response and patients' quality of life.

Potential benefits of complementary use

Better blood pressure control in patients with borderline or resistant hypertension.

Dose reduction of conventional drugs in patients with mild hypertension, under medical supervision.

Mitigation of drug side effects, especially in elderly patients (e.g., antioxidant myocardial protection, improved exercise tolerance).

Safety considerations

No significant evidence exists for serious interactions between these herbal ingredients and standard antihypertensives (ACE inhibitors, beta-blockers, diuretics), but consultation with a physician is recommended, especially for patients on multiple drugs or with comorbidities.

The synergistic effect of fermented garlic, hawthorn, and mistletoe provides multifactorial support for arterial pressure regulation, with additional benefits in myocardial protection, improved circulation, and reduced oxidative stress. As a complement to pharmacotherapy, BLACK GARLIC CARDIO PLUS may contribute to more effective and individualized hypertension therapy, especially in patients with increased metabolic and neurovegetative regulatory demands.

BLACK GARLIC CARDIO PLUS

Phytotherapeutic Support for Blood Pressure Regulation and Cardiac Function

Therapeutic challenge in treating atherosclerosis (LDL – HDL BALANCE)

Atherosclerosis is one of the main causes of cardiovascular diseases, which globally are leading causes of mortality. This disease is characterized by gradual accumulation of lipid deposits, especially LDL cholesterol, in the inner lining of blood vessels, triggering a cascade of pathological processes including inflammation, intimal cell proliferation, formation of atherosclerotic plaques, and increased vascular stiffness. Consequently, there is a reduction in blood vessel lumen, arterial narrowing, and occlusion, resulting in decreased blood flow. Coronary artery occlusion can cause myocardial infarction, while occlusion of arteries supplying the brain may lead to stroke, and peripheral artery narrowing is associated with peripheral artery disease. These processes greatly increase the risk of serious cardiovascular events, making atherosclerosis a leading cause of disease and death in modern society.

Pathophysiology of atherosclerosis: oxidative stress and inflammatory reactions

Key factors in atherosclerosis development are oxidative stress and inflammatory processes. Oxidation of LDL cholesterol (LDL-C) plays a central role in initiating the atherosclerotic process. Oxidized LDL (oxLDL) stimulates activation of endothelial cells and phagocytosis by macrophages, leading to plaque formation. OxLDL triggers an inflammatory reaction within the vascular endothelium, causing secretion of pro-inflammatory cytokines such as interleukins (IL-1, IL-6) and tumor necrosis factor-alpha (TNF-α), which further worsen vascular dysfunction. These inflammatory processes stimulate proliferation of smooth muscle cells and fibroblasts and formation of a fibrous cap around the plaque, which may stabilize or destabilize the plaque, and rupture can cause thrombosis and vascular complications.
Besides LDL oxidation, reduction of HDL cholesterol (good cholesterol) levels contributes to atherosclerosis progression. HDL-C has a protective role by removing LDL cholesterol from the arterial wall and transporting it to the liver for degradation. Low HDL-C levels reduce this protection and may increase lipid accumulation in arteries, promoting atherosclerotic lesion formation.

Integration of pharmacological approaches and control of oxidative stress and inflammation

Modern therapeutic approaches to treating atherosclerosis include pharmacological treatments aimed at reducing LDL-C levels (statins, ezetimibe), increasing HDL-C (e.g., fibrates, niacin), as well as drugs targeting inflammation and oxidative stress control (e.g., anti-inflammatory drugs, antioxidants). Blood pressure control, diet, physical activity, and other lifestyle factors are additional components of therapy that can significantly influence disease progression.

Phytotherapy in the Treatment of Atherosclerosis: A Complementary Therapeutic Approach

Besides conventional pharmacotherapy, phytotherapy is increasingly recognized as an important complementary approach in the prevention and treatment of atherosclerosis. Phytotherapeutic preparations, rich in antioxidants, polyphenols, and other bioactive compounds, can modulate key pathophysiological processes involved in the development of atherosclerosis. Considering the widespread increase in oxidative stress and inflammatory reactions in patients with atherosclerosis, phytotherapy is used as an adjunct to control these factors and improve overall vascular health.

Synergistic action of plant components and complementarity with conventional hypertension therapy

Key Mechanisms of Phytotherapy in the Prevention and Treatment of Atherosclerosis

Reduction of LDL Cholesterol Oxidation

The oxidation of LDL cholesterol plays a significant role in the formation of atherosclerotic plaques. Herbal agents with antioxidant properties, including flavonoids, polyphenols, and vitamins C and E, can neutralize free radicals and inhibit the oxidation of LDL particles. This process helps reduce the development of atherosclerosis and prevents further damage to the vascular endothelium.
Natural antioxidants play a crucial role in inhibiting the oxidative modification of LDL particles.

Increase in HDL Cholesterol Levels

Phytotherapeutic preparations that contain bioactive components such as plant sterols and triterpenoids have shown promise in supporting lipid balance, particularly by increasing levels of high-density lipoprotein (HDL) cholesterol. Elevated HDL levels are beneficial because HDL particles play a crucial role in reverse cholesterol transport, which is the process of removing excess low-density lipoprotein (LDL) cholesterol from peripheral tissues and arterial walls and transporting it back to the liver for excretion.

Reduction of Inflammatory Processes

Inflammation is a central mechanism in the development of atherosclerotic lesions. Phytotherapy can inhibit key inflammatory markers such as C-reactive protein (CRP), interleukins (IL-1, IL-6), TNF-α, and enzymes like cyclooxygenase (COX-2), which play significant roles in inflammatory processes. In this way, phytotherapy helps reduce vascular inflammation and prevents the progression of atherosclerosis.

Improvement of Vascular Function

Inflammation is a central mechanism in the development of atherosclerotic lesions. Phytotherapy can inhibit key inflammatory markers such as C-reactive protein (CRP), interleukins (IL-1, IL-6), TNF-α, and enzymes like cyclooxygenase (COX-2), which play significant roles in inflammatory processes. In this way, phytotherapy helps reduce vascular inflammation and prevents the progression of atherosclerosis.

In treating atherosclerosis, it is necessary to apply a comprehensive approach that includes pharmacological treatments, lifestyle modification, and complementary therapeutic methods such as phytotherapy. Phytotherapy is increasingly recognized as an effective adjuvant due to its abilities to reduce oxidative stress, modulate inflammatory processes, and improve vascular function. Integrating herbal preparations into the therapeutic plan can contribute to improved long-term health outcomes, reduced risk of cardiovascular events, and preservation of vascular health, with minimal risk of adverse effects. The use of phytotherapy as a complementary approach in atherosclerosis treatment can significantly enhance patients' quality of life, especially when optimizing control of oxidative stress, inflammation, and lipid profile is required.

Aterostop targets the root causes of atherosclerosis by regulating blood lipids, reducing oxidative stress, and supporting vascular integrity—naturally and effectively.

Phytotherapeutic Role of BLACK GARLIC ATEROSTOP in the Prevention and Treatment of Atherosclerosis

The preparation BLACK GARLIC ATEROSTOP contains standardized extracts of fermented garlic (Allium sativum), wild garlic leaves (Allium ursinum), hawthorn leaves and flowers (Crataegus monogyna and Crataegus laevigata), and lemon balm leaves (Melissa officinalis). BLACK GARLIC ATEROSTOP represents an ideal natural choice for normalizing the LDL to HDL cholesterol ratio, which is one of the key factors in preventing and slowing the progression of atherosclerosis. This synergistic formulation represents a comprehensive phytotherapeutic approach to supporting the cardiovascular system through antioxidant, hypolipidemic, antihypertensive, cardioactive, and sedative effects, with a special focus on preventing and slowing the development of atherosclerotic changes.

Phytopharmacological Properties and Clinically Relevant Mechanisms in Cardiovascular Disease Prevention

Fermented Garlic (Black Garlic – Allium sativum, Fermented Form)

Fermented garlic, also known as black garlic, is produced by a controlled fermentation process of fresh garlic at elevated temperatures and high humidity over several weeks. This biotransformation results in significant chemical changes, forming more stable and pharmacologically potent metabolites, the most important being S-allyl-L-cysteine (SAC) — a water-soluble amino acid with exceptional antioxidant and anti-inflammatory properties.

Thanks to its unique chemical profile, fermented garlic possesses pronounced cardioprotective potential, confirmed by clinical and experimental studies. The most important mechanisms of its action in the context of prevention and support of therapy for atherosclerosis and associated cardiovascular conditions include:

Inhibition of LDL Cholesterol Oxidation

S-allyl-L-cysteine and other organosulfur derivatives inhibit lipid peroxidation and the formation of oxidized LDL (oxLDL) particles, which play a key role in initiating and progressing atherosclerosis. Oxidized LDL acts proinflammatorily and chemotactically on monocytes, leading to their accumulation in the subendothelial space and the formation of foam cells, a fundamental element in atheroma development.

Clinical significance**:** Inhibition of LDL oxidation is one of the strongest preventive strategies to slow atherogenesis.

Regulation of Lipid Profile Fermented garlic beneficially affects plasma lipid parameters through multiple mechanisms: reduction of total cholesterol and LDL fraction, decrease in triglycerides, increase in HDL cholesterol, which protects by enabling reverse cholesterol transport from peripheral tissues to the liver.

These changes result from the combined effects of SAC and flavonoid components that modulate the expression of enzymes involved in lipid metabolism (e.g., HMG-CoA reductase) and regulation of lipoprotein receptors.

Increase of Nitric Oxide (NO) Bioavailability

SAC stimulates the expression of endothelial nitric oxide synthase (eNOS), increasing NO production—a molecule crucial for maintaining vascular tone and endothelial function. It also prevents enzymatic and free radical degradation of NO, thereby further increasing its bioavailability.

Effect: Improved NO synthesis and preservation directly lead to vasodilation, reduced arterial pressure, and better microcirculation, which is essential for patients with endothelial dysfunction and early stages of atherosclerosis.

Antihypertensive Effect:

Fermented garlic lowers peripheral vascular resistance via endothelium-dependent and independent mechanisms. Besides increasing NO, it positively influences vascular elasticity and reduces angiotensin II concentration, further contributing to vascular tension reduction.

Lemon balm leaf (Melissa officinalis L.)

Phytotherapeutic profile and role in cardiovascular health

Lemon balm (Melissa officinalis), a member of the Lamiaceae family, is a plant with a long tradition of use in phytotherapy due to its pronounced sedative, anxiolytic, and cardioregulatory properties. It is rich in bioactive compounds, primarily flavonoids, phenolic acids (such as rosmarinic and caffeic acid), and essential oils (e.g., citral, geranial), which collectively contribute to its favorable pharmacological profile.

Its positive effects on the cardiovascular system are achieved through several interconnected mechanisms:

Sedative and cardioregulatory action

Lemon balm has a calming effect on the sympathetic nervous system, leading to a mild reduction in arterial blood pressure and slowing of heart rate. These effects result from its influence on central GABAergic pathways as well as regulation of adrenal activity. By reducing sympathetic activity, lemon balm improves autonomic balance, which is particularly important for patients with hypertension, tachycardia, and stress-induced cardiovascular disorders.

Antioxidant protection of endothelial function

Phenolic components of lemon balm exhibit strong antioxidant activity, neutralizing free radicals and protecting endothelial cells from oxidative damage. A healthy endothelium is crucial for proper vascular function, regulation of vascular tone, and prevention of atherosclerotic changes. Lemon balm's antioxidant effect helps preserve the integrity of the vascular wall and reduce inflammatory processes in circulation.

Anxiolytic effect and support of neurocardiovascular regulation

Lemon balm significantly improves sleep quality and reduces anxiety, indirectly benefiting the cardiovascular system. Chronic stress and sleep disorders increase neuroendocrine stimulation, particularly via activation of the hypothalamic-pituitary-adrenal (HPA) axis, resulting in increased secretion of cortisol and catecholamines. These hormones further burden the heart and blood vessels, accelerating cardiovascular disease progression. Lemon balm, as a natural regulator of neurovegetative activity, helps interrupt this pathological cycle.

Lemon balm leaf (Melissa officinalis), through its sedative, antioxidant, and anxiolytic effects, provides multifaceted support to cardiovascular health. By calming the sympathetic nervous system, protecting endothelial function, and reducing psychophysical stress, lemon balm is an important phytotherapeutic agent in the prevention and complementary therapy of cardiovascular diseases, especially those associated with stress, anxiety, and hypertension.

Phytopharmacological Properties and Clinically Relevant Mechanisms in Cardiovascular Disease Prevention

Wild Garlic (Allium ursinum)
Cardioprotective Profile and Mechanisms of Action

Wild garlic, also known as ramson, is a plant used in traditional medicine for its remarkable health benefits. Rich in bioactive compounds such as organic sulfur compounds, flavonoids, and adenosine, wild garlic exhibits significant therapeutic effects on the human body. Its cardioprotective effect, which includes blood pressure regulation, lipid profile improvement, thrombosis prevention, and anti-inflammatory action, makes it important in cardiovascular disease prevention.

Lowering Arterial Blood Pressure

Wild garlic acts on blood pressure through two key mechanisms: vasodilation and diuresis. This dual effect results in decreased resistance in blood vessels and increased excretion of excess fluid from the body.

Vasodilation: Wild garlic uses organic sulfur compounds, such as allyl propyl disulfide, which help relax smooth muscles in blood vessels. This relaxation allows blood vessels to widen, reducing overall vascular resistance and lowering blood pressure. This effect is particularly beneficial for patients suffering from hypertension.

Diuresis: Wild garlic also promotes excretion of excess fluid through the kidneys. The diuretic effect reduces blood volume, thereby lowering pressure on vessel walls and blood pressure. This mechanism is particularly useful in controlling hypertension and reducing heart workload.

Improvement of Lipid Profile

Wild garlic has hypolipidemic properties, contributing to balancing lipid levels in the blood. Its mechanism includes reducing harmful LDL (low-density lipoprotein) cholesterol and triglyceride concentrations, while increasing HDL (high-density lipoprotein) cholesterol levels.

Reduction of LDL cholesterol: Saponins and flavonoids like quercetin in wild garlic can reduce absorption and production of LDL cholesterol in the liver. LDL is known as "bad" cholesterol because it accumulates on vessel walls and contributes to atherosclerosis.

Increase of HDL cholesterol: HDL, known as "good" cholesterol, plays a key role in removing excess cholesterol from blood vessels and returning it to the liver for breakdown. Wild garlic helps stimulate HDL production, reducing the risk of heart disease.

Anti-aggregatory Effect

One of wild garlic's strongest cardioprotective effects is its ability to inhibit platelet aggregation. Platelets are blood cells responsible for clot formation. When activated, they stick to damaged vessel parts, potentially leading to thrombosis and myocardial infarction or stroke.

Sulfur compounds: Wild garlic contains organic sulfur compounds that directly affect platelets. These compounds prevent platelet activation, reducing their ability to clump and form clots. This anti-aggregatory effect is especially useful in thrombosis prevention, a key factor in cardiovascular disease development.

Prevention of atherothrombotic complications: Besides preventing thrombosis, wild garlic reduces the risk of atherothrombotic complications, which occur when atherosclerotic plaques combine with platelets and form clots that can block vessels, causing heart attacks or strokes.

Antioxidant and Anti-inflammatory Effects

Wild garlic is rich in flavonoids and vitamins such as C and E, which have strong antioxidant properties. These phytonutrients reduce oxidative stress, the main cause of endothelial cell damage (cells lining blood vessels).

Reduction of oxidative stress: Free radicals, generated by metabolism and environmental exposure, can damage the endothelium. Antioxidants in wild garlic neutralize these free radicals, preventing vessel damage and reducing atherosclerosis risk.

Anti-inflammatory effect: Flavonoids like quercetin also act as anti-inflammatory agents, reducing inflammation in blood vessels. Chronic inflammation is a key factor in cardiovascular disease development. Wild garlic reduces inflammatory processes and helps maintain vessel health, lowering cardiovascular risk.

Wild garlic (Allium ursinum) is a plant with exceptional cardioprotective properties based on complex biological mechanisms. Through vasodilation and diuresis, reduction of LDL cholesterol and increase of HDL, as well as anti-aggregatory and anti-inflammatory actions, wild garlic represents a natural tool for cardiovascular disease prevention. Its broad therapeutic properties make it useful in maintaining heart and vessel health and reducing the risk of serious cardiovascular events such as heart attack and stroke.

Hawthorn leaf and flower

(Crataegus monogyna, Crataegus laevigata)

Phytotherapeutic standard in cardiovascular prevention and therapy

Hawthorn, in the form of leaf and flower extract, is one of the most systematically researched plants in the field of phytocardiology. Its use is approved in modern medical phytotherapy, especially in the treatment of mild to moderate forms of chronic heart failure (NYHA stages I–II), as well as in angina pectoris and functional heart complaints.

The pharmacological activity of hawthorn results from the synergistic effect of several groups of bioactive compounds, among which the following stand out:
Oligomeric procyanidins (OPC), the primary carriers of cardioprotective effects, known for their ability to stabilize the vascular endothelium and improve coronary perfusion.
Flavonoids – especially hyperoside, vitexin, and their derivatives, with pronounced antioxidant, vasodilatory, and antiarrhythmic properties.
Triterpenic acids – contributing anti-inflammatory and mild sedative effects, useful in regulating blood pressure.

Hawthorn (Crataegus spp.) is a highly effective and safe phytotherapeutic agent with multifactorial cardioprotective action. Through positive inotropic effect, improved coronary perfusion, rhythm stabilization, antioxidant protection, and blood pressure regulation, hawthorn ranks among the strategic plants in the prevention and complementary therapy of chronic heart failure, angina pectoris, cardiac arrhythmias, and early forms of hypertension. Its efficacy and safety profile is confirmed by numerous clinical studies and guidelines from the European Medicines Agency (EMA – HMPC).

Key mechanisms of action in cardiovascular protection:

Positive inotropic effect – improving myocardial contractility

Hawthorn extracts show a mild positive inotropic effect, i.e., they increase the strength of heart muscle contractions without simultaneously increasing oxygen consumption. This is extremely important in heart failure because it improves cardiac output and circulation while preserving myocardial energy balance. The mechanism includes inhibition of Na^+/K^+-ATPase and modulation of intracellular Ca^{2+}.

Coronary artery vasodilation – improved perfusion and oxygenation

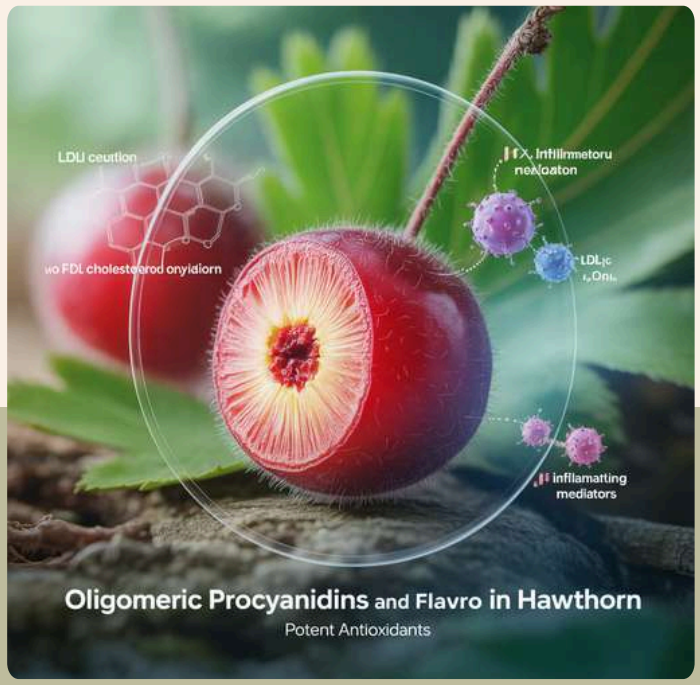
Flavonoids and OPCs present in hawthorn induce endothelium-dependent and independent vasodilation, especially in coronary arteries, thereby improving myocardial perfusion and increasing oxygen delivery to the heart muscle. This effect is clinically significant in the prevention and treatment of angina pectoris, particularly in patients with reduced coronary reserve.

Stabilization of heart rhythm and regulation of blood pressure

Hawthorn has a mild antiarrhythmic potential due to its effects on ion channels, especially K^+ and Ca^{2+} channels in the heart muscle. This contributes to stabilizing the heart rhythm and reducing episodes of ventricular and supraventricular arrhythmias. Hawthorn also normalizes arterial blood pressure, showing a dual effect – mildly hypotensive in hypertensive patients and normotensive in people with low blood pressure, indicating an adaptogenic potential in hemodynamic regulation

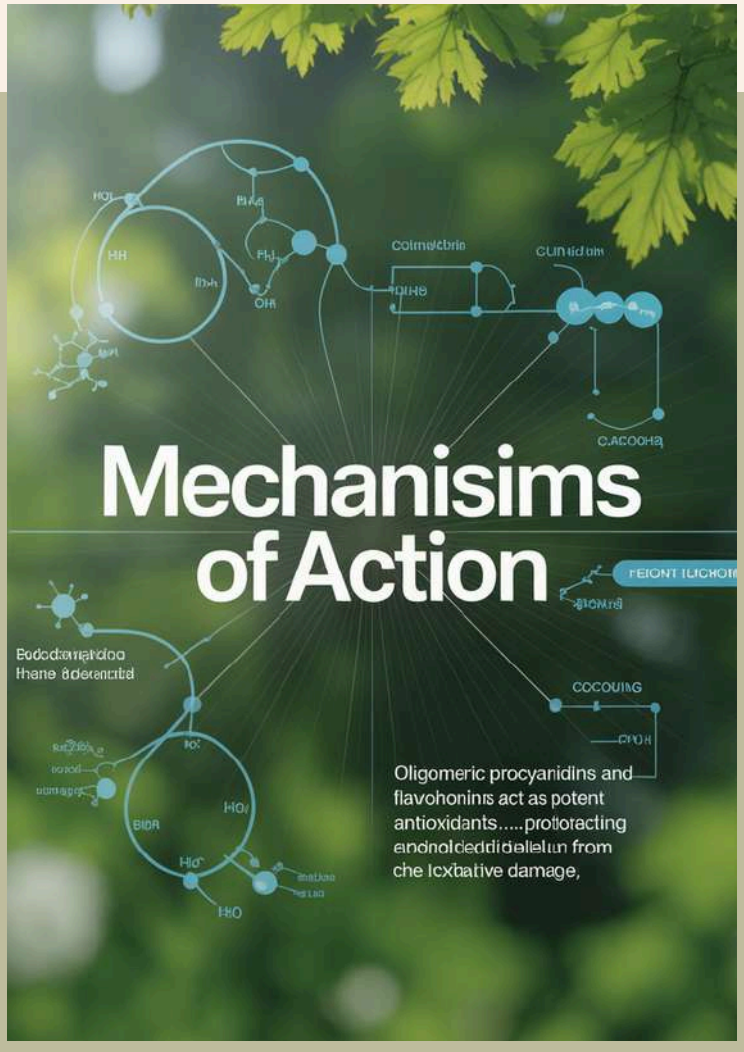
Antioxidant and anti-inflammatory action – stabilization of atherosclerotic plaques

Oligomeric procyanidins and flavonoids in hawthorn act as potent antioxidants, reducing LDL cholesterol oxidation, inhibiting inflammatory mediators (e.g., TNF-α, IL-6), and protecting the endothelium from chronic oxidative damage. In this way, hawthorn contributes to the stabilization of atherosclerotic plaques, which is crucial in preventing their rupture and the development of acute coronary syndromes.



Mechanisms of action of BLACK GARLIC ATEROSTOP in key stages of the atherosclerotic process

Atherogenesis Stage	Mechanism of Action
LDL Oxidation	Inhibition of lipid peroxidation (fermented garlic, wild garlic)
Endothelial Dysfunction	Enhancement of nitric oxide synthesis and vascular relaxation (garlic, hawthorn)
Inflammation	Antioxidant and anti-inflammatory effects (hawthorn, wild garlic)
Lipid Imbalance	LDL and triglyceride reduction; HDL increase (garlic, wild garlic)
Hemodynamic Stress	Blood pressure and heart rate reduction (hawthorn, lemon balm)
Microcirculation & Perfusion	mproved coronary blood flow and vasodilation (hawthorn)
Thrombosis Risk	Antiplatelet (antiaggregatory) effects (wild garlic, garlic)



Clinical significance: Long-term use of fermented garlic leads to mild but stable reductions in systolic and diastolic blood pressure, especially in patients with borderline hypertension or metabolic syndrome. Fermented garlic (Allium sativum, fermented form) represents a phytopharmacologically superior alternative to fresh garlic, with higher bioavailability and better gastrointestinal tolerance. Its clinically significant mechanisms of action, including inhibition of LDL oxidation, lipid profile normalization, increased nitric oxide synthesis, and antihypertensive effect, classify it as a valuable complementary agent in the prevention and therapy of cardiovascular diseases, especially atherosclerosis and its complications. Its safety and efficacy profile makes it suitable for long-term use, particularly in populations at elevated cardiovascular risk. These mechanisms collectively contribute to preserving vascular endothelial integrity, reducing oxidative stress and inflammation, significantly influencing the prevention and slowing of atherosclerotic changes.

Importance of liver function for cardiovascular system health

The liver plays a fundamental role in maintaining metabolic and cardiovascular balance. Its impact extends through several physiological systems that directly influence cardiovascular risk factors and disease development.

Cholesterol and Lipid Metabolism
The liver regulates the production, uptake, and clearance of cholesterol and lipoproteins, including LDL and HDL. Liver dysfunction can lead to dyslipidemia, one of the major contributors to atherosclerosis and coronary artery disease.

Glucose Metabolism and Insulin Sensitivity
The liver maintains glycemic control through glycogenesis, gluconeogenesis, and glycogenolysis. In conditions such as non-alcoholic fatty liver disease (NAFLD), hepatic insulin resistance develops, contributing to metabolic syndrome and increasing cardiovascular risk.

Inflammation and Oxidative Stress
Chronic liver inflammation triggers the release of pro-inflammatory cytokines (e.g., TNF-α, IL-6), leading to endothelial dysfunction and promoting atherogenesis. Diseases like NAFLD and cirrhosis elevate systemic inflammation, a key mechanism in cardiovascular disease progression.

Coagulation and Hemostasis
The liver synthesizes most of the body's coagulation factors and natural anticoagulants. Impaired liver function can disrupt this balance, resulting in either increased thrombotic risk (e.g., stroke, infarction) or bleeding tendencies, depending on the stage and type of dysfunction.

Bile Acid Metabolism and Gut–Vascular Interaction
Liver-derived bile acids aid in lipid digestion and modulate the gut microbiota, influencing vascular health, immune regulation, and inflammatory pathways. Disruptions in bile acid homeostasis are increasingly recognized as contributors to cardiometabolic disorders.

Hepato Care:

Help your liver stay healthy and support the cardiovascular system with synergistic plant extracts and fermented garlic

Fermented garlic oil extract (Allium sativum)

is recognized for its potent hepatoprotective properties and its significant role in supporting cardiovascular health. Through its antioxidant, anti-inflammatory, and hypolipidemic effects, fermented garlic provides comprehensive benefits for both the liver and the heart.
One of its key bioactive compounds, S-allyl-cysteine (SAC), offers powerful antioxidant protection. SAC helps shield liver cells (hepatocytes) from oxidative stress while also neutralizing free radicals within blood vessels, thereby reducing inflammation and lowering the risk of atherosclerosis.
Fermented garlic also promotes the synthesis of glutathione, a crucial antioxidant involved in liver detoxification. This action enhances the liver's ability to regulate lipids and helps prevent the accumulation of LDL cholesterol.
Furthermore, fermented garlic supports the regulation of liver enzymes such as ALT and AST, which reflects improved metabolic health. This contributes to more effective management of blood glucose, lipid levels, and systemic inflammation—key elements in the prevention of cardiovascular disease.
When used in combination with other medicinal plant extracts like roseroot, yarrow, and immortelle, fermented garlic demonstrates a synergistic effect. This combination amplifies its anti-inflammatory and circulatory benefits, offering additional support for the heart and vascular system.

Oil extract of dandelion root (Taraxacum officinale)

offers a range of benefits for both liver and cardiovascular health. Widely used in supportive formulas, dandelion promotes liver regeneration and detoxification, making it valuable in maintaining optimal liver function.
By helping to lower total cholesterol and triglyceride levels, dandelion improves the lipid profile and plays a key role in addressing fatty liver—particularly in individuals affected by metabolic syndrome, which is closely linked to an elevated risk of heart disease.
In addition to its lipid-regulating effects, dandelion contributes to healthier glycoregulation, helping to prevent vascular complications commonly associated with diabetes. Its strong antioxidant and anti-inflammatory properties provide further protection for blood vessels, shielding them from oxidative stress and chronic inflammation.

Oil extract of yarrow aerial parts (Achillea millefolium)

is a valuable component in formulations aimed at protecting both the liver and the cardiovascular system, thanks to its dual therapeutic effects.
Yarrow is rich in flavonoids, sesquiterpene lactones, and chlorogenic acid, compounds known for their strong antioxidant properties. By effectively neutralizing free radicals, it helps reduce oxidative stress—a common factor in the development of liver conditions such as NAFLD, hepatitis, and cirrhosis, as well as vascular diseases like atherosclerosis.
Its anti-inflammatory effects are also significant. Yarrow helps suppress key pro-inflammatory cytokines, including TNF-α, IL-1β, and IL-6, offering protection to both hepatocytes and the vascular endothelium.
In addition, yarrow supports healthy liver enzyme activity and stimulates bile secretion, enhancing detoxification processes and improving lipid metabolism. This contributes to a reduction in systemic inflammation and supports overall metabolic and cardiovascular balance.

Hepato Care: Supporting Liver Health with Herbal Extracts

Help your liver stay healthy and support the cardiovascular system with synergistic plant extracts and fermented garlic

Oil extract of immortelle aerial parts (Helichrysum italicum)

offers potent hepatoprotective and cardiovascular benefits, making it a valuable ingredient in formulations targeting liver and vascular health. Its bioactive compounds—flavonoids, acetophenones, and phloroglucinols—exhibit strong antioxidant activity, effectively reducing oxidative stress that contributes to liver fibrosis and vascular damage.

Immortelle also helps modulate inflammatory responses by inhibiting the NF-κB signaling pathway and decreasing the secretion of pro-inflammatory cytokines such as TNF-α and IL-1β. This dual action alleviates chronic liver inflammation and helps prevent endothelial dysfunction and the progression of vascular disease.

By stimulating bile secretion, immortelle enhances the liver's detoxification capacity and supports healthy fat metabolism. Its membrane-stabilizing properties provide direct protection to hepatocytes, while its systemic antioxidant and anti-inflammatory effects contribute to lowering the overall risk of cardiovascular disease.

B-complex vitamins (B2, B6, B12, and folate)

play a vital role in maintaining both liver and cardiovascular health through multiple synergistic mechanisms.

These vitamins are essential for sustaining glutathione activity and the function of detoxification enzymes, which helps reduce oxidative stress and supports the liver's ability to neutralize harmful substances. By enhancing the activity of liver enzymes involved in phases I and II of detoxification, B-complex vitamins contribute directly to efficient metabolic processing.

They also assist in fat metabolism and energy production, which helps prevent the accumulation of fat in liver tissue—a key factor in the development of fatty liver disease. In parallel, their role in methylation and the regulation of homocysteine levels supports reduced inflammation in the liver and lowers the risk of vascular damage.

Moreover, B vitamins are involved in processes that promote liver cell regeneration, making them crucial for maintaining long-term liver function and resilience.

Vitamin E

is a fat-soluble antioxidant known for its strong protective effects on the liver, particularly in conditions characterized by oxidative stress, such as non-alcoholic fatty liver disease (NAFLD) and non-alcoholic steatohepatitis (NASH).

Its primary action involves neutralizing free radicals, thereby preserving the integrity of liver cells and preventing oxidative damage. Additionally, by inhibiting pro-inflammatory cytokines, vitamin E helps reduce chronic inflammation, which in turn slows the progression of liver disease and supports overall liver function.

Synergistic Herbal Formula for Liver and Cardiovascular Wellness

Restoring Liver Balance to Support Whole-Body Health

Hepato Care not only supports liver detoxification and regeneration but also plays a crucial role in cardiovascular health. By improving lipid metabolism and reducing systemic inflammation through enhanced liver function, it helps lower the risk factors associated with atherosclerosis, hypertension, and other cardiovascular diseases. This holistic support reflects the vital interconnection between liver health and the cardiovascular system, making Hepato Care an integral part of comprehensive cardiometabolic wellness.

Hepato Care provides comprehensive support for liver health by promoting detoxification, enhancing antioxidant defenses, and improving bile secretion. Its carefully selected herbal components work synergistically to protect hepatocytes from oxidative damage and inflammation.

Maintaining optimal liver health is essential for overall well-being, as the liver plays a central role in metabolism, detoxification, and systemic homeostasis. In the face of rising liver disease incidence particularly non-alcoholic fatty liver disease (NAFLD), there is growing interest in safe, effective, and integrative therapeutic strategies.

Phytotherapy represents a valuable approach in liver care, offering hepatoprotective, anti-inflammatory, and antioxidant benefits with minimal side effects. The Hepato Care formulation, combining fermented garlic oil with dandelion root, yarrow, immortelle, and essential vitamins, provides a comprehensive support system for liver function. Each ingredient contributes synergistically: fermented garlic enhances liver detoxification and regeneration; dandelion and immortelle stimulate bile flow and combat oxidative stress; yarrow offers enzymatic regulation and anti-inflammatory activity; while B-complex vitamins and vitamin E further strengthen the liver's antioxidant defenses and metabolic capacity.

This multi-targeted herbal approach not only supports liver enzyme balance and cellular protection but also addresses broader metabolic and inflammatory pathways associated with chronic liver conditions. As scientific understanding of the gut–liver axis and phytotherapeutic mechanisms evolves, liver support supplements like Hepato Care stand as promising tools in both preventive care and the management of liver dysfunction.

Phytotherapy offers a safer alternative or adjunct to conventional therapies, with fewer side effects and the potential for long-term use in chronic conditions such as NAFLD, IBS, and SIBO.

Future clinical strategies should include plant-based formulations that act on both gastrointestinal and hepatic pathways, especially in patients with comorbid digestive and metabolic disorders.

Natural support for a healthy and resilient liver

Plant-Based Healing for the Heart, Liver, and Beyond

Phytotherapy offers a scientifically grounded, holistic approach to maintaining and improving both cardiovascular and liver health. Medicinal plant extracts, such as fermented garlic, dandelion, yarrow, and immortelle demonstrate significant therapeutic potential through their antioxidant, anti-inflammatory, hepatoprotective, and cardioprotective properties. These natural agents act on multiple levels, reducing oxidative stress, regulating lipid metabolism, supporting bile secretion, improving enzyme function, and protecting vascular integrity.

The interdependence between the liver and cardiovascular system underscores the importance of integrated therapeutic strategies. The liver plays a central role in lipid processing, detoxification, and metabolic balance, all of which directly influence cardiovascular risk. Conversely, vascular health ensures adequate oxygen and nutrient delivery, which is essential for optimal liver function.

Phytotherapeutic compounds not only target individual symptoms or markers but also work to restore physiological balance, modulate immune responses, and prevent disease progression. When combined with essential micronutrients such as B-complex vitamins and vitamin E, herbal supplements contribute to the normalization of blood pressure, cholesterol, triglycerides, and inflammatory markers, while also promoting liver regeneration and resilience.

In an era of increasing interest in integrative and preventive medicine, phytotherapy represents a valuable, evidence-informed tool that bridges traditional knowledge with modern scientific validation. It provides a personalized, low-toxicity, and long-term approach to addressing the complex interplay between liver and cardiovascular health, and holds growing potential in the prevention and adjunctive treatment of chronic metabolic and vascular conditions.

Beyond their individual biochemical effects, herbal supplements represent a systemic form of support—addressing not just symptoms but the root imbalances that contribute to chronic diseases. In the context of cardiovascular and liver health, where inflammation, oxidative stress, and metabolic dysregulation often coexist, phytotherapy offers a multi-targeted and synergistic intervention.

Modern clinical and preclinical studies increasingly validate the traditional use of medicinal plants, confirming their relevance in today's evidence-based healthcare. Fermented garlic, for example, modulates lipid metabolism and vascular tone while protecting liver cells from oxidative injury. Dandelion improves glycoregulation and combats fatty liver. Yarrow reduces endothelial inflammation and supports bile flow, while immortelle helps prevent fibrotic changes and vascular degeneration.

The strength of phytotherapy lies in its ability to restore physiological homeostasis, offering sustainable, long-term benefits without the burden of adverse effects associated with many synthetic drugs. For individuals with mild to moderate risk factors—or those seeking complementary strategies alongside conventional treatment—phytotherapy provides a safe, intelligent, and adaptable option.

As research advances and formulations are refined, the integration of phytotherapeutic protocols into mainstream prevention and care for metabolic, hepatic, and cardiovascular disorders becomes not only feasible but increasingly essential.

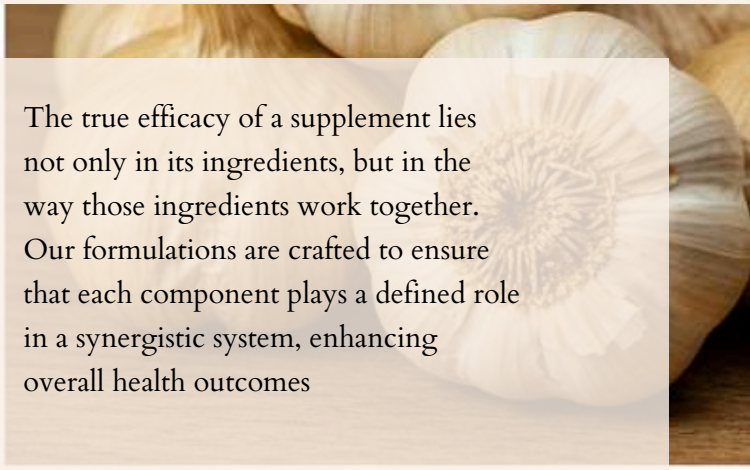
2025

SYNERGY IN SUPPLEMENTS

WHAT DOES INGREDIENT SYNERGY MEAN IN A SUPPLEMENT?

SYNERGY MEANS BETTER RESULTS WITH LOWER DOSES

SMART COMBINATIONS – THE BODY RESPONDS BETTER TO TEAMWORK THAN TO RANDOMNESS



The true efficacy of a supplement lies not only in its ingredients, but in the way those ingredients work together. Our formulations are crafted to ensure that each component plays a defined role in a synergistic system, enhancing overall health outcomes

BETTER ABSORPTION AND EFFECTIVENESS

COMPREHENSIVE ACTION ACROSS BODY SYSTEMS

REDUCED SIDE EFFECTS

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