

The Tashkent Pharmaceutical Institute

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# **Medicinal plants for the treatment of atherosclerosis**

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Atherosclerosis is a condition in which cholesterol, calcium, and other substances, collectively referred to as plaque, clog your arteries. This blocks blood flow to your vital organs, especially the heart. It sometimes gets confused with arteriosclerosis, which is a hardening of the arteries that might occur whether plaque is present or not.

Atherosclerosis leads to many health problems, including stroke, heart attack, kidney disease, and dementia. It's unclear what causes the condition, because many factors are involved. People who smoke, use excessive alcohol (more than one drink a day for women, two drinks a day for men), and don't exercise enough are more likely to develop it. You also could inherit the likelihood of developing atherosclerosis.

There are a number of supplements, many derived from plants, that could help treat atherosclerosis. Most of them do that by affecting cholesterol levels.

High levels of cholesterol aren't the only risk factor in developing atherosclerosis, but they are a significant contributor. There are two kinds of cholesterol. Low-density lipoprotein (LDL) is also known as "bad" cholesterol, and high-density lipoprotein (HDL) is known as "good" cholesterol. The goal in treating cholesterol and related problems is to keep LDL low, and raise HDL.

Atherosclerosis (also known as arteriosclerotic vascular disease or ASVD) is a specific form of arteriosclerosis in which an artery wall thickens as a result of invasion and accumulation of white blood cells (WBCs) (foam cell) and proliferation of intimal smooth muscle cell creating a fibrofatty plaque.

The accumulation of the white blood cells is termed "fatty streaks" early on because of the appearance being similar to that of marbled steak. These accumulations contain both living, active WBCs (producing inflammation) and remnants of dead cells, including cholesterol and triglycerides. The remnants eventually include calcium and other crystallized materials within the outermost and oldest plaque. The "fatty streaks" reduce the elasticity of the artery walls. However, they do not affect blood flow for decades because the artery muscular wall enlarges at the locations of plaque. The wall stiffening may eventually increase pulse pressure; widened pulse pressure is one possible result of advanced disease within the major arteries.

Atherosclerosis is therefore a syndrome affecting arterial blood vessels due to a chronic inflammatory response of WBCs in the walls of arteries. This is promoted by low-density lipoproteins (LDL, plasma proteins that carry cholesterol and triglycerides) without adequate removal of fats and cholesterol from the macrophages by functional high-density lipoproteins (HDL). It is commonly referred to as a "hardening" or furring of the arteries. It is caused by the formation of multiple atheromatous plaques within the arteries.

The atheroma ("lump of gruel", from Greek ἀθήρα (athera), meaning "gruel"), which is the nodular accumulation of a soft, flaky, yellowish material at the center of large plaques, composed of macrophages nearest the lumen of the artery

Underlying areas of cholesterol crystals

Calcification at the outer base of older or more advanced lesions.

Atherosclerosis is a chronic disease that remains asymptomatic for decades. Atherosclerotic lesions, or atherosclerotic plaques, are separated into two broad categories: Stable and unstable (also called vulnerable). The pathobiology of atherosclerotic lesions is very complicated, but generally, stable atherosclerotic plaques, which tend to be asymptomatic, are rich in extracellular matrix and smooth muscle cells. On the other hand, unstable plaques are rich in macrophages and foam cells, and the extracellular matrix separating the lesion from the arterial lumen (also known as the fibrous cap) is usually weak and prone to rupture. Ruptures of the fibrous cap expose thrombogenic material, such as collagen, to the circulation and eventually induce thrombus formation in the lumen. Upon formation, intraluminal thrombi can occlude arteries outright (e.g., coronary occlusion), but more often they detach, move into the circulation, and eventually occlude smaller downstream branches causing thromboembolism. Apart from thromboembolism, chronically expanding atherosclerotic lesions can cause complete closure of the lumen. Chronically expanding lesions are often asymptomatic until lumen stenosis is so severe (usually over 80%) that blood supply to downstream tissue(s) is insufficient, resulting in ischemia.

These complications of advanced atherosclerosis are chronic, slowly progressive and cumulative. Most commonly, soft plaque suddenly ruptures (see vulnerable plaque), causing the formation of a thrombus that will rapidly slow or stop blood flow, leading to death of the tissues fed by the artery in approximately five minutes. This catastrophic event is called an infarction. One of the most common recognized scenarios is called coronary thrombosis of a coronary artery,

causing myocardial infarction (a heart attack). The same process in an artery to the brain is commonly called stroke. Another common scenario in very advanced disease is claudication from insufficient blood supply to the legs. Atherosclerosis affects the entire artery tree, but mostly larger, high-pressure vessels such as the coronary, renal, femoral, cerebral, and carotid arteries. These are termed "clinically silent" because the person having the infarction does not notice the problem and does not seek medical help, or when they do, physicians do not recognize what has happened.



Severe atherosclerosis of the aorta. Autopsy specimen.

### 1. Artichoke Extract

This supplement is sometimes referred to as artichoke leaf extract, or ALE. [Studies indicate](#) that ALE can help raise your “good” cholesterol and lower “bad” cholesterol. Artichoke extract comes in capsules, tablets, and tinctures. How much to take depends on the type of preparation, but there isn’t any research showing that you can overdose on artichokes.



## 2. Garlic

Garlic has been credited with healing qualities for everything from breast cancer to baldness. But studies on garlic and heart health are mixed. A 2009 [review](#) of medical studies concluded that garlic does not reduce cholesterol, but a similar review from [2013](#) suggested that taking garlic could prevent heart disease. A [study](#) published in 2012 showed that aged garlic extract combined with the coenzyme Q10 slowed the progress of atherosclerosis.

In any case, garlic probably won't hurt you. Eat it raw or cooked, or take it in capsule or tablet form. The magic ingredient is allicin, which is also what makes garlic smell. That means odorless garlic supplements might not be helpful, according to the [National Institutes of Health](#).



### 3. Niacin

Niacin is also known as vitamin B-3. It's found in foods like liver, chicken, tuna, and salmon, and is also sold as a supplement. Your doctor might recommend niacin supplements to help with your cholesterol, since it can raise your "good" cholesterol levels [by a third](#), and also lower triglycerides, another fat that increases heart disease risk. Niacin supplements can make your skin flushed and prickly feeling, and might cause nausea. The [recommended amount](#) of niacin a day is 14 mg for women and 16 mg for men. Do not take more than that amount without talking to your doctor first.

### 4. Policosanol

Policosanol is an extract that is made from plants such as sugar cane and yams. An [extensive study](#) by Cuban scientists on policosanol derived from local sugar cane showed that the extract has cholesterol-reducing properties, but according to a [2010 review](#), no tests outside of Cuba have confirmed the finding. Policosanol comes in capsules.

### 5. Red Rice Yeast

Red rice yeast is a food product that is made by fermenting white rice with yeast. It is commonly used in traditional Chinese medicine. [Studies show](#) that it can significantly lower your levels of cholesterol. The power of red yeast rice lies in the substance monacolin K, which has the same makeup as lovastatin, a prescription statin drug used for lowering cholesterol.

Unfortunately, the FDA [has banned](#) red yeast rice products that are promoted to reduce cholesterol, as they contain a potentially harmful, unauthorized drug.

Some red yeast rice supplements are available but may not be effective without that key ingredient. Red rice yeast has also been [studied](#) for possible kidney, liver, and muscle damage.

## 6. Hawthorn

Hawthorn is a common shrub grown throughout the world. An extract made of its leaves and berries is sold as a prescription medicine for heart disease in Germany. Hawthorn contains the chemical quercetin which has been shown to reduce cholesterol. Hawthorn extract is sold primarily in capsules.



Conclusion:

Medical treatments often focus on alleviating symptoms. However measures which focus on decreasing underlying atherosclerosis—as opposed to simply treating symptoms—are more effective. Non-pharmaceutical means are usually the first method of treatment, such as stopping smoking and practicing regular exercise. If these methods do not work, medicines are usually the next step in treating cardiovascular diseases, and, with improvements, have increasingly become the most effective method over the long term.

The key to the more effective approaches has been better understanding of the widespread and insidious nature of the disease and to combine multiple different treatment strategies, not rely on just one or a few approaches. In addition, for those approaches, such as lipoprotein transport behaviors, which have been shown to produce the most success, adopting more aggressive combination treatment strategies taken on a daily basis and indefinitely has generally produced better results, both before and especially after people are symptomatic.

#### Bibliography:

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