

## Garlic's Biochemical Therapeutic Benefits on Soybean-Induced Atherosclerosis in Rats

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### Commentary

Three groups of animals were created (each group was eight rats). For 8 weeks, group one (control rats) was given a normal rat chow (C), group two was fed a Hypercholesterolemic diet (HPC) enriched with 25% soybean oil and 1% cholesterol, and group three was fed a Hypercholesterolemic diet (HPC) enhanced with 25% soybean oil and 1% cholesterol (HPC) Group three received a Hypercholesterolemic diet (HPC) enriched with 25% soybean oil and 1% cholesterol, and group four received a Hypercholesterolemic diet (HPC) enriched with 25% soybean oil and 1% cholesterol.

The ratio of triglycerides, Total Cholesterol Concentrations (TC), Low Density Lipoprotein Concentrations (LDL-C), High Density Lipoprotein Concentrations (HDL-C), and Total Cholesterol Concentrations (TC) were all studied. The serum concentrations of Total Cholesterol (TC), Low Density Lipoprotein (LDL-c), and triglycerides were all significantly higher in rats fed a hypercholesterolemic diet.

There was no discernible variation in HDL-C concentrations. Weight loss of body and organs, heart, kidney, liver, and belly fat was reported in rats fed a hypercholesterolemic diet. The rats on a hypercholesterolemic diet treated with garlic juice had significantly better lipidemic state and weight improvement of the body and organs. As a result of the findings, garlic juice is thought to be a major determinant of serum lipid concentrations and weight, and hence an antilipidaemic agent in the development of atherosclerosis.

Hypercholesterolemia (high serum concentrations of Low Density Lipoprotein (LDL-C) and blood serum cholesterol) is a lipoprotein metabolic condition characterised by high serum concentrations of LDL-C and blood serum cholesterol. Reduced risk factors such as proper nutrition, exercise, avoiding tobacco smoking, and limiting alcohol consumption can all help to prevent atherosclerosis. Because of the greater death rate from Ischemic Heart Disease (IHD), hypercholesterolemia is a big problem for many cultures and health professionals.

Elevated Total Cholesterol (TC) and Low-Density Lipoprotein (LDL) are well-known atherogenesis risk factors. The first lesion of atherosclerosis is a simple fatty streak, which develops into fibrous plaques and finally causes artery blockage, culminating in overt clinical symptoms. Several clinical studies of oral

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antilipidaemic medicines derived from plant extracts used in traditional medicine have been conducted, and many of the plants have been proven to have high activity. Garlic (*Allium sativum Linn*) has been utilised by humans for hundreds of years in various civilizations as meals, condiments, flavourings, and folk medicine.

The World Health Organization (WHO) has also urged that the plants' efficacy be evaluated in situations where safe and current medications are unavailable. As a result, there is a growing desire for research into natural antilipidemic plants that have few or no negative effects on cardiovascular disease. The garlic plant (*Allium sativum L.*) has been utilised as a pungent flavouring agent since antiquity. In the last decade, epidemiological studies and animal experiments have proved some of garlic's preventive properties. Elkayam, Mirelman, and Peleg investigated commercially available garlic preparations in the form of garlic oil, garlic powder, and pills, which are widely used for certain therapeutic purposes, such as lowering blood pressure and improving lipid profile, resulting in improved cardiovascular and other disease.

Garlic has been linked to a lower incidence of cardiovascular disease and cancer, as well as the activation of immunological function, liver protection, and an antioxidant effect. Garlic extract contains 33 sulphur compounds, many enzymes, 17 amino acids, and minerals like selenium, at the very least. Garlic also contains a wide range of biological properties, which are attributable to its high concentration of volatile Organosulfur Compounds (OSC) and other phytochemicals, which work together synergistically through a variety of ways to operate on multiple molecular targets.

Garlic or extracts contain hundreds of chemical components, which have been biochemically assessed. The glutamyl S-alk(en)yl-L-cysteines and S-alk(en)yl-L-cysteine sulphoxides, which include alliin substance, are some basic sulphur-containing bioactive elements in whole, undamaged garlic. The glutamyl peptides are intermediates in the biosynthesis of the cysteine sulphoxides molecule.

Alliin, (+)S -methyl-L-cysteine sulphoxide (methiin), and (+)S -(trans-1-propenyl)-L-cysteine sulphoxide (trans-1-propenyl)-L-cysteine sulphoxide (trans-1-propenyl)-L-cysteine sulphoxide (trans-1-propenyl)-L-cysteine S-(2-carboxypropyl) glutathione, glutamyl S -allyl-L-cysteine, -glutamyl S -(trans-1-propenyl)-L-cysteine, and -glutamyl S -allyl mercapto-L-cysteine have also been found in garlic cloves.

Garlic's primary health advantages are most likely due to a combination of components that work together. Furthermore, it is believed that the effectiveness and safety of garlic preparations,

as well as the processing methods used, are significantly responsible for the prediction of prospective health benefits from the garlic plant. Because of the complicated chemical structures of garlic extract, it's possible that different processing methods can result in very different formulations.

During the processing technique, very unstable thiosulphinates compounds, such as allicin, vanish and are quickly converted into a variety of organo-sulphur components. Despite the fact that there are numerous commercially available garlic supplements, they fit into one of four categories: 1- dehydrated garlic powder, 2- garlic oil, 3- garlic oil macerate, and 4- Aged Garlic Extract (AGE). Garlic has been recommended as a treatment for a variety of ailments, including cardiovascular and cerebrovascular disease, as well as other metabolic diseases, elevated lipid profiles (hyperlipidaemia), and diabetes mellitus. The goal of this study is to see how oral administration of garlic juice affects hypercholesterolemia and cholesterol in rats caused by a high dietary soybean oil intake.