SACsol™ Black Garlic

solchem®

SACsol™ Black Garlic: A Complete Antioxidant for Cardiovascular, Immune and Metabolism Health

Product Description

SACsol™

USES

- Provides antioxidant support better than raw garlic.
- Helps to maintain healthy cholesterol levels in a normal range.
- Helps to maintain blood pressure in a normal range.
- Supports to improve the immune functions by increasing NK cell activity and immune-stimulatory activities.

DESCRIPTION

Fermented food ingredients have been always a trend in dietary supplements and functional foods. Fermented food ingredients can provide numerous nutritional and health benefits. Many foods become healthier when fermented due to improvement in bioavailability of nutrients and phytochemicals, elimination of anti-nutrients, or the increased production of phytonutrients found in raw materials.

Black garlic is the result of aging garlic cloves under mild heat resulting in natural enzymatic fermentation. This fermentation turns the colour from white to black, besides other organoleptic changes like flavour and taste. In addition, the fermentation process increases the content in SAC, the most abundant antioxidant compound found in black garlic.

Under the name of **SACSol™ Black Garlic** Solchem launches a high powerful aged garlic extract rich in the main active of black garlic: S-Allyl-Cysteine (SAC).

PROPERTIES

During the aging process, unstable compounds of fresh garlic as alliin are converted into stable compounds including SAC, a water-soluble compound with antioxidant activity, as well as other compounds such as tetrahydro-betacarbolines, which are structurally similar to flavonoids.

Garlic is known for its cardiovascular benefits, its positive effect on immunity system and plasma lipid regulation. These effects on health are derived from sulphur-containing compounds such as allicin and S-allyl cysteine (SAC). Nevertheless, allicin produced from alliin is unstable under heat and is extremely pungent. The fermentation process that produces black garlic from regular garlic cloves increases the levels of the stable compound SAC and changes the flavour and odour of raw garlic to a sweet and umami aroma.

Besides the clear evidences about the efficacy and healthy properties of garlic, black garlic has been also studied for its antioxidant, immunoestimulant effects as well as for its metabolic action on hyperlipidemia and diabetes mellitus Type 2. All of these activities are related to the content in SAC of black garlic.

ANTIOXIDANT ACTIVITY

The protective activity of SAC has been well studied and has been shown to be associated with the prevention of

oxidative stress, including the prevention of lipid peroxidation by its scavenging action on free radicals as a direct antioxidant effect as well as numerous indirect antioxidant mechanisms.

Black garlic showed stronger antioxidant activity *in vitro* and *in vivo* than raw garlic due to the safe, stable, bioavailable and beneficial compounds during the natural aging process.

Direct Free Radical Scavenging Activity

The free radicals of most concern in biological systems are derived from oxygen and are known as reactive oxygen species (ROS). SAC in black garlic contains a thiol group responsible for its antioxidant capacity because can easily neutralize reactive oxygen species such as superoxide anions, hydrogen peroxide and others.

Indirect Activity by the Activation of Antioxidant Enzymes

In vitro and animal models have shown that SAC increases the activity of endogenous antioxidant enzymes such as glutathione peroxidase and superoxide dismutase (SOD).

In addition, SAC has also been shown to activate a nuclear factor, which under oxidative stress, enhance the expression of antioxidant enzymes that restore the redox homeostasis.

CARDIOVASCULAR HEALTH

There are publications about scientific evidence that black garlic may also protect cardiovascular system by maintaining healthy cholesterol levels and blood pressure, as well as reducing platelet aggregation and vascular calcification as garlic does.

Clinical evidences have demonstrated that subjects receiving 2.4 g of black garlic daily for 7 days reported more resistance to LDL-cholesterol oxidation than those who were not into black garlic treatment.
In a double-blind, parallel randomized placebo-controlled trial involving 50 patients, the supplementation of 960 mg black garlic (providing 2.4 mg SAC) daily for 12 weeks resulted in reduced systolic blood pressure compared with controls.

Other clinical and randomized studies have shown similar results on blood pressure and endothelial cells function with doses of 1.2 to 2.4 mg of SAC.

IMMUNOSTIMULANT PROPERTIES

In vivo tumoral models have shown an enhancement of immune system by black garlic extracts. In this sense, the activity of natural killer cells (NK), the secretion of interferon gamma (IFN-γ), the production of NO by macrophages and the generation of anti-inflammatory mediators produced by lymphocytes T helper (Th1) reached a maximum after 8-10 days of treatment with black garlic.

In addition to this, the production of interleukin-4 (IL-4), which is associated to allergic reactions because it promotes the activity of lymphocytes B to produce IgE, was reduced by black garlic treatment.

Some authors have pointed out that the enhancement of the immune system by black garlic might be due to the water-soluble SAC presence.

OBESITY AND HIPERLIPIDEMIA

Several studies have investigated hypoglycemic and hypocholesterolemic effects of black garlic in animal model of type 2 diabetes mellitus.

An *in vivo* study measured the inhibitive effect of black garlic extract on mature adipocyte differentiation of pre-adipocyte. The results showed that black garlic extract inhibited pre-adipocyte differentiation and fat accumulation compared with the untreated cells. In addition, the treatment showed a decrease in final body weight, serum triglycerides, hepatic total cholesterol and

triglycerides compared with the control group. Once again the effect was attributed to the presence of SAC in the black garlic extract.

DIABETES MELLITUS TYPE 2

Hyperglycemia in the diabetic state increases oxidative stress and antioxidant therapy can be strongly correlated with decreased risks for diabetic complications. In this sense, animal models of type 2 diabetes have shown that black garlic exerts stronger antioxidant activity than garlic *in vitro* and *in vivo*, suggesting garlic and aged black garlic, to a greater extent, could be useful in preventing diabetic complications.

Prolonged hyperglycemia of diabetes induces overproduction of ROS and free radicals, which can in turn trigger process of diabetic complications. To protect molecules from ROS and free radicals, cells have developed antioxidant defense system including SOD, CAT and GSH.

The studies have demonstrated that SAC of black garlic increases SOD and GSH activities in Diabetes mellitus Type 2 animal models.

CONCLUSION

Based on the large body of scientific evidence, **SACSol™ Black Garlic** can be used to support cardiovascular and immune health, as well as managing some metabolic situations such as obesity, hyperlipidaemia and diabetes Type 2.

SACSol™ Black Garlic is standardized to SAC content, allowing to supply 1.2 to 2.4 mg SAC just with 120 to 240 mg daily, to match clinical trials.

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