



**Name :**Black Bean Extract

Anthocyanidins

**Source:** Black Bean

**Botanical Name :**Glycinemax(L.)merr

**Extract part:** Beans/Seed

**Composition :**Anthocyanidins

**Purity:**25%

**Identification measure :**HPLC

### Source

Soybean or soya bean are the common English names of a east-Asian native species of legume , Glycine max, which were widely cultivated for the highly valued edible seeds with numerous uses. The highly nutritious sprouts are readily consumed in Asia. In Chinese herbals medicine system the soybean was suggested as a specific remedy for the proper functioning of the bowels, heart, kidney, liver, and stomach.As a kind of edible and pharmaceutical product, Black soybean not only has abundance of nutrition,but also has many functional characteristic.Among a variety of soybeans, black soybean is known to display diverse biological activities superior to those of yellow and green soybeans, such as in antioxidant, antiinflammatory and anticancer activities.

### Main Bio-actives

Black soybeans contain significant amounts of total phenolic content (TPC), total flavonoid content (TFC), condensed tannin content (CTC), monomeric anthocyanin content (MAC), gallic acid and 2,3,4-trihydroxybenzoic acid , phenolic acids ,phytic acid, and alpha-linolenic acid.

The hull of black soybeans are rich in anthocyanidins ,a natural antioxidant that that are responsible for the pigmentation of various fruits and vegetables. Anthocyanidins exerts multiple phytochemical properties associated with antioxidant activities .

### Functions

Improvement of Visual Sensation

Recent studies investigated effective of anthocyanins from black soybeans hull against retinal degeneration on an animal model .The report on [Experimental Eye Research](#) presented during the 4 weeks daily administration , anthocyanins therapy increased Electroretinographic responses were significantly increased in N-methyl-N-nitrosourea induced retinal damaged rats. Morphologically, the outer nuclear layer, where photoreceptors reside, was well preserved in the anthocyanin-treated rat retinas

throughout the experimental period. In addition, retinal injury, evaluated by immunolabeling with an antibody against glial fibrillary acidic protein, was markedly reduced in anthocyanin-treated retinas. These results demonstrate that anthocyanins extracted from black soybean seeds can protect retinal neurons from MNU-induced structural and functional damages, suggesting that anthocyanins from black soybean seed coat may be used as a useful supplement to modulate RD.

#### Hepatoprotective

Studies have been conducted to investigate the fatty liver improvement of black soybean. According to Journal of Food Science, the mice fed with black soybeans had significantly lower triglyceride concentrations than the senescence-accelerated mice (SAMP8) control group. The nanonized black soybean group had a lower degree of spontaneous fatty liver, alanine aminotransferase, and thiobarbituric acid-reactive substance concentrations, and had enhanced superoxide dismutase, catalase, and glutathione peroxidase activities of livers when compared with the SAMP8 control and micronized black soybean groups. Further researches on mice fed high cholesterol/fat diets suggested the black soybean improves oxidative and antioxidative stress balance, cholesterol metabolism, insulin resistance, and alleviates oxidative damage in high cholesterol and high fat diet-induced non-alcoholic fatty liver.

#### Anti-oxidant

Black soybean is known for health promoting by obtaining natural antioxidant including anthocyanins. In the study reported on Int J Vitam Nutr Res in 2010, black soybean reduce lipid and oxidative stress levels in an overarictmized rat model. Result indicated black soybean possess potent activities in reducing plasma triglyceride levels and controlling low-density lipoprotein cholesterol (LDL-C) levels. Superoxide dismutase (SOD) and catalase (CAT) activities were significantly higher in the groups fed beans compared to the casein group. In conclusion, the report suggest that consumption of various types of beans may inhibit oxidative stress in postmenopausal women by increasing antioxidant activity and improving lipid profiles. Notably, intake of black soybean resulted in the greatest improvement in risk factors associated with cardiovascular disease.

Antioxidative of black soybean also found to be improving skin aging involves degradation of extracellular matrix. According to Phytomedicine, antioxidant in black soybean ameliorate skin aging through scavenges free radicals from skin cells, prevent trans-epidermal water loss, include a sun protection factor (SPF) of 15 or higher.

#### Cardiovascular health

Many clinical trials have demonstrated the beneficial effects of soybean (Glycine max) on general cardiovascular health. Scientific study reported on The Journal of Nutritional Biochemistry in 2011 investigated the effect of black soybean extract against thrombotic diseases in vitro and in vivo. Study showed BB obtain potent inhibitory activity on collagen-induced platelet aggregation. BB also attenuated serotonin secretion and P-selectin expression, which are important factors for the platelet-tissue interaction along with thromboxane A<sub>2</sub> formation. These in vitro results were further confirmed in vivo venous thrombosis model where oral administration of BB reduced collagen-induced platelet aggregation and FeCl<sub>3</sub>-induced thrombus formation significantly. A potential

active ingredient for antiplatelet effects of BB was isolated and identified to be adenosine through bioassay-directed fractionation and NMR and ESI-MS analyses. These results indicate that black soybean can be a novel dietary supplement for the prevention of cardiovascular risks and the improvement of blood circulation.

### **Anti-obesity**

Investigation of anthocyanins extract effect on body weight, adipose tissue weight, and serum lipids was evaluated in rats fed a high fat diet (HFD). Study result released on J Med Food in 2007 described black soybean extract anthocyanins significantly lowered weight gain in the rats fed HFD. The black soybean anthocyanins-added diet suppressed the HFD-induced weight gain in liver intermediately and tended to decrease the weights of epididymal and perirenal fat pads. The black soybean anthocyanins were also effective in improving the lipid profile. They significantly reduced the levels of serum triglyceride and cholesterol, while they markedly increased the high-density lipoprotein-cholesterol concentration, which was decreased in the rats fed HFD. These results indicate that the anthocyanins in black soybean seed coats have an anti-obesity effect, which can reverse the effects of HFD on body weight, adipose tissue weight, and serum lipid contents.

### **Wound healing**

Food and Chemical Toxicology reported in 2009 that anthocyanins from black soybean hull stimulate wound healing. The study presented that the treatment of anthocyanins for 48 h significantly stimulated the migration of both human dermal fibroblasts and keratinocytes at 50 and 100  $\mu\text{g}/\text{mL}$  concentrations. Treatment of cells with anthocyanins stimulated wound-induced VEGF production in fibroblasts and keratinocytes. Furthermore, treatment of anthocyanins reduced, in a dose-dependent manner, the adhesion of inflammatory monocytes to endothelial cells. Anthocyanins also blocked both the translocation of nuclear factor-kappa B (NF- $\kappa\text{B}$ ) p65 into the nucleus and the phosphorylation of the inhibitory factor  $\kappa\text{B}\alpha$  (I $\kappa\text{B}\alpha$ ). Thus, treatment with anthocyanins from black soybean seed coats may be a potential therapeutic strategy to promote wound healing and to prevent inflammation in a persistent inflammatory condition.

### **Applications**

Applied in food field, black bean extract is added as functional food additive;•  
Applied in cosmetics field, black bean extract is widely added into the cosmetics ;  
Applied in pharmaceutical field, black bean extract is mainly used as raw materials;  
Applied in health product field, black bean extract is widely added into various kinds of health products.