Doctor's BEST® Science-Based Nutrition™

Decursinol PN and Decursinol GS

Decursinol PN
60 Vegetarian Capsules

Ingredients per 1 vegetable capsule:
Decursinol-50™ .....250 mg
(extract from roots of Korean Angelica (*Angelica gigas* Nakai))

Excipients: Modified cellulose (vegetarian capsule)

Contains nothing other than listed ingredients.

Suggested Adult Use: Take one capsule twice daily, with or without food.

Suitable for Vegetarians.

Decursinol GS
120 Capsules

Ingredients per 2 capsules:
Potassium (from glucosamine sulfate 2KCl) 92mg
Chloride (from glucosamine sulfate 2KCl) 84mg
Decursinol-50™ 250mg
(extract from roots of Korean Angelica (*Angelica gigas* Nakai))
Glucosamine sulfate 2KCl 750mg

Excipients: Gelatin capsule, cellulose, magnesium stearate (vegatable source)

Contains nothing other than listed ingredients.

Suggested Adult Use: Take two (2) capsules twice daily, with or without food.

Ingredients

The primary ingredient of Decursinol PN, ***Decursinol-50™,*** is a whole root extract from the plant *Angelica gigas* Nakai, commonly known as Korean Angelica. This plant has a history of traditional use dating back over a thousand years. The product is prepared via a proprietary extraction process in which dried whole roots undergo an alcohol-based extraction yielding a high concentration of the major active compounds of the root: decursinol and decursin. Studies suggest that ***Decursinol-50™*** may be useful for the treatment and relief of minor pain.*

Benefits

Minor Pain Relief with Decursinol PN*

Animal and *in vitro* experiments suggest the ability of ***Decursinol-50™*** extract, and the major components decursinol and decursin, to alleviate minor pain. Decursinol, one of the compounds purified from the dried roots of *Angelica gigas* Nakai, has been studied in animals for its pain relieving effects. It appears to possess analgesic effects in animal studies by impacting opioid receptors in the central nervous system, but may also affect adrenergic and serotonergic receptors. The central nervous system effect seems to be the major mechanism of action of the product. Decursin, a related but distinct compound from *Angelica gigas* Nakai, has shown modulatory activities on a number of degradation enzymes and cytokines of the immune system *in vitro*.

Maintain Healthy Joints and Get Minor Pain Relief with Decurinol GS*

Decursinol-GS is a combination of Decursinol-50™ and glucosamine sulfate designed to support joint function and promote optimal joint comfort.* Glucosamine is a key structural component of cartilage and plays an important role in promoting healthy joint cartilage.* Glucosamine sulfate has been the subject of numerous clinical trials showing significant benefits to joint health.* The glucosamine sulfate used in this product is sodium-free.

Glucosamine sulfate is the most well studied form of glucosamine. A number of trials have shown glucosamine sulfate's ability to support healthy joint function. In order to better understand glucosamine's role in joint health, it is important to understand joint structure and function. Cartilage in the joints acts as a shock absorber to cushion the blows of daily wear and tear. Joint cartilage is made of a unique connective tissue that consists of collagen and proteoglycans. Collagen is a strong, fibrous, insoluble protein. Proteoglycans are large, carbohydrate-rich protein chains made up of 95 percent polysaccharides and 5 percent protein called glycosaminoglycans (GAGs). GAGs are composed of repeating two-sugar units (disaccharides) that contain glucosamine sulfate and other amino sugars. Surrounding the joint cartilage is synovial fluid, which contains many substances including its chief component, hyaluronic acid. Hyaluronic acid forms the backbone of other proteoglycans and is responsible for the thickness of synovial fluid as well as its lubricating and shock-absorbing properties. Synovial fluid also provides nutrients for the joint cartilage.

Glucosamine sulfate is a normal constituent of glycosaminoglycans in cartilage and synovial fluid. In essence, glucosamine sulfate provides important building blocks for cartilage production. Laboratory studies suggest that glucosamine may also function to stimulate production of cartilage-building proteins. It is also thought that the sulfate portion of the molecule contributes to the efficacy of glucosamine sulfate in the synovial fluid by providing the elemental sulfur needed for strengthening cartilage and aiding glycosaminoglycan synthesis. [5,6,7]

Glucosamine sulfate has been the subject of research for over twenty years. Clinical trials as well as experimental studies have repeatedly supported the efficacy of oral glucosamine sulfate in supporting joint function. In one large open trial, over 1200 people took oral glucosamine sulfate for periods ranging from 36 to 64 days. In this multi-center trial, ninety-five percent of the subjects experienced greater joint comfort and increased mobility. The physicians reported "good" results in 59%, and "sufficient" results in 36%. Furthermore, the improvements in joint health lasted for up to three months after the glucosamine sulfate was discontinued.[7]

A recent multi-center randomized, placebo-controlled study that was six months in duration, known commonly as the GUIDE study, was performed in 318 subjects. The study consisted of two treatment groups and a placebo group.

Continued on reverse side

One of the treatment groups received glucosamine sulfate in a daily dose of 1500 milligrams. The results of this important study confirmed that the efficacy of glucosamine sulfate for supporting joint function was significantly superior to placebo on all parameters measured.[8]

Taken together, the scientific data suggests that Decursinol-GS is a unique combination of two important ingredients with the potential to support optimal joint function and enhance feelings of joint comfort and ease.*

Animal Data

In a series of animal experiments, mice were subjected to testing on various models of pain to determine the effects of decursinol at alleviating the pain response. The methanolic extract from dried roots of *Angelica gigas* Nakai was shown to significantly enhance the latency of the pain response to both the tail-flick and hot-plate experiments in these animals, indicating higher tolerance to pain in these animals. Researchers suggest that the tail-flick response pain model may be a good indicator of response to pain in humans. As is often the case with animal research, the doses used were quite large. The results showed that the pain relief effect was dose-dependent and started at an oral dose of 100 mg/kg of body weight. A significant sedative relaxing effect was shown at an oral dose of 200mg/kg of body weight.[1]

In a separate animal pain model (also a part of the same set of experiments described above), decursinol was found to attenuate the number of writhings induced by intraperitoneal injections of acetic acid. Injection of acetic acid causes inflammation and the writhing response is considered an inflammatory pain model. A decrease in the number of writhings is another crude indicator of higher levels of pain tolerance in mice.

Studies using further pain models were also performed. In one such study, formalin was injected into the hindpaw of several mice. Two distinct periods of licking/flinching and biting the paw are observed in the formalin test. The decursinol-treated mice exhibited diminished pain sensations in both phases, especially in the second phase. In addition, production of the inflammatory cytokines TNF-alpha, IL-1beta and IFN-gamma was shown to be inhibited by decursinol. These series of animal experiments highlight a number of potentially distinct mechanisms whereby decursinol may decrease the normal response to pain.[2]

In vitro Studies

Decursin, a separate compound from the roots of *Angelica gigas* Nakai, has been shown to have anti-inflammatory effects *in vitro*. A trial was performed in which both mouse and human macrophages were activated with LPS (a bacterial lipopolysaccharide that is a known inducer of inflammation) in the absence and presence of decursin. Macrophages play important roles in the regulation of inflammation in the body. These cells, when activated, stimulate the activity of other immune system molecules such as degradation enzymes (i.e. MMPs, or matrix metalloproteinases, enzymes that degrade extracellular matrix proteins) and cytokines. Decursin was found to suppress the induction of MMP-9 by macrophages *in vitro* in a dose-dependent manner. It was also able to inhibit LPS-induced nitric oxide production, another response associated with inflammation, *in vitro*. In further investigations, decursin was also found to suppress the production of a number of different inflammatory markers, such as MCP-1 (which plays a role in the recruitment of immune cells to the inflammatory site), IL-8, TNF-alpha, and IL-1 beta. Decursin was found to suppress all of these markers at the transcriptional level in vitro by blocking the genes involved in the associated immune responses.[3]

Clinical Trial Data

A recent clinical trial was conducted at the *Mapo Pain Clinic* in South Korea to evaluate the effectiveness and safety of GWB78 extract, also known as ***Decursinol-50™***, in a group of individuals with chronic pain not responsive to other treatments. Each participant (40 participants total) was administered 500 milligrams of GWB78 powder twice daily for two weeks in conjunction with a physical therapy regimen. The control group consisting of 40 additional participants was treated only with physical therapy for the same time period.

Blood samples were taken and the degree of pain was measured using a visual analog scale (VAS). VAS pain scores were significantly reduced by an average of 68% in the participants treated with ***Decursinol-50™*** whereas pain scores in the control group (physical therapy alone) only improved by an average of 15%. The treatment was well tolerated with no adverse effects noted, indicating the safety of the extract, and no significant changes in blood measures were seen.[4] Further clinical trials with larger numbers of participants are currently underway.

*This statement has not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

Scientific References

1. Choi SS, Han KJ, Lee HK, Han EJ, Suh HW. Antinociceptive profiles of crude extract from roots of Angelica gigas NAKAI in various pain models. Biol Pharm Bull. 2003 Sep;26(9):1283-8.

2. Choi SS, Han KJ, Lee JK, Lee HK, Han EJ, Kim DH, Suh HW. Antinociceptive mechanisms of orally administered decursinol in the mouse. Life Sci. 2003 Jun 13;73(4):471-85.

3. Kim JH, Jeong JH, Jeon ST, Kim H, Ock J, Suk K, Kim SI, Song KS, Lee WH. Decursin inhibits induction of inflammatory mediators by blocking nuclear factor-kappaB activation in macrophages. Mol Pharmacol. 2006 Jun;69(6):1783-90.

4. Chun YS. Clinical study of GWB78 as a pain-killer with chronic degenerative joint arthritis and cervicoomobrachial syndrome patients. Mapo Pain Clinic, Seoul. November 2001. Scigenic Co., Ltd. Unpublished study report obtained from manufacturer.

5. Vidal y Plana RR, Bizzarri D, Rovati AL. Articular cartilage pharmacology: I. In vitro studies on glucosamine and non-steroidal antiinflammatory drugs. Pharmacological Research Communications 1978; 10(6):557-569.

6. Tapadinhas MJ, Rivera IC, Bignamini AA. Oral glucosamine sulphate in the management of arthrosis: report on a multi-centre open investigation in Portugal. Pharmatherpeutica 1982; 3(3):157-68.

7. Vaz AL. Double-blind clinical evaluation of the relative efficacy of ibuprofen and glucosamine sulphate in the management of osteoarthrosis of the knee in out-patients. Current Medical Research and Opinion 1982; 8(3):145-149.

8. Herrero-Beaumont G, Román JA, Trabado MC, Blanco FJ, Benito P, Martin-Mola E, Paulino J, Marenco JL, Porto A, Laffon A, Araùjo D, Figueroa M, Branco J. Effects of Glucosamine Sulfate on 6-Month Control of Knee Osteoarthritis Symptoms vs Placebo and Acetaminophen: Results from the Glucosamine Unum in Die Efficacy (GUIDE) Trial. 2005. Abstract URL: https://www.rheumatology.org/press/2005/herrero-beaumont.asp

Doctor's Best • 1120 Calle Cordillera • Suite 101, San Clemente, CA 92673
phone: 800-333-6977 • fax: 949-498-3952 • website: www.drbvitamins.com

Decursinol-50™ is a whole root extract from the plant *Angelica gigas* Nakai, commonly known as Korean Angelica. This plant has a history of traditional use dating back over a thousand years. The product is prepared via a proprietary extraction process in which dried whole roots undergo an alcohol-based extraction yielding a high concentration of the major active compounds of the root, decursinol and decursin. Studies suggest that Decursinol-50™ may be useful for the treatment and relief of minor pain.*

Relief from Minor Pain*

***These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.**

Distributed by: **Doctor's Best, Inc.**
1120 Calle Cordillera, Suite 101, San Clemente, CA 92673
(800) 777-2474 www.drbvitamins.com

Doctor's BEST®

Science-Based Nutrition™

Dietary Supplement

Decursinol PN™

MINOR PAIN RELIEF*

250 mg/60 Veggie Caps

Supplement Facts

Serving Size 1 capsule
Servings per container 60 servings

	Amount per serving	% Daily Value
Decursinol-50™ (extract from roots of Korean Angelica (Angelica gigas Nakai))	250 mg	†

† Daily Value not established.

Other ingredients: Modified cellulose (vegetarian capsule).

Contains shellfish (shrimp, crab)

Suggested Adult Use: Take one capsule twice daily, with or without food.

Suitable for vegetarians

CONTAINS NOTHING OTHER THAN LISTED INGREDIENTS.

7 53950 00175 6