

Liver Support System Ingredient Rationale

Bioflavonoids are a class of water-soluble plant pigments (colors) that have anti-inflammatory, antihistaminic and anti-viral properties. Health professionals formulated the liver support system specifically for detoxifying the liver and gall bladder and supporting the functions of each.

Included Bioflavonoids

1. Silymarin

Numerous clinical studies have shown silymarin to be among the most powerful natural agents available for the prevention and treatment of liver damage caused by exposure to human-made chemicals, including alcohol-induced liver degeneration.

References:

Wagner, H., "Antihepatotoxic flavonoids" in Cody, V., Middleton, E., and Harbourne, J.B., (eds.) *Plant Flavonoids in Biology and Medicine: Biochemical, Pharmacological, and Structure-Activity Relationships*, Alan R. Liss. New York, NY, 1986: pp. 545-58.

Salmi, H.A. and Sarna, S. "Effect of Silymarin on chemical, functional, and morphological alterations of the liver. A double-blind controlled study." *Scand J Gastroenterol.*, 1982, 17: pp.417-21.

Boari, C., Montanari, M., Galletti, G.P., et al. "Occupational toxic liver diseases. Therapeutic effects of silymarin." *Life Sci*, 1981, 29: pp. 2,751-5.

2. Quercetin

Quercetin is a bioflavonoid with antioxidant effects. Quercetin is used extensively in the treatment of athletic injuries because it relieves pain and bruising and acts synergistically with Vitamin C to protect and preserve the structure of capillaries. It also promotes circulation, lowers cholesterol levels and treats and prevents cataracts.

References:

Lininger, SW, et al. *The Natural Pharmacy*. 1st ed. Rocklin, CA: Prima Publishing; 1998.

Lean ME, Noroozi M, Kelly I. "Dietary flavonols protect diabetic human lymphocytes against oxidative damage to DNA." *Diabetes*, (Jan. 1999), 48(1): 176-81.

Lean ME, Noroozi M, Kelly I. "Dietary flavonols protect diabetic human lymphocytes against oxidative damage to DNA." *Diabetes*, (Jan. 1999), 48(1): 176-81.

Encyclopedia of Nutritional Supplements. Prima Publishing, Michael T. Murray, ND, 1996: pp. 324-5.

Satvric, B. "Quercetin in our diet: from potent mutagen to probable anticarcinogen." *Clin Biochem* 27, 1994: pp.245-8.

Ferrandiz, M.L. and Alcaraz, M.J. "Anti-inflammatory activity and inhibition of arachidonic acid metabolism by flavonoids." *Agents Action* 32, 1991: pp.238-287.

3. Catechin

Catechin, another naturally-occurring flavonoid, is similar in effect to silymarin. Catechin is a powerful antioxidant that helps prevent free radical oxidative damage to cells. It also helps in the treatment and prevention of alcohol and chemical-induced liver disease or damage. Catechin is valuable for its ability to neutralize intestinal toxins and assist in the stabilization of cell membranes.

Reference:

Golan, R. *Optimal Wellness*. Ballantine Publishing, 1995. P. 179.

4. Hesperidin

Hesperidin has been shown to be useful in clinical trials as an analgesic and anti-inflammatory. This is useful since the liver and the whole body can become inflamed due to toxicity or the detoxification process.

Reference:

E.M. Galati, et al. "Biological effects of hesperidin, a citrus flavonoid. (Note 1): Anti-inflammatory and analgesic activity." *Farmacologia* 40 (11), Nov. 1994: pp. 709-12.

Null, G. "Clinician's Handbook of Natural Healing." Kensington Publications, 1997: pp. 170-71.

5. Rutin

Rutin is an antioxidant bioflavonoid, free radical scavenger and an iron-chelator. It is used as a vascular protector for reducing capillary fragility, permeability and bleeding, and as a treatment for varicose vein symptoms. Some studies show that rutin offers protection from damage induced by asbestos, the cytotoxic effects of oxidized low-density lipoproteins (LDL), and gastric injury from ethanol. It also offers some protection against DNA damage. Rutin is used extensively in the treatment of athletic injuries because it relieves pain and bruises and acts synergistically with Vitamin C to protect and preserve the structure of capillaries. It also promotes circulation, promotes healthy cholesterol levels and supports normal ocular function.

Reference:

Kostyuk, V. and Potapovich, A. "Antiradical and chelating effects in flavonoid protection against silica-induced cell injury." *Arch Biochem Biophys*, 355(1), 1998: 43-48.

Schmitt, A., Salvayre, R., Delchambre, J., and Negre-Salvayre, A. "Prevention by alpha-tocopherol and rutin of glutathione and ATP depletion induced by oxidized LDL in cultured endothelial cells." *Br J Pharmacol*, 116(3), 1995: 1985-1990.

C Balch, James F., and Balch, Phyllis A. *Prescription for Nutritional Healing*. Avery Publishing Group, Garden City Park, NY. 1997: 20.

6. Cynarin

Cynarin assists in the detoxification of the liver and gall bladder. It also supports the function of these two important organs and assists in their regeneration following damage from over toxicity. Cynarin stimulates the clearance of bile from the liver, preventing congestion in the liver and thus diminishing the chances of liver damage. Reference:

A. Encyclopedia of Nutritional Supplements. Prima Publishing, Michael T. Murray, ND, 1996: p. 353.

7. Sarsaparilla

Sarsaparilla has been used to promote healthy skin, joints and cell division. It contains saponins, which are steroid-like agents that bind with toxins in the digestive tract. Historically, sarsaparilla has been used as a 'blood purifier' and a general tonic for diseases associated with increased endotoxin levels.

The tonic effect of sarsaparilla is the result of its ability to stimulate the removal of accumulated waste products from the cells, blood and lymph. These actions tend to increase the health of the entire body and increase vitality, thereby increasing energy and endurance.

Reference:

The Natural Pharmacy. Prima Publishing, Liniger, Wright, Austin, Brown & Gaby, 1998: pp. 305-6.

Herbal Tonic Therapies. Keats Publishing, Mowrey, D., 1993: p. 354.

8. Chlorogenic Acid (16%)

Chlorogenic Acid is a naturally-occurring, water soluble phenolic acid that is a potent antioxidant, promotes healthy cells and protects against lipid peroxidation and free radical mediated cell injury.

Reference:

J Chromatogram A 1996; 741(2): pp.223-31

Biosci Biotechnol Biochem 1996; 60 (5): pp. 765-68.

Biochem Pharmacol 1987; 36 (5): pp.717-20.

Plant Foods Hum Nutr 1994; 45 (3): pp.287-98.