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Policosanol

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The Cholesterol Fighting Properties of Policosanol

Cardiovascular disease (CVD) is a general term for all disorders of the heart and blood vessels, and is the number-one medical problem facing the U.S. today. Commonly referred to as heart disease, CVD is ubiquitous and the costs are tremendous.

It is estimated that 2,700 Americans die each day from CVD, and over 58 million Americans have CVD. More than 50 percent of the adult deaths in America are caused by heart attacks and strokes, and the American Heart Association has estimated that CVD health expenditures and lost productivity cost Americans \$298 billion per year.

One of the main pathogenic conditions behind CVD is elevated cholesterol (200 - 239 mg/dL) or high cholesterol (above 240 mg/dL). High levels of oxidized cholesterol directly cause and accelerate cardiovascular disease by promoting narrowing and hardening of blood vessels. For this reason, health practitioners have long sought a safe, natural method for reducing cholesterol. One alternative may be policosanol.

POLICOSANOLS IN NATURE

Policosanols are a family of primary long-chain aliphatic (non-ring) alcohols found in the form of waxes that are prevalent throughout nature. Sources used in the dietary supplement industry include: sugar cane, rice bran, beeswax, broccoli, spinach, alfalfa, and oats. Plants make aliphatic alcohols from short-chain acetate units within epidermal cells and are thought to be important for plant growth¹ and act as a water barrier.

The origins of research into the cholesterol-lowering effects of policosanol dates to 1972 when the Japanese researcher Dr. Hiroko Sho demonstrated that rats fed raw sugar showed significantly lower cholesterol and triglycerides levels, while refined sugar administration resulted in elevated triglycerides and cholesterol.²³

Subsequently, She identified the dominant components in the sugar cane rind: wax and fatty alcohols⁴ and showed that these substances reduced cholesterol in the serum and liver of rats.⁵ Since then, many scientists worldwide have focused on the diverse beneficial properties of policosanol.

In several double-blind, randomized, placebo-controlled clinical trials, as well as animal studies, sugar cane policosanol has been clinically shown to reduce total cholesterol, strongly reduce potentially harmful LDL cholesterol and raise beneficial HDL cholesterol.

In a 20-month study involving hyperlipidemic subjects, those taking 10 mg policosanol per day (5 mg twice a day) reduced their total cholesterol 10 percent, LDL cholesterol 11 percent, and triglycerides 18 Percent.⁶ One group of this study consumed a mixture of 10 mg policosanol with 125 mg aspirin daily, and the scientists noted that aspirin potentiates the cardioprotective effects of policosanol.

A pilot study done on subjects with both non-insulin dependent diabetes mellitus (NIDDM) and hypercholesterolemia consuming 10 mg sugar cane policosanol per day provided even better results (except for triglycerides): reduction of total cholesterol 28.9 percent, LDL cholesterol 44 percent, and HDL increases of 23.5 percent.⁷

A recent study done on similar subjects (hypocholesteremics with dyslipidemia caused by NIDDM), however, showed significantly different results with a 20 mg daily dose: reduction of total cholesterol 15.6 percent, LDL cholesterol 27.4 percent, and HDL increases of 17.6 percent. The same study revealed that stronger dosing above 20 mg does not offer any greater

benefits, as they observed virtually the same results with 40 mg quantities.⁸

VASCULAR PROTECTION

Another way policosanol fights atherosclerosis is by reducing endothelial injury to the circulatory system. This process is initiated by the oxidation of LDL cholesterol, followed by macrophage recruitment to engulf oxidized LDLs. When the macrophages are filled with oxidized LDL, they are called foam cells; these foam cells penetrate the arterial wall and commence the process of arterial occlusion.⁹

A study involving 64 subjects showed that 5 and 10 mgs per day of sugar cane policosanol provided strong protection against the oxidation of LDL cholesterol.¹⁰ Oxidation of LDL cholesterol is thought to be a determinative component in cardiovascular disease.

Furthermore, sugar cane policosanol protects the arterial wall by reducing the amount of macrophages recruited, resulting in a significant reduction in atherosclerotic lesions¹¹ and circulating endothelial cells (a marker of endothelial injury).¹² The National Institute of Health guidelines state that LDL cholesterol should be below 130 mg/dl for the general population and 100 mg/dl for heart disease patients.

Policosanols are now undergoing research for their effects on brain and nerve metabolism. Though this research is in its infancy, a rodent study demonstrated that hexacosanol (a 26-carbon policosanol) enhanced nerve generation following sciatic nerve crush¹³ These types of studies are enabling scientists to uncover the biological role of aliphatic alcohols, which had been unknown.

With regard to the ongoing investigations into policosanol's effects on cholesterol, the preliminary results are very

inviting. The specific aliphatic alcohol responsible for cholesterol reduction has not yet been identified. Though octacosanol has been shown to individually reduce cholesterol and triglycerides,¹⁴ there is no doubt that the blend of the aliphatic spectrum, as is found in sugar, rice, and beeswax, is superior to an isolated aliphatic alcohol. The following three members of the policosanol family have been studied in isolation and shown to possess unique properties. (For the purposes of this article, the policosanol from sugar cane wax [80-90 percent] is compared to that of beeswax [90 percent] and to rice bran wax [90 percent]):

OCTACOSANOL

The most famous member of the policosanol family is octacosanol, a 28-carbon aliphatic alcohol (molecular weight 410.74), popularized as an active ingredient in wheat germ oil. Its proportion to other aliphatic alcohols in the policosanol profile depends on the source. Sugar cane wax can contain approximately 60-70 percent octacosanol, while rice bran wax and beeswax levels are approximately 17.5 percent

A small double-blind, placebo controlled randomized crossover trial involving 10 patients with mild to moderate Parkinson's disease showed that three patients improved significantly within six weeks of consuming 15 mg octacosanol per day.¹⁵ Many beneficial attributes of octacosanol have been reported, in both humans and animal investigations: reduction of cholesterol and triglycerides (rodents),¹⁶ improvement of motor endurance (rodents), increased size of testes and seminal vesicles (rodents), and increased stamina and physical exertion (humans).¹⁷

DOCOSANOL

The other members of the policosanol family have equally interesting biological effects. Docosanol is a 22-carbon aliphatic alcohol (molecular weight 326.57) that is an ingredient comprising of a patented 10 percent topical anti-herpes medication available from your doctor. Some pharmaceutical companies have been conducting research and patenting the powerful, broad-spectrum anti-viral effects of docosanol.

Researchers have recently identified docosanol to topically reduce the severity of burns in animal experiments.¹⁸ Also, the herb *Pygeum africanum* contains significant quantities of docosanol, and this may be the primary active component responsible for im-

proving prostate function. While the sugarane wax and beeswax appears to contain little or no docosanol, rice bran wax contains approximately 6 percent.

TRIACONTANOL

The primary policosanol in rice bran wax is triacontanol, a 30-carbon aliphatic alcohol (molecular weight: 438.80). Triacontanol has been demonstrated in numerous studies to increase the growth of various plants, including tomato, cotton seed, orchids, tulip bulbs, sweet corn, and white kidney bean extract (*Phaseolus vulgaris*, used in today's popular alpha-amylase inhibitors).¹⁸

Recent in vitro research has shown triacontanol to be a powerful inhibitor of lipid peroxidation, and it may exert anti-inflammatory effects.²⁰ In fact, the anti-inflammatory effect may be mediated by its capability to reduce lipid peroxidation. The sugar cane wax contains between 10-15 percent triacontanol, while the rice bran wax and beeswax contains approximately 26 percent each.

POLICOSANOL•THE FUTURE

The NIH (National Institute of Health) has conducted a seven-year clinical trial and concluded that reducing serum cholesterol reduces the risk of heart disease, and this can be accomplished by taking policosanol. Also, policosanol protects against heart disease by reducing foam cell induction, inhibiting LDL oxidation and reducing platelet aggregation.

In summary, the diverse world of beneficial effects from policosanol offers an exciting and safer alternative to statins, with potential improvements in other aspects of our health, such as motor endurance, nerve and brain function. NIE

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