Silica: health and beauty from nature

Silicon is the second-most-common element on earth, led only by oxygen, and is the second-most abundant element in the Earth's crust, where it is chiefly found in the form of silica or silicon dioxide (also called flint).

In terms of inorganic sources, it occurs mainly as oxide silica in sand and quartz and as silicates in such minerals as granite. Organic sources include the herb, horsetail, and certain foods (discussed below). For convenience sake, we can just refer to the dietary forms as "silica."

A trace element, silica is critical for healthy: bone; cartilage; organ and connective tissues (aorta, trachea, artery walls, ligaments and tendons); and for beautiful: hair, skin, and nails. Thanks to research by E.M. Carlisle, K. Schwarz, D.B. Milne, A. Charnot, R.H. Monceaux, J. Looper, E.J. Rus, L.C. Kevran, A. Weiss, A.T. Diplock, and others, we now realize that this element exerts a giant influence on our health and life.

Edith M. Carlisle, Ph.D., discovered that calcium and vitamin D alone are not sufficient for bone growth, density, strength, and flexibility. Other minerals, including traces of silica, are needed to strengthen bones and increase production of collagen, the tough, flexible connective tissue that binds everything together.

In fact, she noted in various studies that, with advancing age, silica disappears from the aorta, the heart's key blood vessel; consequently, connective tissue in it deteriorates.

Silica is what holds us up (and together)

Her studies on chicks in the 1970s and 1980s brought silica from its once-perceived unimportant status to essential. Studying the growth and metabolism of bones with and without silica in the diet of chicks, she made two discoveries: First, chicks on silica-supplemented diets showed a 100-percent increase in bone collagen over those not receiving dietary silica. Further, their bones revealed a slow, yet impressive, rise in calcium content, not shown in chicks receiving no dietary silica. Carlisle also found that tiny amounts of silica helped create faster and greater bone growth.

Carlisle established that a deficiency in dietary silica is an important – yet little considered – risk factor for osteoporosis and osteopenia.

Early research, in 1952, by A. Charnot determined that decalcification (the leeching away of calcium) is always preceded by the complete loss of detectable tissue silica. In 1972, Carlisle expanded on this, finding that silica influences the calcification process and the rate at which calcium is deposited in bone. She reported that animals kept on high-silica diets attained maximal bone mineralization much quicker than did those on low-silica diets.

Carlisle (in 1970) and K. Schwarz and D.B. Milne (in 1972) showed that rats and chicks fed silicon-deficient diets weren't able to achieve optimal growth and, actually developed deformed bones and skulls.

More recently (1986), Carlisle verified silica's role in connective tissue formation, noting that silica is a structural component of glycosaminoglycans (hyaluronic acids, chondroitin sulfates, and keratin sulfate) and their protein complexes.

While it is known that most body nutrients and glandular secretions diminish with age, the reduction of silicon is especially marked.
Silicon content of animal skin tissue and the thymus (the immune system's major gland) decreased with age so rapidly that the thymus gland of aged animals contained only two parts per million of silica, as contrasted with 56 parts per million for young animals: 1/28th as much!

**Helping to prevent Alzheimer's disease**

In their 1997 book, Prescription for Nutritional Healing, James F. Balch, M.D., and Phyllis A. Balch, C.N.C., point out another benefit of silica to our health as we age. "Silicon counteracts the effects of aluminum on the body and is important in the prevention of Alzheimer's disease and osteoporosis. Silicon levels decrease with aging, and, therefore, are needed in larger amounts by the elderly," say the Balches.

Silica may operate at a more basic level than that, in fact possibly hampering the bioavailability of aluminum, a metal that has been linked to dementia.

**Silica and the heart**

Carlisle also found that, with the departure of silica from the interior (intima) of artery walls, and with the weakening of its connective tissue, comes a greater risk of developing occlusive heart disease. The water connection? In the past generation, many studies have found that deaths from heart disease are far fewer in areas where drinking water is considered "hard." (Water is "hard" when it is "characterized by the presence of salts, as of calcium or magnesium, according to Webster's Dictionary.) This was reported as early as the 1960s by Henry Schroeder, then professor of clinical physiology at Dartmouth University Medical School.

Later, a study by Earl Dawson, Ph.D., director of nutrition research at the University of Texas at Galveston, revealed that the death rate from heart attacks and strokes is 25 percent lower in cities where people drink hard water. This was noted in a news story, "Hard Water Promotes Heart Health," issued by the University of Texas at Galveston, August 15, 1981.

However, there's a serious sin of omission in these and other studies: they invariably give full credit for these favorable outcomes to the role of calcium and magnesium in creating water hardness. Certainly, while these minerals play a critical part, silica should not be overlooked as being equally critical.

As noted in The Complete Book of Minerals for Health, silica is given due credit by Klaus Schwarz, M.D. Schwarz reviewed a survey of heart deaths in Finland, conducted between 1959 and 1974. The death rate from coronary heart disease in men of eastern Finland was two times higher than in men in western Finland. It should be noted that smoking and obesity were relatively the same in both groups. However, another factor impacted the researchers when they checked chemicals in drinking water in both places. Silica was absent from drinking water where coronary heart disease rates were twice as high and definitely present in the other area.

Schwarz continued studying silica this time in fiber, generally regarded as a non-food, which does little more than give bulk to waste matter and hurry it out of the system.

As reported in his book, Schwarz studied 337 British men for 10 years and discovered that those who ate the most cereal fiber suffered only one-fifth the heart disease of those who ate the least.

Closely examining many forms of fiber, Schwarz found that those richest in silica—alfalfa, pectin, rice hulls, and soybean* meal—were the most potent in preventing atherosclerosis. [* A very toxic bean.]

It is one thing for a nutrient to exist in a food and another for it to be absorbed. This poses a
question: is silica in fiber actually absorbed or does it just make a quick trip through the alimentary canal? There's evidence that it is absorbed.

As mentioned in Schwarz's book, a study by Thomas Bassler, M.D., of Centinela Hospital in Inglewood, California, analyzed hair samples of patients in a heart rehabilitation program and found that individuals on a daily high-fiber diet had appreciably elevated silica levels. Consequently, Bassler now puts all cardiac patients on a high-fiber diet.

His book rates foods according to their fiber content; the top 10 are: prunes, sweet potatoes, apples, spinach (cooked), potatoes, almonds, plums, and kidney and white beans.

**Silica and our diets**

Two main sources of silicon are drinking water and plant fiber. Most people get it through such dietary and supplementation sources as: the herb horsetail; alfalfa; beets; whole grains, including oats and brown rice; bell peppers; leafy green land-vegetables; seaweed; and blue-green algae.

In that it is difficult to ingest enough silica-rich foods to support health, the herb, horsetail (Eqisetum arvense) may help.

A fascinating book called the Amazing Medicines the Drug Companies Don't Want You to Discover highlights the main nutritional values of horsetail: "Horsetail is an excellent natural source of silica [...] Horsetail is also rich in calcium and several other minerals needed to rebuild injured tissue and is, thus, helpful in the healing of arthritis."

Horsetail has been used as a folk remedy for many centuries. It was mentioned as early as the 16th century for improving the heart, eyes, lungs, and kidneys. It was also used to strengthen weak bones, to alleviate arthritis (then called rheumatism), and to offset some damage caused by the excessive intake of alcohol.

**Silica’s many benefits**

Only trace amounts of silica are required by the human body, when supplied, this mineral does many things to keep us healthy:

- Improves cell metabolism and stimulates cell formation.
- Inhibits the aging process in tissues.
- Supplements tissue silica that rapidly decreases with age.
- Strengthens weak connective tissue and improves its structure and function.
- Increases the elasticity and firmness of blood vessels, making them less likely to develop atherosclerosis. (When silica rejuvenates connective tissue, artherosclerotic swelling vanishes.)
- Promotes anti-inflammatory, anti-infecting reactions.
- Stimulates the immune system to fight off disease-causing invaders – bacteria, viruses, and toxins.

**Silica for beautiful hair, skin, & nails**

Inasmuch as silica promotes healthy connective tissue, it is essential to a youthful appearance of the skin. Pronounced skin aging results mainly from inability of the skin's connective tissue to hold water, caused, in large part, by a deficiency of silica and hyaluronic acid.

Silica supplementation can, for many, enhance the appearance of hair and nails as well as skin.
Studies have shown that silica appears to be part of the synthesis of proline (a major constituent of collagen), which is required in the making of deoxycollagen. Also, the optimal working of "prolyl hydroxylase," an enzyme critical to collagen synthesis, depends on silica, according to a 1981 study by Carlisle.

And, we all know how important keratin and collagen are to the skin, hair, and nails.

Does silica have any mineral partners? In fact, it does. Boron, magnesium, manganese, and potassium help us properly make use of dietary silica. Iron and phosphorous, in particular, are needed for our bodies to help assimilate this trace mineral.

A wealth of benefits to our health, wellness, and appearance prove that this trace mineral is far from inessential, and is available in inorganic mineral (or primary source) varieties and in soluble, vegetal (secondary source) form.

[Editorial note: Since this article was written in 1997, a much more bioavailable form of silicon, called choline-stabilized orthosilicic acid (ch-OSA), has been formulated and proven in clinical studies to be at least 2.5 times more bioavailable than horsetail.]

REFERENCES


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