

Chokeberry extract found to regulate weight gain, blood glucose, and inflammation in rats

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Chokeberry bushes have for centuries been residents of eastern deciduous forests where their bright red and dark purple fruits continue to be favorite snacks of local bird species. Native Americans have also traditionally eaten dried chokeberries and prepared teas from parts of the plant, and several domesticated varieties now grace contemporary lawns and gardens from coast to coast. However, the chokeberry (Aronia) is enjoying a new claim-to-fame as a potentially powerful antioxidant, and can now be found for sale in the dietary supplement and "health food" aisles of your local pharmacies and grocery stores.

What makes the humble chokeberry so healthful? Scientists think the answer lies in their unusually high levels of substances called anthocyanins (from the Greek anthos + kyanos meaning dark blue). There are many different anthocyanins in these colorful berries, but they all function as antioxidants - originally protecting the chokeberry seed from sunshine-induced oxidative stress. And when we eat them, they also appear to protect our bodies from a variety of damaging situations, including exposure to pollution and metabolically-derived [free radicals](#). Indeed, a growing body of scientific literature has shown promising effects of chokeberry consumption on diseases ranging from cancer to obesity. These health-promoting effects may be due to the potent anti-inflammatory properties of anthocyanins, as uncontrolled inflammation is now universally recognized as a common thread in many of our most prevalent and deadly diseases. In addition, certain anthocyanins - including those found in chokeberry - have also been shown to improve blood sugar and the function of insulin.

To better understand how chokeberries influence health, Drs. Bolin Qin and Richard Anderson from the US Department of Agriculture in Beltsville, MD studied what happens when prediabetic rats are fed chokeberry extracts for an extended period of time. The results of their research will be presented on April 25 at the Experimental Biology 2010 meeting in Anaheim, CA. This presentation is part of the scientific program of the American Society for Nutrition, home of the world's leading nutrition researchers.

The researchers first made 18 male rats "prediabetic" or insulin insensitive by feeding them a fructose-rich diet for 6 weeks. Then they randomized the animals to continue drinking either pure water or water spiked with low or high levels of chokeberry extract (CellBerry®, Integrity Nutraceuticals International). After drinking this water for 6 weeks, the groups were compared in terms of body weight, body fat, [blood glucose](#) regulation, and molecular markers for inflammation.

Qin and Anderson found that at the end of the study the rats consuming the chokeberry-spiked water weighed less than the controls; both levels of chokeberry had the same effect in this regard. Similar beneficial effects of chokeberry consumption were found for body fat (specifically, that of the lower abdominal region). They also discovered that animals that had been drinking chokeberry extract had lower blood glucose and reduced levels of plasma triglycerides, cholesterol, and low-density lipoprotein (LDL) cholesterol when compared to the control animals. These alterations would theoretically lead to lower risk for diabetes and cardiovascular disease in humans. And to add even more evidence for a healthful impact of this super-berry, the researchers documented numerous alterations in expression of genes that would likely lead to reduced chronic inflammation and perhaps even lower cancer risk. For instance, drinking chokeberry extract lowered expression of the gene coding for interleukin-6 (IL-6), a protein that normally triggers inflammation following trauma or infection. Chronic

overproduction of IL-6 has been documented in many diseases such as diabetes, arthritis, and atherosclerosis and is thought to be a partial cause of these conditions.

Of course, human studies will be needed before scientists can declare whether we derive the same health benefits from the chokeberry, but Qin and Anderson believe that their study "provides evidence that the chokeberry extract inhibits weight gain in insulin-resistant animals and that it modulates multiple genes associated with adipose tissue growth, blood glucose regulation, and inflammatory pathways." A final word to the wise: raw chokeberries are exceptionally bitter, so don't be tempted to harvest the shrubs in your backyard. Instead, look for this unassuming berry in fruit juice blends, jellies, and sweetened syrups.

Provided by Federation of American Societies for Experimental Biology

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