

Tea contains more fluoride than once thought

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This is Dr. Gary Whitford of the Medical College of Georgia. Black tea, a Southern staple and the world's most consumed beverage, may contain higher concentrations of fluoride than previously thought, which could pose problems for the heaviest tea drinkers, Medical College of Georgia researchers say. "The additional fluoride from drinking two to four cups of tea a day won't harm anyone; it's the very heavy tea drinkers who could get in trouble," said Dr. Gary Whitford, Regents Professor of oral biology in the School of Dentistry. He presented his findings today at the 2010 International Association of Dental Research Conference in Barcelona, Spain. Credit: Phil Jones, Campus Photographer

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Most published reports show 1 to 5 milligrams of fluoride per liter of black tea, but a new study shows that number could be as high as 9 milligrams.

Fluoride is known to help prevent dental cavities, but long-term ingestion of excessive amounts could cause bone problems. The average person ingests a very safe amount, 2 to 3 milligrams, daily through fluoridated drinking water, toothpaste and food. It would take ingesting about 20 milligrams a day over 10 or more years before posing a significant risk to [bone health](#).

Whitford discovered that the fluoride concentration in black tea had long been underestimated when he began analyzing data from four patients with advanced skeletal fluorosis, a disease caused by excessive fluoride consumption and characterized by joint and bone pain and damage. While it is extremely rare in the United States, the common link between these four patients was their tea consumption - each person drank 1 to 2 gallons of tea daily for the past 10 to 30 years.

"When we tested the patients' tea brands using a traditional method, we found the fluoride concentrations to be very low, so we wondered if that method was detecting all of the fluoride," Whitford said, noting that the tea plant, *Camellia sinensis*, creates a quandary when measuring fluoride. Unique among other plants, it accumulates huge concentrations of fluoride and aluminum in its leaves - each mineral ranges from 600 to more than 1,000 milligrams per kilogram of leaves. When the leaves are brewed for tea, some of the minerals leach into the beverage.

Most published studies about black tea traditionally have used a method of measuring fluoride that doesn't account for the amount that combines with aluminum to form insoluble aluminum fluoride, which is not detected by the fluoride electrode. Whitford compared that method with a diffusion method, which breaks the aluminum-fluoride bond so that all fluoride in the tea samples can be extracted and measured.

He tested seven brands of store-bought [black tea](#), steeping each for five minutes in deionized water, which contains no fluoride. The amount of [fluoride](#) in each sample was 1.4 to 3.3 times higher using the diffusion method than the traditional method.

The new information shouldn't deter tea drinkers, as the beverage is safe and some teas even have health benefits, Whitford said. "The bottom line is to enjoy your favorite [tea](#), but like everything else, drink it in moderation."

Including Whitford's presentation, School of Dentistry faculty and students will make 24 oral and poster presentations at the International Association for Dental Research conference July 14-17.

Provided by Medical College of Georgia

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