

THE AUSTRALIAN FLUORIDATION NEWS

ARTIFICIAL FLUORIDATION
IS WATER POLLUTION



GPO Box 935, Melbourne, VIC 3001
www.fluoridationnews.com

FB: Australian-Anti-Fluoridation-Association

PLEASE PASS ON WHEN READ

Vol 55
No. 4

\$20 per annum posted Australia
Published Quarterly

October - December
2019

Print Post Approval
PP331.985 00013
ISSN 1445-2847

Green Tea and its Fluoride Content - a major Health Hazard

Green Tea has been lauded as a “healthy” drink and better than carbonated soft drinks. But Green Tea typically contains high levels of aluminium and fluoride, which can damage the teeth and the whole body through multiple mechanisms.

Geoff Pain PhD

Abstract

Green Tea is promoted as a healthy beverage yet few consumers are aware of the health risks caused by its Aluminium, Fluoride, Fluoroacetate, Heavy Metal, Oxalate and Polyphenol content.

Keywords: Aluminium, Anaemia, Asthma, Bai-mieng, Brick Tea, Camellia sinensis, Cancer, Cardiovascular Disease, Chemical Castration, Extract, Fluoride, Fluoro-acetate, Fluorosis, Genotoxin, Green Tea, Heart, Hepatitis, Hepatotoxin, Hypertension, Kidney, Kombucha, Leydig cell, Liver, Lung, Ovary, Oxalate, Polyphenols, Spina Bifida, Teratogen, Testes, Urolithiasis

Introduction

Fluoride is a Schedule 6 Poison. The acute lethal dose of Fluoride for humans is less than 5 milligram of Fluoride per kilogram of body weight. The World Health Organization (WHO) states that Fluoride is more toxic than Lead and slightly less toxic than Arsenic.

Fluoride is a bio-accumulative, endocrine disruptor that has no nutritional value [Pain 2016a].

Fluoride is a **teratogen** [leading to foetal abnormalities] [Fedrick 1974, Correa 2000, Wang 2004, Zielinsky 2013].

Therefore all allegations that there is an “adequate intake”, “optimal intake” or “tolerable upper intake” of Fluoride are completely false and misleading.

The question of what constitutes a “safe” dose of this bio-accumulative poison has been addressed using the criterion of predicted reduction in the IQ of exposed



children and is estimated to be 0.0010 mg Fluoride/kg-day [Hirzy 2016]. Clearly this implies that the commitment expected to be made by public health authorities should be to the ALARA principle, i.e. keeping exposure reduced to As Low as Reasonably Achievable.

Tea (*Camellia sinensis*) is a major source of Fluoride in the diet throughout the world.

Despite this, the Australian government, through its agency the National Health and Medical Research Council (NHMRC), deliberately excluded in its 2017 review on the health effects of water fluoridation, twenty-eight (28) peer-reviewed scientific papers relevant to the Fluoride content and adverse health impacts of drinking tea [Jack 2016].

The focus of this review is Fluoride content of Green Tea and its derivative products such as Brick Tea formed by compression, Kombucha formed by fermentation and instant packaged Green Teas. Tea also contains other

CONTENTS

Green Tea and its Fluoride Content - a Major Hazard 1
Brief News & Reviews: Tea Suggestions; USA F Case 4

toxins not covered in any detail here, such as Aluminium, heavy metals and Oxalate [Simpson 2001].

The toxicity risk of Green Tea has been evaluated [Sarma 2008, Zerabruk 2010, Janiszewska 2013, Atasoy 2016]. Human toxicity of Kombucha has been reported [Ernst 2003, Sunghhee Kole 2009] and its Fluoride analyses reported [Kumar 2008].

As Green Tea, Black Tea and White Tea all come from the same plant, the health impacts of Fluoride ingestion from Green Tea discussed here are generally applicable.

Fluoride content of Green Tea

The highest Fluoride concentration reported in any vegetation occurs in tea leaves.

The Fluoride content of Tea leaves can be 1,000 times the soluble Fluoride content of the soil and 2–7 times the total Fluoride content of the soil [Fung 1999]. A measurement of over 21,000 ppm was reported for one sample of black tea leaves [Michalski 2006].

Green Tea is produced from withered leaves that are steamed and rolled before drying to prevent the fermentation of the leaves, which occurs in making Black tea.

Brewed Green Tea has been found to contain very high Fluoride levels, e.g. nearly 7 mg/L (ppm) when made with deionized water [Chan 2010] and over 25 ppm in one Green Tea brew [Lung 2003]. Brick Tea, made from older leaves, has even higher Fluoride content.

Fluoride uptake is increased by the presence of Aluminium, probably due to the uptake of Aluminium–Fluoride complexes. Tea leaves are considered a hyper-accumulator of Aluminium. They can absorb up to 30,000 ppm of neurotoxic Aluminium [Matsumoto 1976, Shu 2003, Wong 2003].

Reports of the Fluoride content of Green Tea varies, with some finding lower Fluoride content than in Black Tea and others higher [Zerabruk 2010, Giljanović 2012, Zhu 2013, Embiale 2014, Atasoy 2016, Das 2017]. Given the Fluoride hazard, it is not surprising that the Tea industry has financially supported some research [Peng 2015].

Various assessments of Tea contribution to total daily intake have been reported [Pang 1992, Heilman 1999, Kao 2000, Malinowska 2008, Chan 2013, Peng 2015, Waugh 2016].

In temperate climates such as Britain excessive Tea intake was shown to contribute most to total intake of up to 8.9 mg of Fluoride per day [Walters 1983].

The pH of many brewed and bottled instant teas can be quite low [Simpson 2001, Behrendt 2002, Pehrsson 2011, Lunkes 2014, Reddy 2016] leading to a substantial amount

of corrosive and cariogenic Hydrogen Fluoride (HF) in the beverage [Hendricks 2013].

Measurement of Fluoride content by ion selective electrode can be affected by particle size, brewing time, pH and Aluminium [Borjigin 2009] content, so that published values might in some cases represent underestimates of the toxicity hazard. HF is not detected by a Fluoride ion selective electrode. Tactics used to improve analysis include the use of differentionic strength buffers including chelating agents for Aluminium such as tartaric acid, TRIS (tris(hydroxymethyl) methylamine), or trans-1,2-cyclohexanediamino N,N, N',N'-tetra acetic acid, and the use of the standard addition technique [Yuwono 2005, Reto 2008, Janiszewska 2013].

Ion chromatography using an alkaline eluant has been reported to be convenient for simultaneous measurement of anions present in Green Tea, which include Nitrate, Oxalate, Phosphate and Sulfate [Michalski 2006, Kumar 2008, Mincă 2013, Maleki 2016, Yang 2017]. Chewing gum incorporating Green Tea extract has been reported [Suyama 2011].

Harms associated with the Fluoride content of Green Tea

It is interesting that many studies alleging “benefits” of Green Tea completely avoid mention of the words Fluoride or Aluminium. It is also common to find reports dealing with the harms that avoid reference to Fluoride.

As has been pointed out many years ago [Schuld 1999], interpreting the literature on the effects of Green Tea is problematic because some papers consider a hot water extract as might be brewed from the dried leaves, others look at an aqueous ethanol extract, and some cover the swallowing of capsules containing either green tea powder or dried extract. Further complication arises as some researchers have reported on mixtures or pure isolated polyphenols from Green Tea.

Fluoride is a universal toxin that damages all types of mammalian cells

Because Fluoride is a universal toxin that damages all types of mammalian cells, the list of harms from drinking Green Tea will follow those observed by Fluoride from drinking water [Pain 2017a] including cataract blindness [Pain 2017b]. The following discussion covers harms so far identified arising through drinking of Green Tea.

Animal studies

In test animal studies, Green Tea treatment-related mortality attributed to liver failure occurred in male and female mice at a dose of 1,000 mg/kg and changes were seen in both rats and mice in the liver, nose, mesenteric lymph nodes, thymus, Peyer's patches, spleen, and mandibular lymph nodes [Chan 2010].

Skeletal Fluorosis and other Bone Disorders

The head of the Melbourne University Dental School in the state of Victoria, Australia, warned of the dangerous quantities of Fluoride in Tea in 1953, when industrial interests were planning to dispose of their waste through public drinking water supplies [Amies 1953]. The Australian National Health and Medical Research Council expressed its concern over the toxic levels of Fluoride in Tea in its meeting of 1954. In 1954, the NHMRC was most worried about skeletal

Some Reputable Info Sources on Fluorides and Health:

Book: Chris Bryson, “The Fluoride Deception” (2004)
Book: Dr Bruce Spittle, “Fluoride Fatigue” (3rd Edn, 2009)
Book: Dr Yiamouyiannis: “Fluoride: The Ageing Factor” (3rd Ed '93)
AFN: Past issues of *The Australian Fluoridation News*
DVDs: Fluoridegate & “Fluoride: Poison on Tap” (on Youtube)
FAN: www.fluoridealert.org/researchers/health_database
ResearchGate: www.researchgate.net/profile/Geoff_Pain
Fluoride Journal: www.fluorideresearch.org
GreenMedInfo: greenmedinfo.com/toxic-ingredient/fluoride

Fluorosis which was widespread in Queensland farming communities using bore water as well as workers in hot conditions who consumed upwards of 10 litres of water per day, including up to 4 litres of Tea.

Green Tea and isolated extracts from it are known to disrupt normal bone growth [Vali 2007, Isbel 2009, Iwaniec 2009]. **Skeletal Fluorosis is a crippling condition affecting tens of millions of people** [Li 2017] and **habitual drinking of Tea is recognized as a major factor** [Cao 1996, Cao 2005, Whyte 2005, Whyte 2008, Li 2009, Ge 2012, Kakumanu 2013, Chen 2014, Fan 2016, Yang 2016, Li 2017]. Due to instant-tea consumption, a patient developed severe skeletal fluorosis and had a serum Fluoride level of 7 µmol/L [Isbel 2010].

Osteopenia has been induced in mice fed Green Tea extract. Observed weight loss and failure to gain weight is consistent with lower femur length, volume, mineral content, cortical volume, cortical thickness, lower cancellous bone volume/tissue volume and trabecular thickness in lumbar vertebrae [Iwaniec 2009].

Allergy and acute adverse reaction

Double blind placebo testing has shown a percentage of people exhibit allergic reaction to Fluoride and it is possible that some Tea drinkers are unaware of the possible reactions, including heart arrhythmia, urticaria, exfoliative dermatitis, stomatitis, gastro-intestinal and respiratory allergy [Shea 1967]. Fluoride causes headache and migraine in some people so it is not surprising these ailments are experienced by some Tea drinkers [Seferoğlu 2012].

Green Tea affects the Thyroid...

Green Tea affects the Thyroid and its hormones and can induce goiter [Schuld 1999, Sakamoto 2001, Chandra 2010, Abulfadle 2015]. **Effects of Kombucha on mammal behaviour, as well as the organs, of test animals have been studied** [Hartmann 2000].

Catastrophic Liver Damage

Fluoride is a liver toxin in the adult mammal [Schmidt 2005, Galati 2006, Radha Krishna 2011, Kumar 2013, Patel 2013, Thangapandian 2013, Waugh 2015, Campos-Pereira 2017] and is also a developmental Hepatotoxin, causing DNA damage and apoptosis in human embryo hepatocytes [Wang 2004].

Green Tea and weight loss supplements using it are known to have caused catastrophic liver injury in humans, in some cases requiring liver transplantation [Gloro 2005, Bonkovsky 2006, Jimenez-Saenz 2007, Molinari 2006, Mazzanti 2009, Chen 2010, Stickel 2011, Lugg 2015]. **The weight-loss herbal supplement Exolise (Arkophama, Carros, France), which also contained Camellia sinensis, was withdrawn from the market because it was linked to multiple cases of liver injury.** The effects of Green Tea or its extracts on the liver include ductal metaplasia, inflammatory infiltrates, cholestasis, steatosis, and necrosis.

Altered Metabolism and Growth Inhibition

Green tea consumption decreases body mass, induces aromatase expression, and changes proliferation and apoptosis in adult male rat adipose tissue [Monteiro 2008]. Green Tea reduces Iron and Thiamine absorption [Grove 2015, Sachdev 2017]. These deleterious effects on food utilization might have been the basis of attempts to induce weight loss using Green Tea or its extracts [Sayana 2008].

Kidney Stones

Fluoride is a nephrotoxin [Pain 2017c]. **Urolithiasis kills thousands of people every year and many of the urinary stones contain significant Fluoride** [Herman 1958] with correlation found between drinking water, serum and urine Fluoride levels and Fluoride content of the stones [Rathee 2004]. **Kidney stones have been shown to contain up to 41,500 ppm Fluoride** [Jolly 1980].

Birth Defects

Green Tea drinking has been associated with teratogenic effects including anencephaly, heart damage and spina bifida [Fedrick 1974, Correa 2000, Zielinsky 2007; 2012; 2013].

Chemical Castration

Fluoride is known to be a chemical castration agent that probably works via multiple attacks on the male reproductive system through hormone disruption [Figueiroa 2009], direct destruction of the testes, damage to the epididymis [Sun 2017] and disruption of surviving sperm mitochondrial energy production. **There have been proposals to use Green Tea to deliberately reduce human population growth.**

Epigallocatechin gallate exacerbates fluoride-induced oxidative stress mediated testicular toxicity in rats through the activation of Nrf2 signaling pathway [Das 2015, Thangapandian 2015].

Reduction of female fertility by Fluoride involves damage to the ovary of mice [Yin 2015].

Damage to the Gut

Gastroesophageal Reflux Disease (GERD) has been linked to Green Tea with an Odds Ratio of 1.44 (95%CI 1.07–1.94) [Murao 2011]. This is not surprising given the highly corrosive effects of HF on the stomach [Koo 2004, Pain 2017d].

Skin Damage

Dermal hypersensitivity and asthma were induced in humans by green tea dust [Shirai 1994; 1997; 2003]. Damage to the Thyroid is known to adversely impact the skin.

High Blood Pressure

Green Tea ingestion causes larger acute increases in blood pressure than caffeine alone [Hodgson 1999]. High fluoride exposure increases plasma endothelin-1 (ET-1) levels. ET-1 enhances vasoconstriction and exacerbates hypertension and atherosclerosis by aggravating cell hyperplasia and vascular smooth muscle cell migration [Sun 2016].

Hardening of the aorta is observed with increased risk of rupture and sudden death [Pain 2016b].

Chronic Pain

Chewing Green Tea in the form of Bai-mieng in Thailand has been identified as a risk factor for chronic lower back pain [Namkaew 2012]. **This is not surprising since Fluoride deforms the vertebrae putting pressure on the nerves and can lead to rupture of inter-vertebral disks.**

Damage to the Teeth

Packaged Green teas have been measured with pH as low as 2.92 [Lunkes 2014, Reddy 2016]. These acid drinks cause tooth enamel erosion due to the HF formed.

Cancer

Green Tea displays carcinogenic potential [Bu-Abbas 1994]. Tea accelerates the appearance of skin tumors in mice [Bogovski 1977]. Green tea consumption increases human lung cancer risk [Tewes 1990].

Green tea stimulates cell proliferation in the liver [Schmidt 2005, Bun 2006].

Tea increases the amount of glutathione S-transferase placenta-form positive liver foci in multi-organ rat carcinogenesis [Hirose 1993].

Hormonal status is known to affect cancer risks due to various toxins. High green tea consumption may be positively associated with premenopausal thyroid cancer risk, but inversely associated with postmenopausal thyroid cancer risk [Michikawa 2011].

In the presence of Copper ions, Green Tea extracts damage DNA [Malik 2003]. This might induce cancer in a healthy person, or possibly assist with targeted cancer destruction therapy.

Further cancer risks associated with Fluoride ingestion from any source, including Tea drinking, are well known [Pain 2015; 2017e].

Attempts to Defluoridate Tea

Due to recognition of Fluoride as the major hazard in Tea, and the addictive devotion to Tea drinking, attempts have been made to suppress the flow of Fluoride to the brew [Kumari 2017]. Limited success was achieved, but unfortunately the technologies tried for defluoridation are very pH sensitive and can introduce risks associated with Aluminium and constituents in polymers used in adsorbents.

Harms associated with other constituents of Green Tea

Approximately 30–40% of the Green Tea leaves' solid extract is composed of polyphenols including catechins including epicatechin, gallate-3-epicatechin, epigallocatechin, and, predominantly, gallate- 3-epigallocatechin. The toxicity and endocrine disrupting potential of some of these polyphenols has been investigated [Johnson 1999, Kao 2000].

Epigallocatechin-3-gallate increases the formation of mineralized bone nodules by human osteoblast-like cells [Vali 2007].

Researchers have sounded a note of caution with regard to the consumption by women in the third trimester of pregnancy of foods with high concentrations of polyphenols, to avoid triggering constriction of ductus arteriosus, with its potential harmful consequences, such as foetal and neonatal heart failure and pulmonary arterial hypertension of the newborn [Zielinsky 2007; 2012; 2013]. **Aluminium is clearly a major hazard in Green and other Tea** [Matsumoto 1976, Shu 2003, Wong 2003, Borjigin 2009, Jayawardhane 2016] and has been briefly reviewed as part of the neurotoxic hazard associated with Fluoridation [Pain 2017f]. Aluminium toxicity in

association with Fluoride will be discussed in more detail elsewhere [Pain 2018a].

It is not widely known that Green Tea contains the potent neurotoxins Fluoroacetate and Fluorocitrate [Peters 1972]. Further details of these toxins will be discussed in relation to the Phosphate fertilizer problem and Fluoridation [Pain 2017g; 2018b].

Conclusion

Fluoride and Aluminium content of Green Tea makes it a drink that should be avoided by both men and women who wish to produce a family or want to avoid the chronic illnesses caused by those elements.

In line with pharmacy advice for Sodium Fluoride, pregnant women should not consume any Green Tea.

It would be useful if scientists who have reported harms caused by Green Tea, without mention of Fluoride, can return to their samples and report Fluoride content.

All Green Teas sold in Australia should include hazard warnings and be labelled for their Fluoride content in dry form and the estimated brewed content after standard and specified brewing conditions, with and without Fluoridated water.

Given that the Fluoride contamination of Green Tea comes from the soil, over the next few decades, the Tea industry will have to close down its existing plantations and relocate to areas of low soil Fluoride or investigate the possibility of hydroponics. However the risks posed by the polyphenols would remain.

References

See www.researchgate.net/profile/Geoff_Pain (10 pages)

Brief News and Reviews

Tea Drinking: Suggestions for Altering the Habit

Tea has very high fluoride content, even higher than tap water's 0.7-1.0 ppm (one part fluoride, per million parts water).

Unlike with tap water, we choose whether to drink tea. But for some, it can be the habit of a lifetime. Some suggestions:

1/ Reduce tea drinking and replace with a drink that works for you. Filtered water is great. Coffee has very little fluoride, but there are also pros and cons to coffee. Be aware fluoride hides in other beverages (e.g. soft drinks, reconstituted juices).

2/ Some tea drinkers are able to stop completely when they find out how much fluoride is in tea and the consequences.

3/ Whichever approach you take, don't worry about it. Be fully informed, choose what is right for you now & take action.

4/ In future, all types of tea may be tested and have the "ppm" marked on the packaging with a warning.

See *The Australian Fluoridation News*, "Fluoridation Causes Cancer - So does the Fluoride content of Tea" V.52 No.2 (2016).

USA Fluoridation Court Case now in April 2020

The case has been delayed and will run for two weeks from 20 April to 1st May 2020. with both sides having a week each. Prof Paul Connett may tour Australia around this time in 2020.

DISCLAIMER The articles in this publication are for educational purposes only and do not necessarily reflect the opinions of the editors or publisher. We do not endorse any treatments, medical or otherwise, and encourage our readers to continue with their own research and consult health professional(s) if they are ill.

ALL RIGHTS RESERVED Authorisation to mechanically or electronically copy the contents of this publication is granted by the publisher to approved persons and organisations, provided acknowledgement is given to the author and publisher.

Subscriptions: *The Australian Fluoridation News*

\$20 per annum posted Australia. Send a cheque or money order to the Australian Anti-Fluoridation Association, GPO Box 935, Melbourne VIC 3001