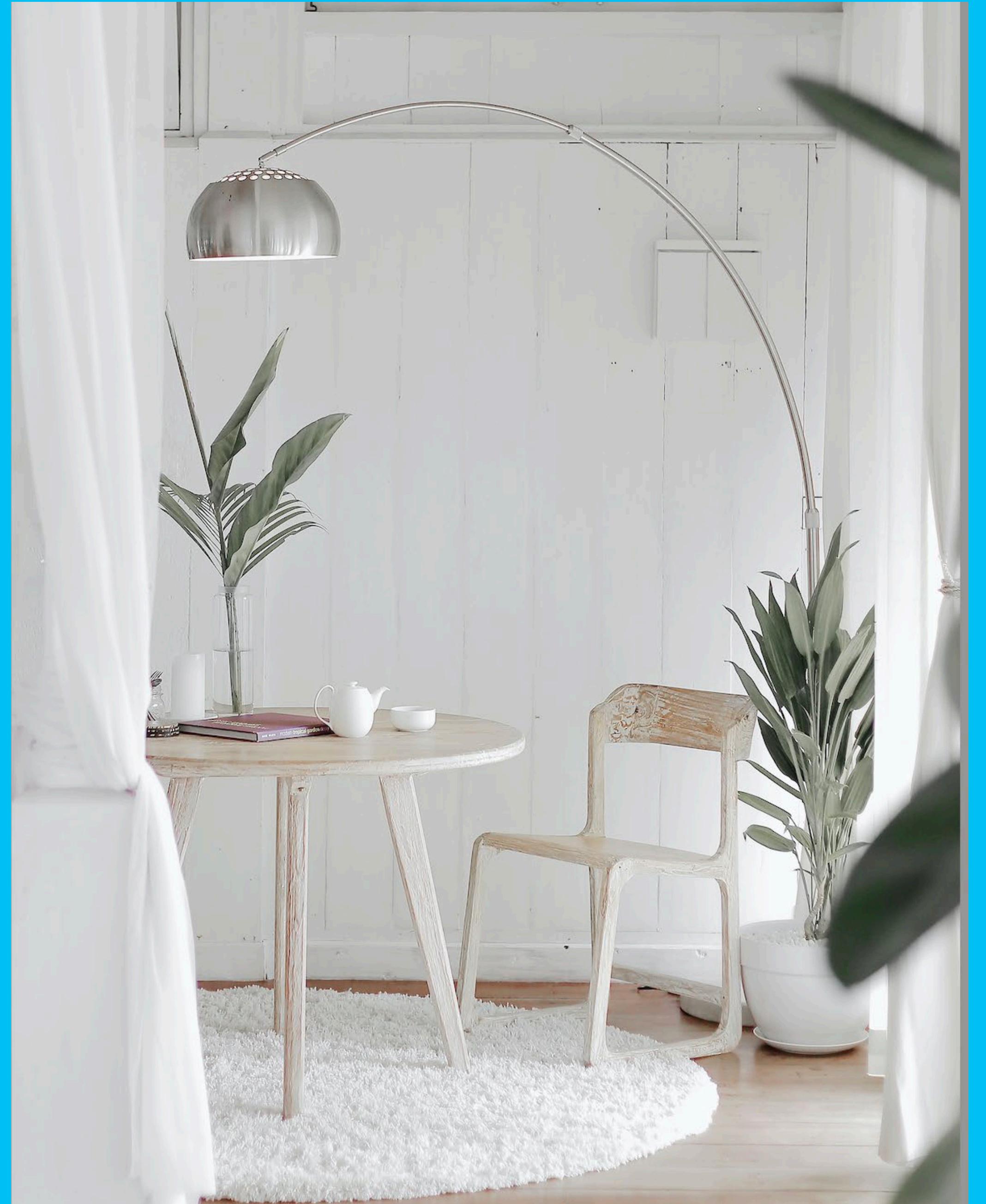


TEA

Harnessing the power of nature through tea

PAULA WEINBERG, JD, CNS, LDN, ONC



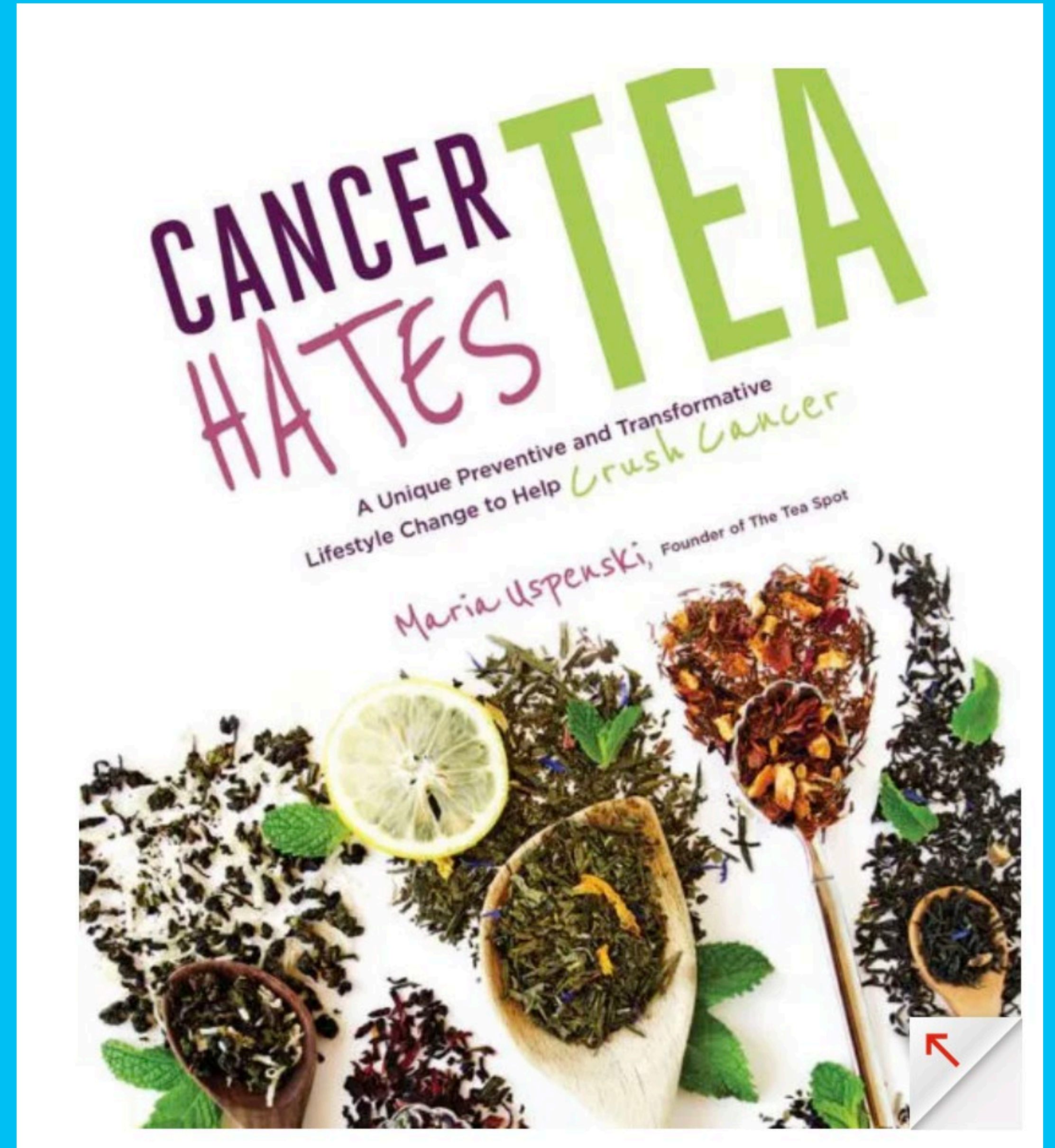
TEA = PLANTS

- **Antioxidants**
- **Immune regulating**
- **Anti inflammatory**
- **Hormone balancing**
- **Chemoprotective**
- **Toxic to tumor cells**
- **Inhibit metastasis**
- **Support apoptosis (cell death)**
- **Support healthy DNA**



CANCER HATES TEA

- All tea comes from the *Camellia sinensis* plant
- 4 kinds:
 - White/green tea
 - Oolong tea
 - Black tea
 - Pu-erh tea



WHAT'S IN GREEN TEA?

- Amino Acids (protein)
- Trace elements (minerals)
- Carbohydrates
- Lipids (fats)
- Phenolic acids (EGCG)
- Volatile Compounds
- Vitamins

Chemical composition of green tea

Amino acids

L-theanine
Tyrosine
Tryptophan
Threonine 5-N-ethylglutamine
Glutamic acid
Serine
Glycine
Valine
Leucine
Aspartic acid
Lysine
Arginine

Trace elements

Magnesium
Chromium Manganese
Calcium
Copper
Zinc
Iron
Selenium
Sodium cobalt
Nickel

Carbohydrates

Glucose
Cellulose
Sucrose

Lipids

Linoleic acid
 α -linolenic acid

Phenolic acids

Gallic acid

Volatile compounds

Alcohols
Esters
Hydrocarbons
Aldehydes

Vitamins

Vitamin A
Vitamin B2
Vitamin B3
Vitamin C
Vitamin E
Vitamin K

Figure 2. Chemical compounds of green tea.

Musial, Kuban-Jankowska, Gorsk-Ponikowska, Beneficial Properties of Green Tea Catchins. (2020). International Journal of Molecular Sciences. 22, 1744. doi:10.3390/ijms21051744

GREEN VS BLACK TEA

- Both contain catechins
- Black tea also has powerful health benefits
 - antioxidant
 - apoptosis
 - gene expression
 - detox
 - anti estrogenic

Int. J. Mol. Sci. **2020**, *21*, 1744

Polyphenol compounds of green and black tea

Green tea	Black tea
<ul style="list-style-type: none">• Epicatechin (EC)• Epigallocatechin (EGC)• Epicatechin gallate (ECG)• Epigallocatechin gallate (EGCG)	<ul style="list-style-type: none">• Theaflavin (TF1)• Theaflavin-3-monogallate (TF2a)• Theaflavin-3'-monogallate (TF2b)• Theaflavin-3,3'-digallate (TF3)

Figure 4. Comparison of polyphenol content in green and black tea.

Musial, Kuban-Jankowska, Gorsk-Ponikowska, Beneficial Properties of Green Tea Catchins. (2020). *International Journal of Molecular Sciences*. 22, 1744. doi:10.3390/ijms21051744

CAFFEINE

- **Least to most caffeine**
- **Even the strongest tea has only about 1/2 the amount of a typical cup of coffee**

Type	Flavor Profiles	Caffeine/Serving	Caffeine compared to 1 cup of coffee
White	Subtle, slightly sweet, floral or vegetal	10-15 mg	1/10
Green	Lively, vegetal, toasty or grassy	20-30 mg	1/5
Matcha	Thick, slightly sweet, umami	25-35 mg	1/4
Oolong	Complex, sweet, floral or toasty	20-40 mg	1/5-1/4
Black	Full-bodied, fruity, honey, malty or roasty, spicy or cocoa	40-50 mg	1/3
Pu-erh	Very full mouth-coat, fruity, woody, caramel	50-70 mg	1/2

From [Cancer Hates Tea](#), p 142

IS GREEN TEA GOOD FOR EVERYONE?

- **Genetic variations - COMT - can impact how catecholamines like EGCG are processed**
- **For those with a slow COMT gene, want to limit them so they don't add to stress/anxiety**
- **Others may need more green tea to reap the same benefits if they process catechols faster**



MATCHA

- Powder = green tea leaves
- More potent than brewed green tea
- More caffeine, more L-theanine
- Aluminum?
- Iron?
- Organic!!



WILL THE REAL TEA PLEASE “STEEP” UP?

- **Whole leaf tea**
- **Tea dust & fannings**
- **Tea bags - avoid the silky ones**



WATER

- Purity of water is important!
- Refrigerator filters are not enough
- [EWG.org](https://www.ewg.org) water database
- Tea kettle matters too!



HOW TO STEEP A PROPER CUPPA HOT TEA

1 rounded tsp of leaves
per 8 oz water

- Proper water temp
- Polyphenols infuse quickly so no need to over-steep
- Many whole leaf teas can be re-infused
- <https://www.japanesegreenteain.com/blogs/green-tea-and-health/everything-you-need-to-know-about-2nd-infusion>

HOT BREW STEEPING GUIDE

This is a guide that works well as a first-time steep. But if you don't like your tea the first time you make it, try steeping it with a bit more tea leaves and a little cooler water, and/or for a little less time.

Tea Type	Leaves per 8 oz (240 ml) Water	Water Temp	Steep Time
White	1 heaping tsp (2.5 g)	175°F (80°C) (or boil, pour, wait 3 minutes)	2 to 3 minutes*
Green	1 rounded tsp (2.3 g)	175°F (80°C) (or boil, pour, wait 3 minutes)	2 to 3 minutes*
Oolong	1 rounded tsp (2.3 g)	195°F (90°C) (or boil, pour, wait 3 minutes)	2 to 3 minutes*
Black	1 tsp (2 g)	boiling	3 to 5 minutes
Pu-erh	1 tsp (2 g)	boiling	2 to 5 minutes*

*Multiple steps—For many teas, you can re-infuse the same leaves two or more times. Just leave them to steep about a minute longer with each subsequent infusion.

PERFECT TEA WITHOUT A DIGITAL KETTLE

In the above chart are some guidelines for getting your water to the right temperature simply by boiling the water and letting it cool down a bit. There's another way to get there without a thermometer: an ancient Chinese method which is a great trick to know and works remarkably well. There are three key temperature ranges for steeping teas: 175°F (80°C) for white and green teas, 195°F (90°C) for oolong teas and boiling for black and pu-erh teas. The saying goes "a watched pot never boils," but did you know that you can actually see water get to those temps? Pour your freshly drawn water into a pot, and heat it on the stove. Just don't get distracted and wander off!

As soon as you see individual "fish eyes" at the bottom of the pot, your water's at the right temperature for white teas. Pairs of them appearing means go for green. Those fish eyes are nucleation sites appearing in the process of boiling. Translation: That's water changing states and the resulting vapor bubbles overcoming the heavier weight of liquid water.

When you see "strings of pearls" beginning to rise up from those nucleation sites (you'll know exactly what they are when you see them) your water's ready to steep oolong teas. This is honestly one of my favorite things about making darjeeling.

"Raging river" is the visual cue for boiling point—your water is experiencing a phase change full on ba-da-boom! This is the turbulence your black teas and pu-erh need to infuse their tough, oxidized leaves.

COLD BREW - DOES IT REALLY WORK?

- 2 heaping tsp loose leaf tea for 32 oz water
- Steep for 30-60 minutes in the fridge, 10-30 minutes at room temperature
- Strain the leaves out & serve
- White & green teas cold brew well
- Black tea doesn't cold brew well
- Oolong - use tea leaves sparingly w/ cold brew
- Pu-erh cold brews well also



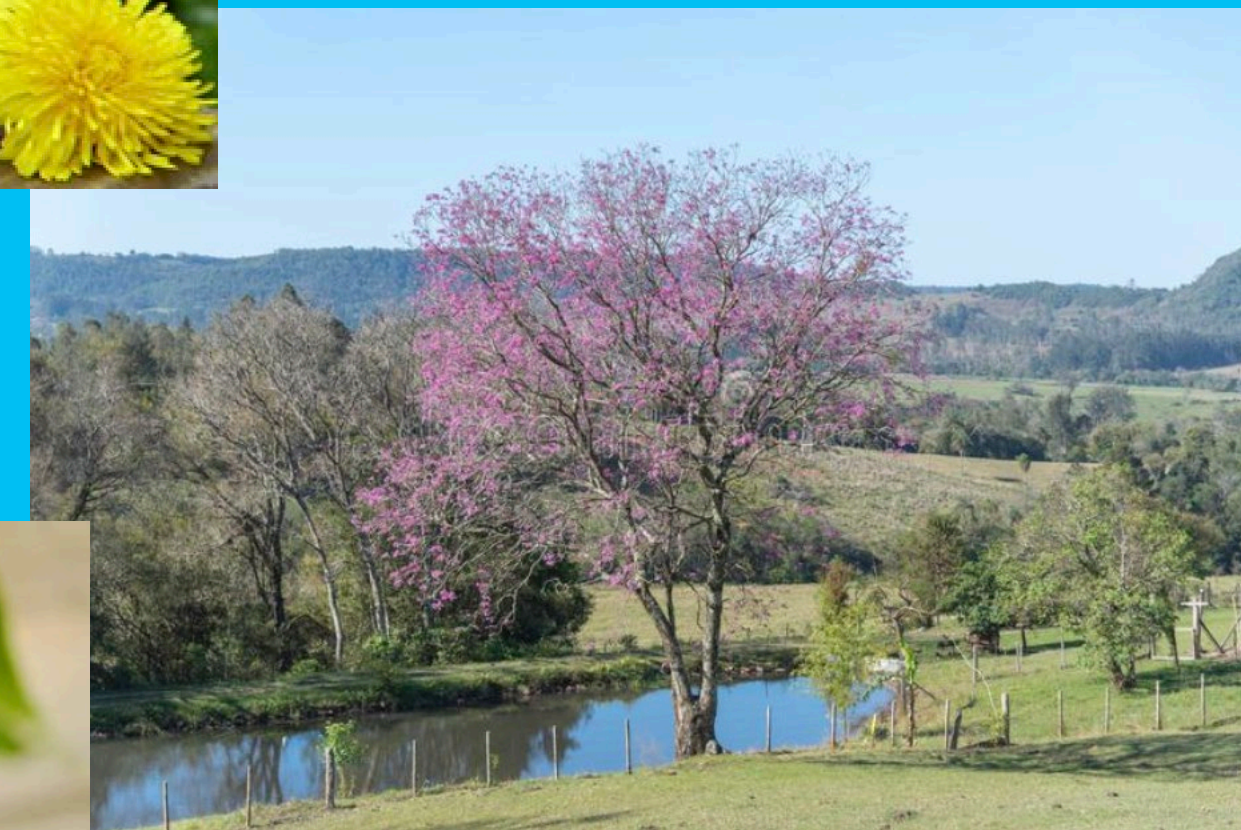
TEA = SLOWING DOWN

- **Mindfulness matters!**
- **Japanese tea ceremony**
- **Lost art of gratitude for the preparation & enjoyment of nature's bounty**



HERBAL “TEA”

- Herbals, fruits & florals
- Chamomile —> apigenin
- Hibiscus —> blood pressure
- Pau D’arco —> immune
- Dandelion —> detoxification
- Fennel —> digestion
- Essiac tea
- Jason Winter’s Tea



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