

Tea Culture in East Asia: A Multi-disciplinary Approach

NCTA-Ohio Seminar

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Self Introduction & a Survey

- Who drinks tea ?
- Who prefers tea to coffee?
- Which nations produce tea?
- Your image of tea?



- Global tea production doubled between 1995 and 2015 to 5,305 million metric tons (Bolton, 2016).
- PRC and India are the biggest producers (38%, 24%) and consumers (33%, 21%) of tea in the world. (Chang 2015).
- The biggest consumer **per person** is Turkey (2.87 Kg/person/year).
- There are tea-drinking nations (Turkey, UK, China, Japan, India,) and coffee-drinking nations (Finland, Norway, Iceland, Denmark Netherlands).
- US consumption of tea is 0.2 Kg/person/year

It's tea time!: Make tea

- **Teams A & B: Japanese green**

Use top chamber, 65-degree water, 10 seconds infusion, extract liquid as completely as you can

- **Teams C & D: Chinese Pu'er**

Use top chamber, 95°C water, flush pot, flush leaves, 30 second infusion, extract liquid)

Tasting Notes: Describe & Evaluate

1. Basic Information (type; name, if known; production area; production year, if known)
2. Appearance of the liquid & leaves
3. Aroma (grassy, woody, earthy, floral, marine, spicy, empyreal, etc)
4. Flavor (bright, mellow, astringent, sweet, full, smooth, powerful, long, short, etc.)

Basic Information

- **Japanese green**

Chiran cha, from Minami-Kyushu, Kagoshima prefecture, 2019



- **Chinese Pu'er**

Gu Shu (Ancient tree) from Tianyue, Yunnan Province, 2006





Practice

Camellia Sinensis, the Plant

Growing Regions (Terroir)

Taste & Describe

Art

Tea in Food

Process & Variety

Chemistry
Health
Beauty



Socialization

History

Tea, Cha, Chai

Religion

Trade

Tea Producing Regions in East Asia



- Soil
 - Acidic soil
 - Rich in minerals (N, P, Mg)
- Climate
 - Tropical / subtropical, high humidity
 - Temperature 65-68° F (18-20° C)
- Altitude
 - 1,000 – 1,500 m (3,300 – 5,000 ft)
 - Kunming, China = 1,939 m (6362 ft);
 - Taipei = 707 m (2,320 ft)
 - Mt. Fuji, Japan = 2,333 m (7,654 ft)
 - Columbus = 238 m (780 ft);
- Latitude
 - 16° or more N/S of the equator for dormancy (improved aroma)



China

NORTH of THE YANGZI
Xin Yang Mao Jian (green)
Lu An Gua Pian (Green)

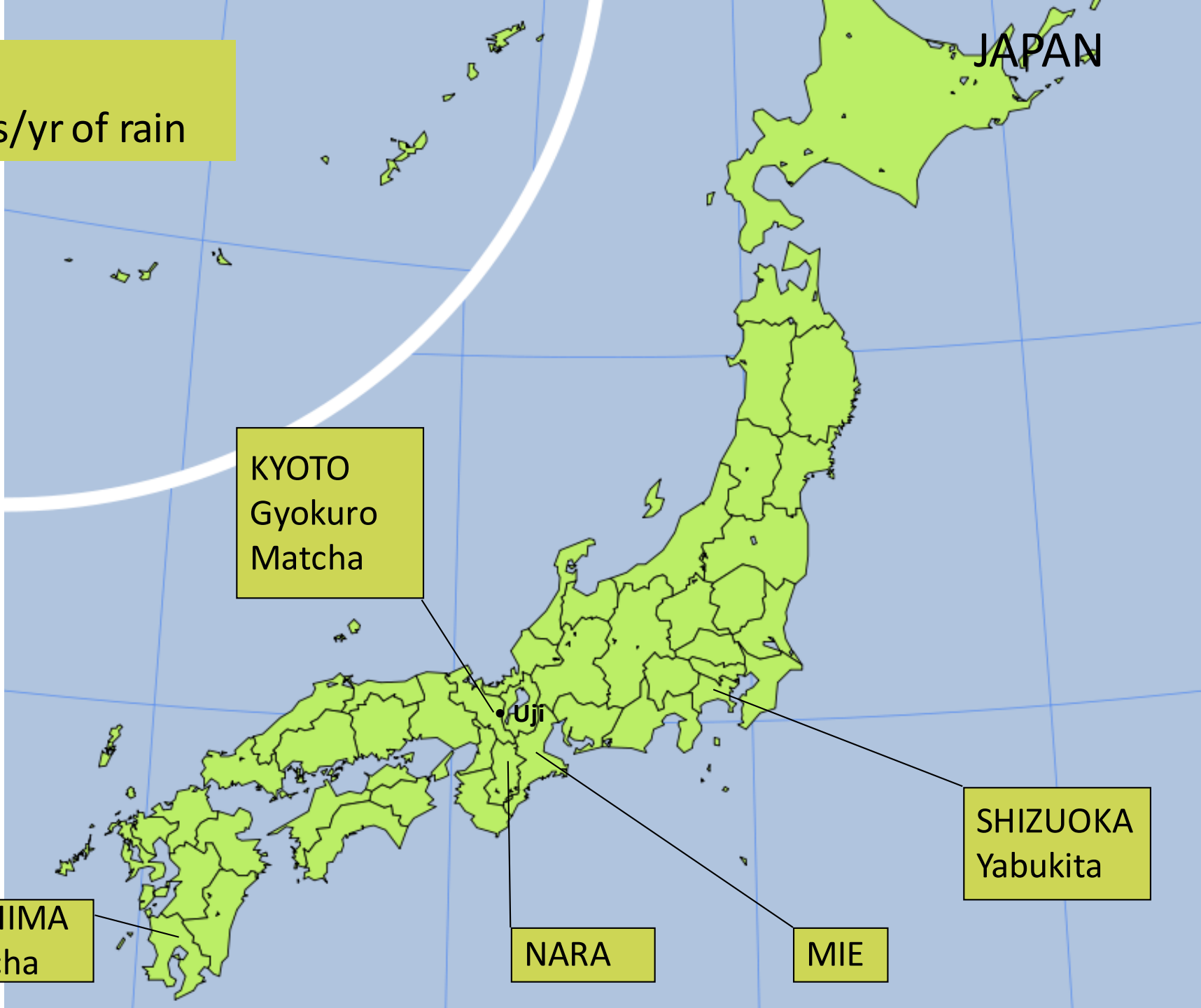
SOUTH of THE YANGZI
Long Jing (Green)
Mao Feng (Green)

SOUTHWEST
Pu'er (Pu'er)
Hong Gong Fu (Black)

SOUTHEAST
Tie Guan Yin (Oolong)
Da Hong Pao (Oolong)
Bai Hao Yin Zhen (White)



50-65F;
60 inches/yr of rain



JAPAN

KYOTO
Gyokuro
Matcha

Uji

SHIZUOKA
Yabukita

KAGOSHIMA
Chiran-cha

NARA

MIE

Tea Garden in Shizuoka



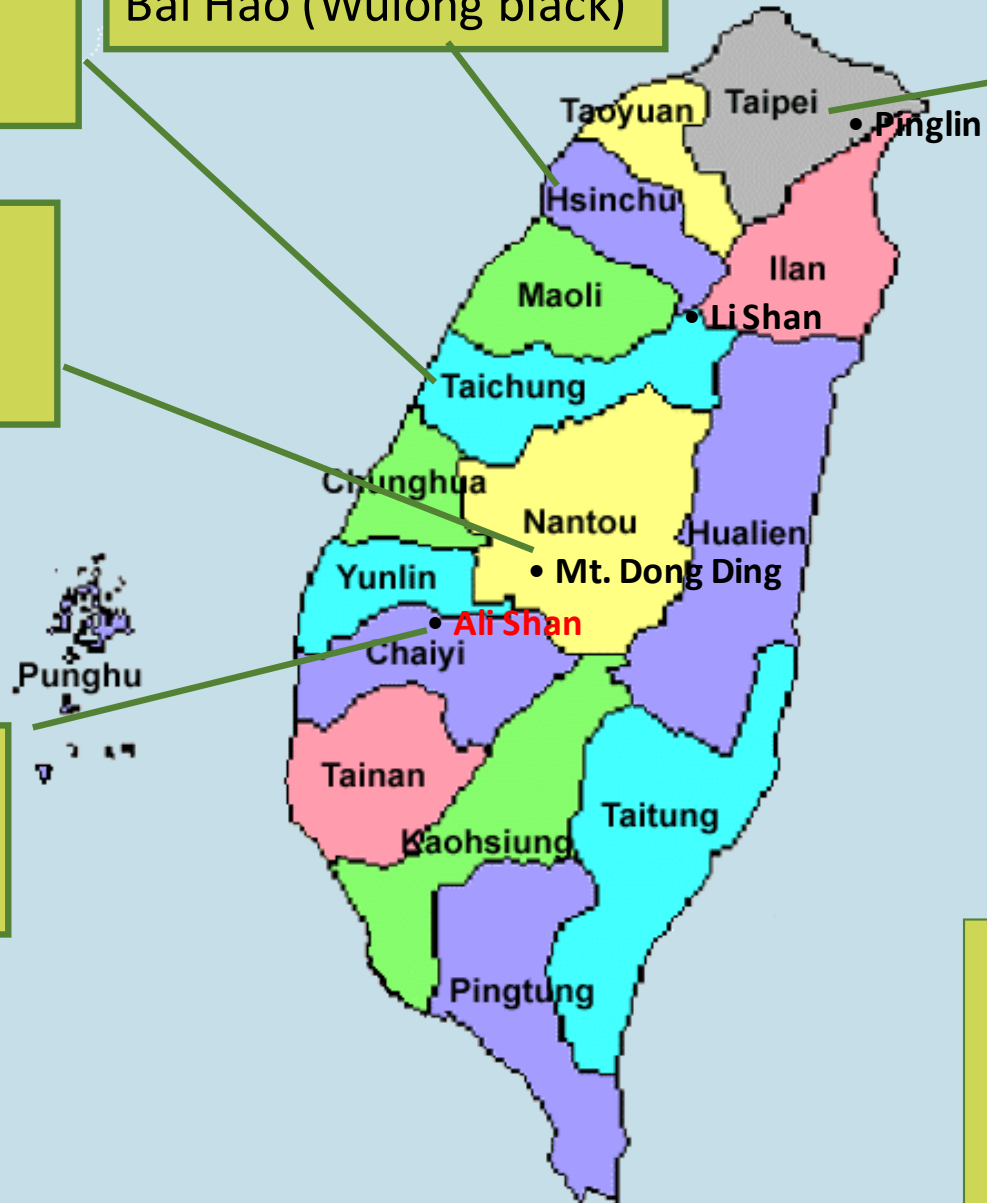
TAICHUNG
Li Shan (5,250 – 8,700 ft)
Hi-altitude high quality teas

HSINCHU
Bai Hao (Wulong black)

TAIPEI
Pinglin
The Mucha Mountains

NANTOU
Mt. Dong Ding (2,600 ft)
Mt. Shan Lin Xi (5,400 ft)

CHIA YI
Ali Shan (2,300 – 5,600 ft)
Yu Shan (4,200 ft)



Gao Shan Cha
'High Mountain Tea'
3300 ft +

高山茶



Jeju

Boseong

Mt. Jirisan

Hadong

JAPAN

Variety of Tea and Production Process



Withered					
Dried	Fixed	Fixed	Rolled	Fixed	Rolled
	Dried	Wrapped	Oxidized	Rolled	Oxidized
		Dried	Dried	Fermented	Fixed
					Dried
White	Green	Yellow	Black/Red	Fermented	Oolong
<i>Bai Mudan</i> 'White Peoty'	<i>Xi Hu Long Jing</i> 'Dragon Well' <i>Gyokuro</i> Jade Dew'	<i>Junshan</i> <i>Yinzhen</i> 'Mt. Jun Silver Needle'	<i>Jin Jun Mei</i> Golden Beautiful Eyebrow	<i>Yunnang</i> <i>Sheng Pu'er</i> <i>Shou Pu'er</i>	<i>Da Hong Bao</i> 'Big Red Robe' <i>Dong fang Meiren</i> 'Oriental Beauty'

Enzymatic Oxidation

- Oxidation: A loss of electron when two or more substances interact.
 - e.g., Cut apples turning brown in contact with oxygen in the air
- Enzymatic Oxidation: Oxidation that occur in the presence of an **enzyme**.

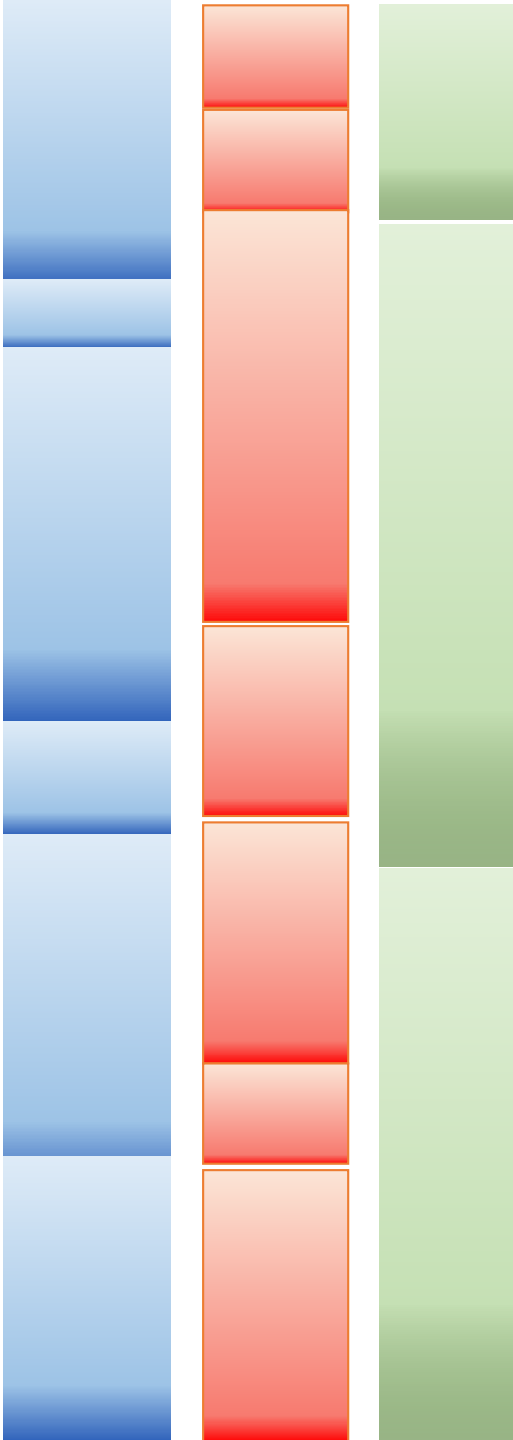


- **Fixing: Heating** kills the enzyme responsible for enzymatic oxidation

Microbial Fermentation

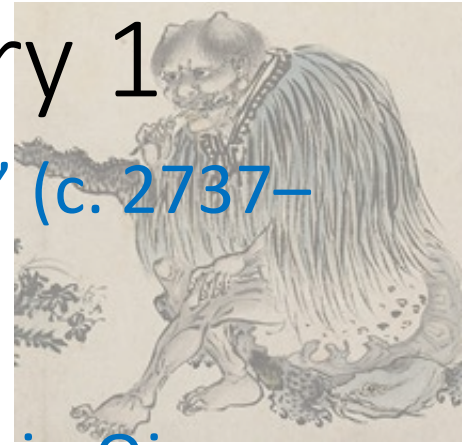
- Fermentation: metabolic process that results in chemical changes in organic substance.
 - e.g., Yogurt, beer, cheese, kimchi

3500 BC
Shennong 2700 BC
Zhou
1027–256 BC
Qin
332–306 BC
Han
206BC–220AD
Six Dynasties
220–586
Sui
581–618
Tang
618–906



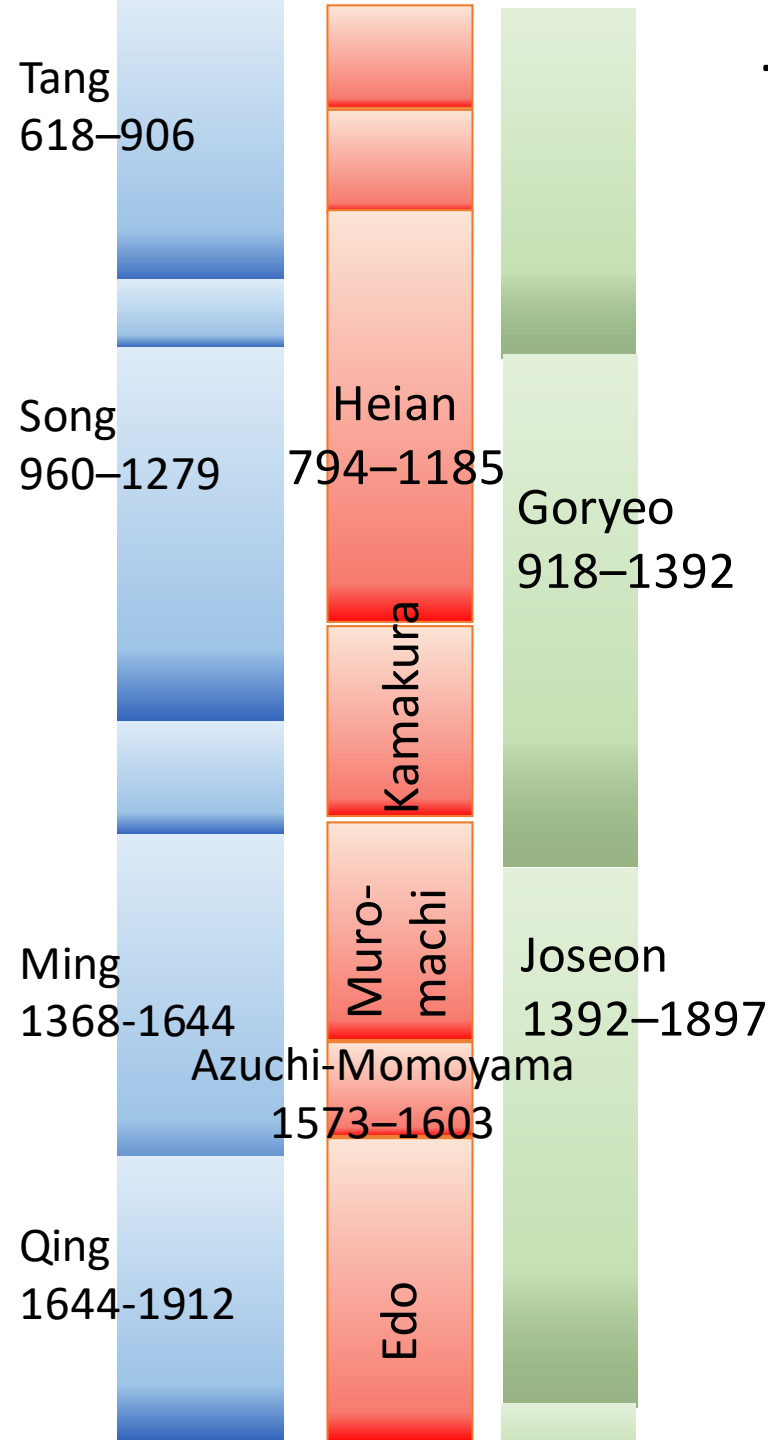
Tea in East Asian History 1

- Myth of Shennong ‘Divine Farmer’ (c. 2737–2698 BC)
- Confucius (551 – 479 BC)
- “People learned how to drink tea” in Qin Dynasty
- Cultivation of tea started during Han Dynasty (50 BC)
- Bodhidharma arrives in China during the 5th–6th Century (Six Dynasties), meditation spreads
- Lu Yu (733–804), “Sage of Tea” writes *Classic of Tea* (Tang Dynasty)



Tea was
soup!

Tea in East Asian History 2

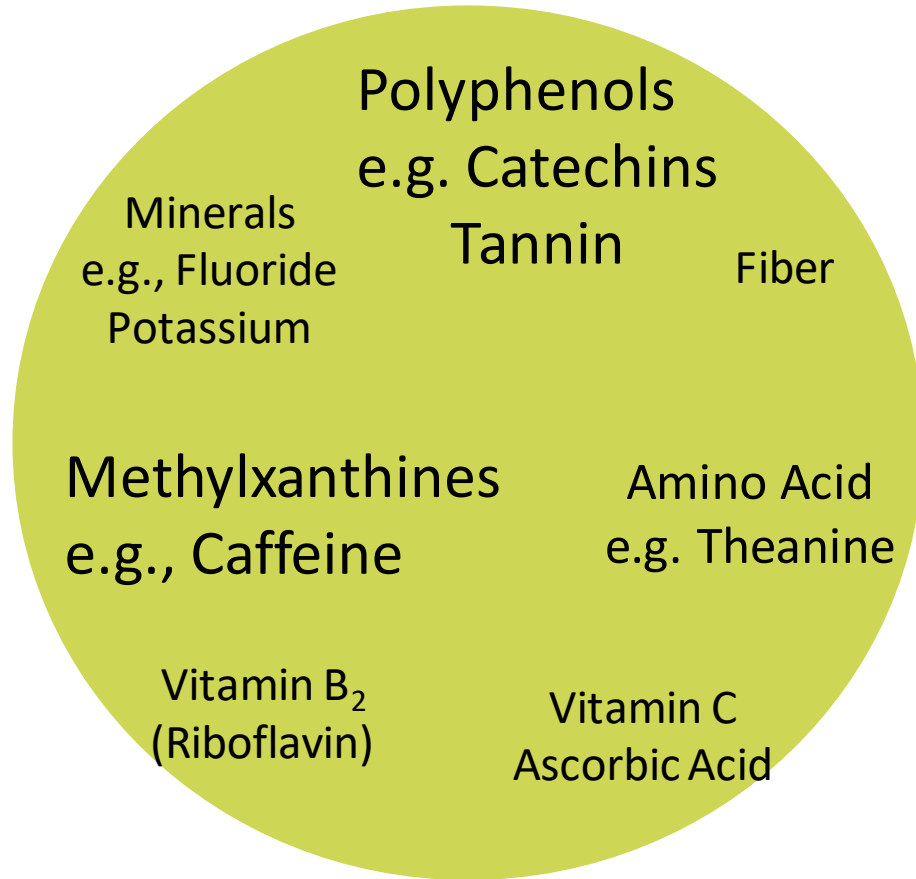


- Buddhist priests return to Japan from China with tea (805, 806)
- Buddhism flourishes in Goryeo Dynasty Korea, green tea offered & consumed (10C-14C)
- First comprehensive book on tea in Japan, *Kissa Yōjōki* (tea-drinking cure), is written by priest Eisai (1211)
- Steeped (rather than whisked) tea spreads in Ming Dynasty China
- Confucianism becomes the official religion (1350's), tea is consumed less in Joseon Korea.
- Tea contest develops into tea ceremony in 14C–16C. Japan
- New types of tea are produced in Ming China
- Tea houses flourish in Qing China
- Boston Tea Party (1773)

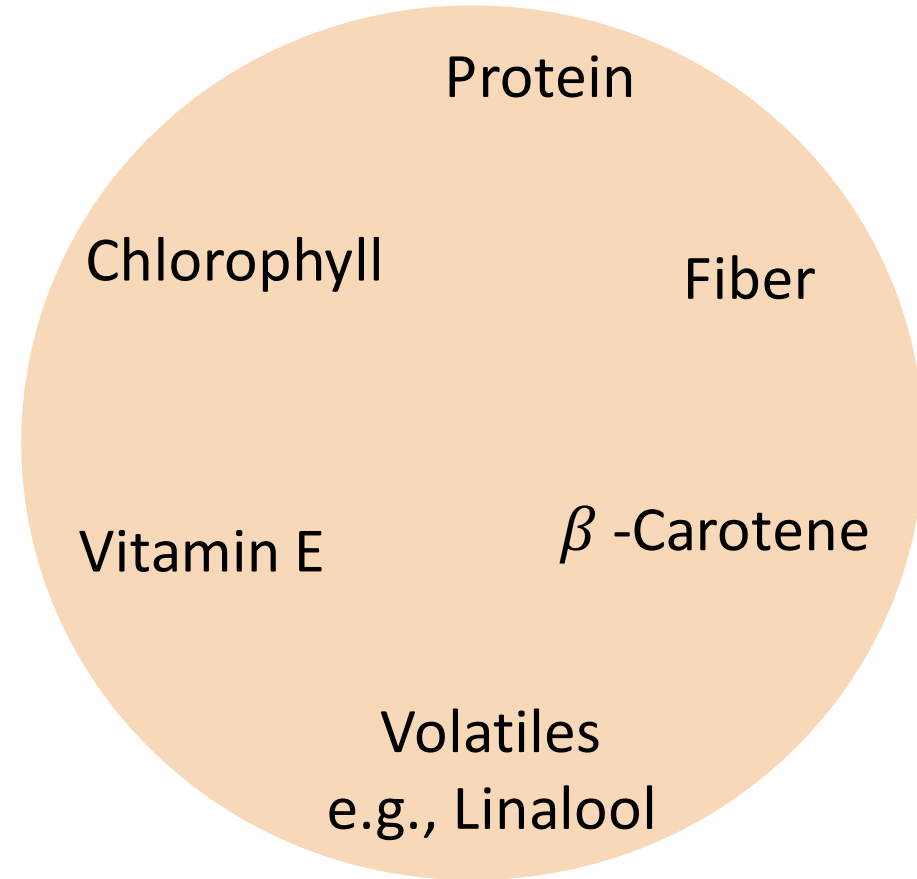


Tea and Nutrition

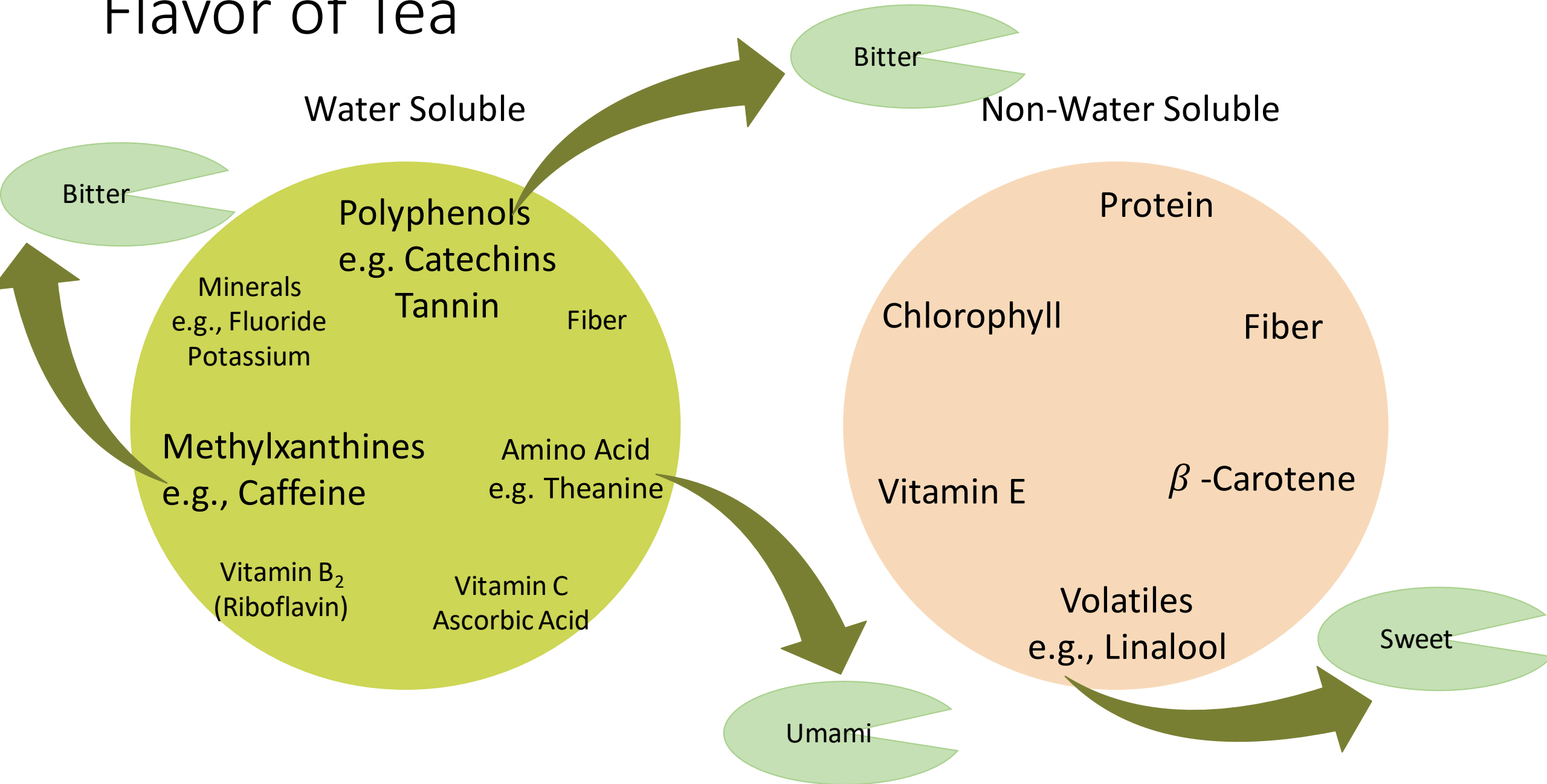
Water Soluble



Non-Water Soluble



Flavor of Tea



Antioxidants in tea

Catechins represent 2-8% of the mass of dry leaves

Catechin (C)

Epicatechin (EC)

Epigallocatechin (EGC)

Epicatechine gallate (ECG)

Epigallocatechine 3-Gallate (EGCG)

Beverages	Antioxidant ORAC values in moles/250 ml
Red Grape Juice	4,500
Matcha	3,100
Strawberry Juice	1,600
Long Jing Shi Feng Green tea	2,500
Cranberry Juice	2,200
Darj. Sungma black tea	800

Antioxidants (free radical “Scavengers”)

- Suppresses high blood pressure
- Controls blood LDL (“bad” cholesterol) level (esp. EGCG)
- Raises blood HDL (“good” cholesterol) level
- Controls blood glucose level

Wikipedia, NIK

Only 20~30% of water soluble chemicals are extracted in the water. The rest remains in the tea leaves.

(NIK 2008:128)

Caffeine (Trimethylxanthines)

Stimulant to Central Nervous System

- Prevents drowsiness
- May cause insomnia
- May produce dependence
- Withdrawal symptoms

Tea Type	Infusion in 250 ml (except matcha), water temp. length	Caffeine*
Matcha	1.5 g in 100 ml, 75°C, 30 sec	126 mg
Black tea	5 g, 95°C, 3.5 min	58 mg
Green tea	5 g, 65°C, 4.5 min	65 mg
Pu-er	5g, 95°C, 4.5 min	25 mg
White tea	5 g, 80°C, 6 min	39 mg
Oolong	5 g, 95°C, 4.5 min	49 mg

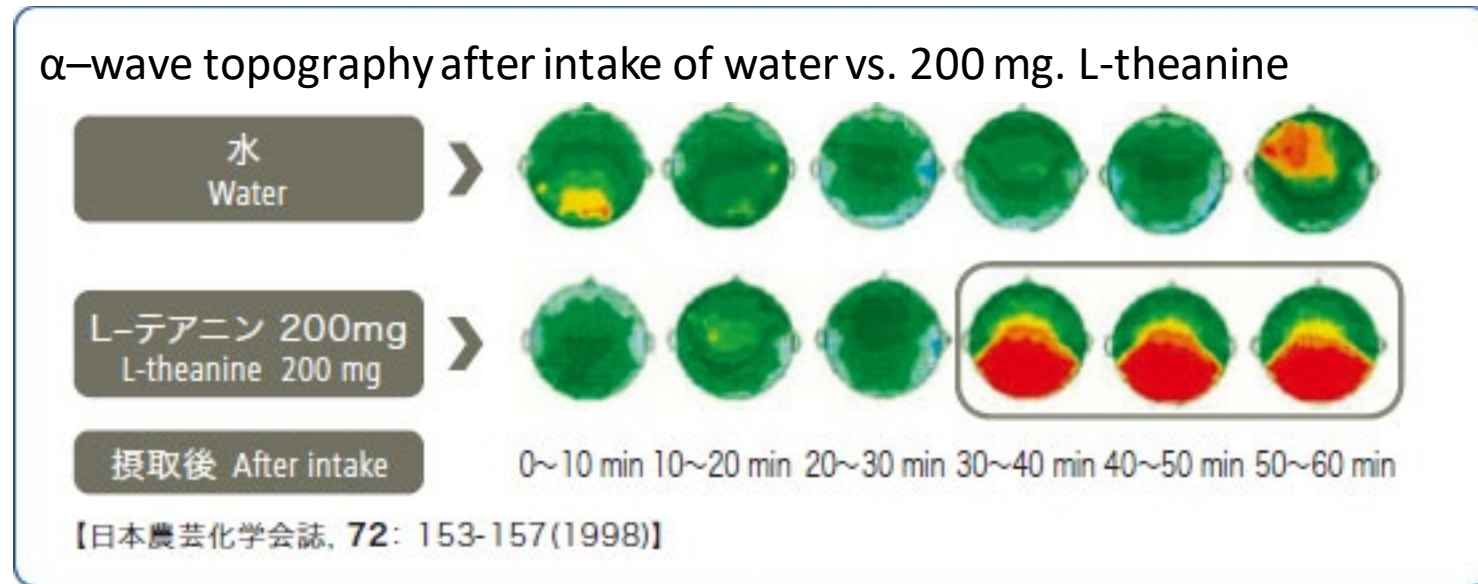
* Caffeine amount varies among specific teas. From Gascoyne et al. p.270

Concentration increases with

- Longer infusion
- Higher water temperature (above 85° C)

Coffee	Quantity	Caffeine
Coffee	1 cup	85–100 mg

Theanine (T) & Relaxation



Kobayashi et al. 1998, cited in NIK

Produces α -waves

- Causes **relaxation**
- Improves concentration
- Enhances alertness

α -wave appears 30 minutes after intake of L-theanine



Seven Bowls of Tea

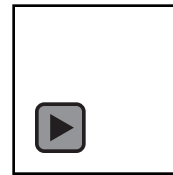
By Lu Tung (790–835, Tang Dynasty)
(tr. Steven R. Jones, 2008)

The first bowl moistens my lips and throat;
The second bowl breaks my loneliness;
The third bowl searches my barren entrails but to find
Therein some five thousand scrolls;
The fourth bowl raises a slight perspiration
And all life's inequities pass out through my pores;
The fifth bowl purifies my flesh and bones;
The sixth bowl calls me to the immortals.
The seventh bowl could not be drunk,
only the breath of the cool wind raises in my sleeves.
Where is Penglai Island, Yuchanzi wishes to ride on this sweet breeze and go back.

七碗诗

卢仝

一碗喉吻潤，
二碗破孤悶，
三碗搜枯腸，
惟有文字五千卷，
四碗發輕汗，
平生不平事盡向毛孔散，
五碗肌骨清，
六碗通仙靈，
七碗吃不得也，
唯覺兩腋習習清風生。
蓬萊山，在何處，玉川子
乘此清風欲歸去。



Dorman, 2014;
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Local Resources

- Zencha Tea Salon (982 N. High; 2396 E. Main)
- Belle's Bread (1168 Kenny Centre Mall)
- Short North Coffee House (1195 N. High)
- Cambridge Tea House (1885 W. 5th Ave.)
- Tea Zone Bakery & Café (5025 Olentangy River Rd.)