
Let`s Enjoy Green Tea !
Noboru Masui

What is Green tea ?

- *Camellia sinensis*

  familly : theaceae (ツバキ科)

  genus ： camellia(カメリア属)

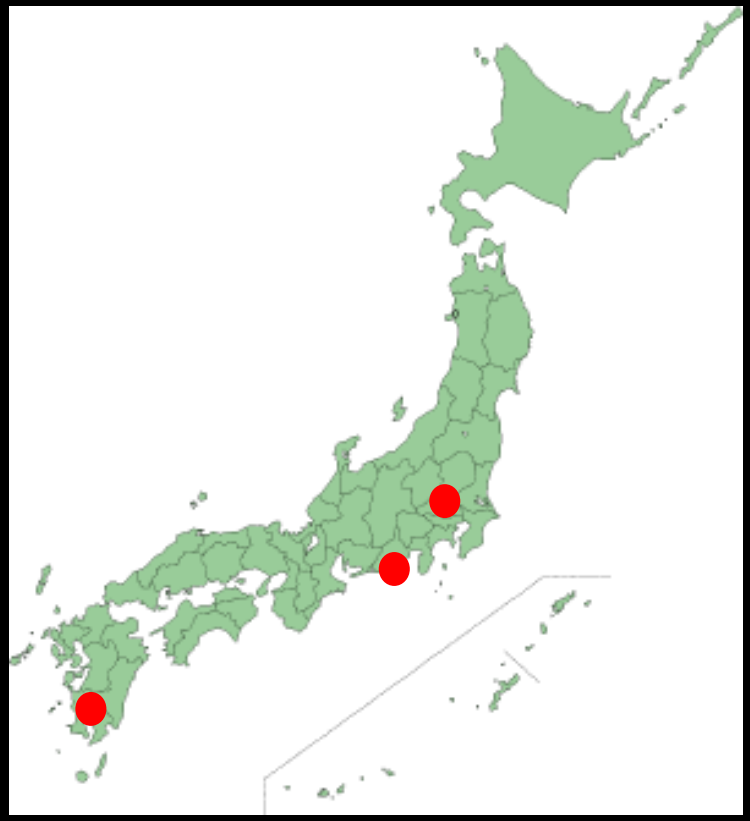
- Cultivation condition

  precipitation : 1300〜1500mm / year

  soil condition : ph5~6 (weakly acidity soil)

  （ex. ● Makinohara in Shizuoka, Satsuma in Kagoshima

  Sayama in Saitama



What is Green tea ?

- types

  中国種 (Chinese)　　Catechin ＜ amino acid

  アッサム種　(Assam)　　Catechin ＞ amino acid

- <u>All teas are made from same resource of leaves</u>

  無発酵茶…Green Tea

  半発酵茶…Oolong

  発酵茶　…Tea

  発酵茶　…その他、プアール茶など

  ※発酵 ≒ fermentation

} different degree of wilting (萎凋)

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In japan,
this type is used

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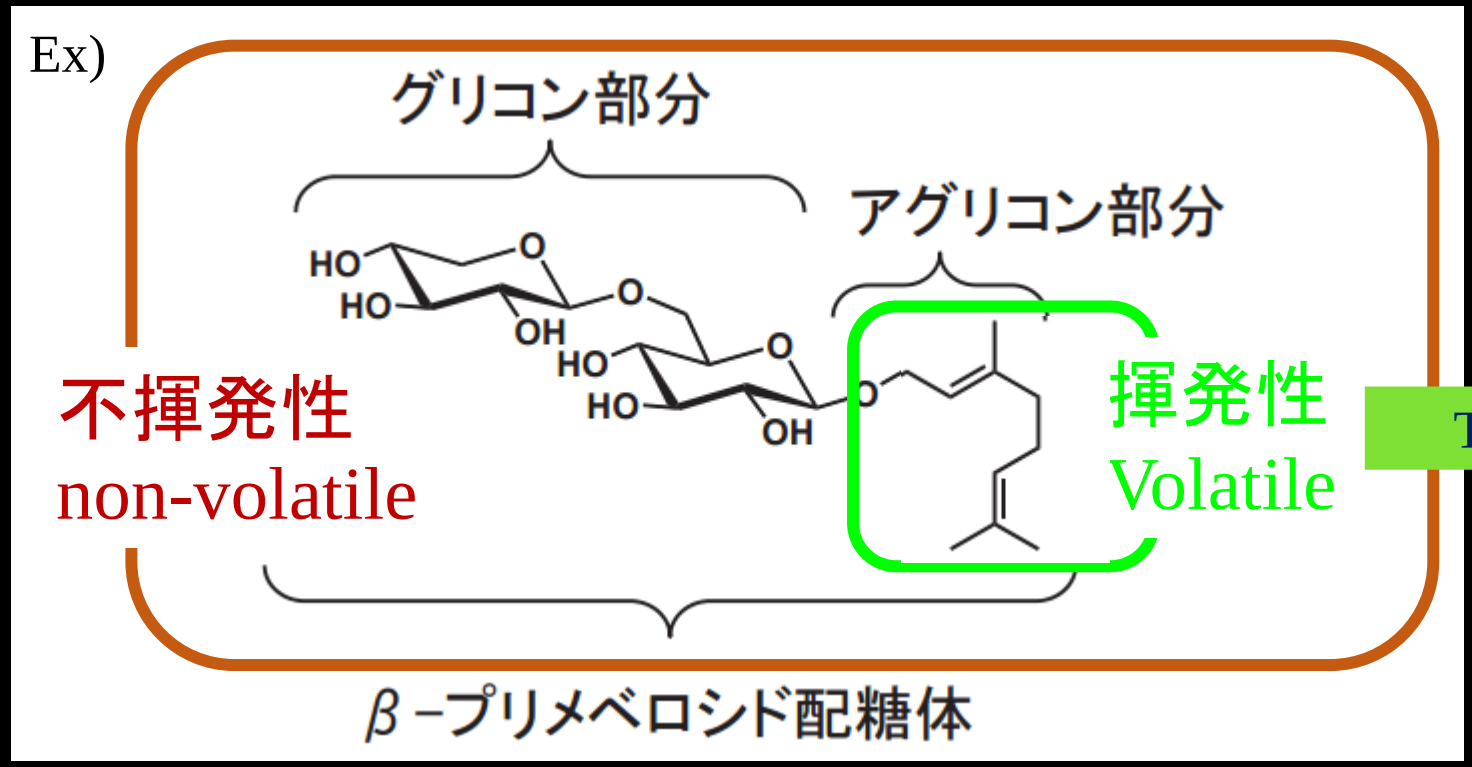
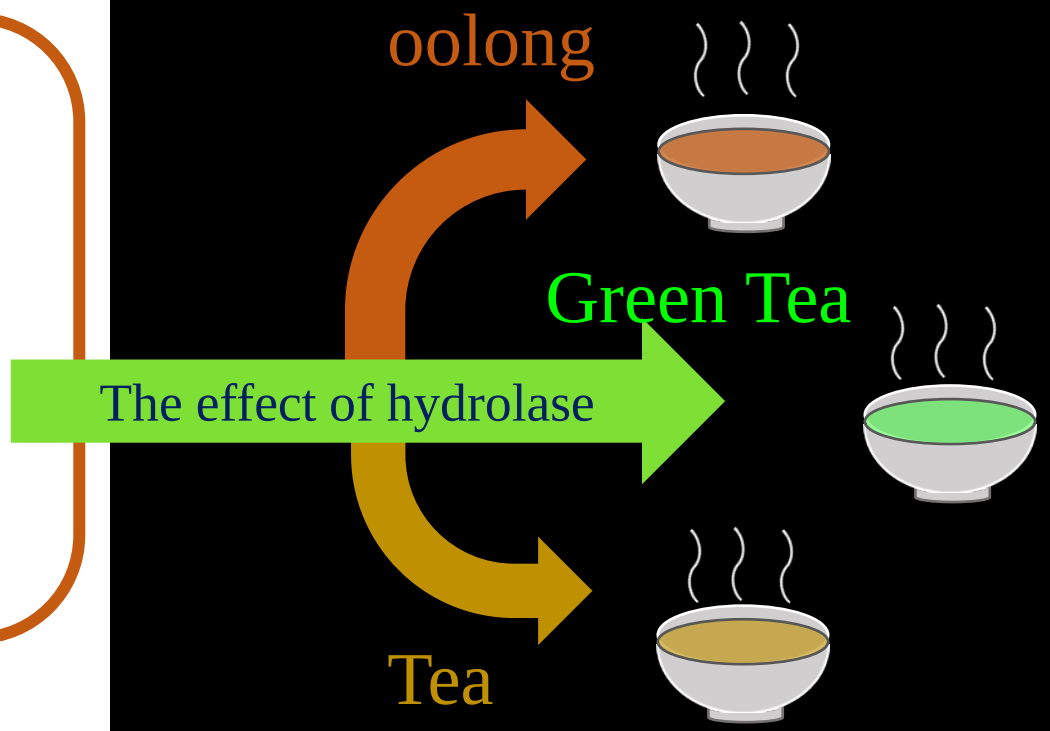
How are flavors released from teas ?

[In laeves]

[Flavor]





Each tea have unique flavors dependent on different activation of the enzyme.

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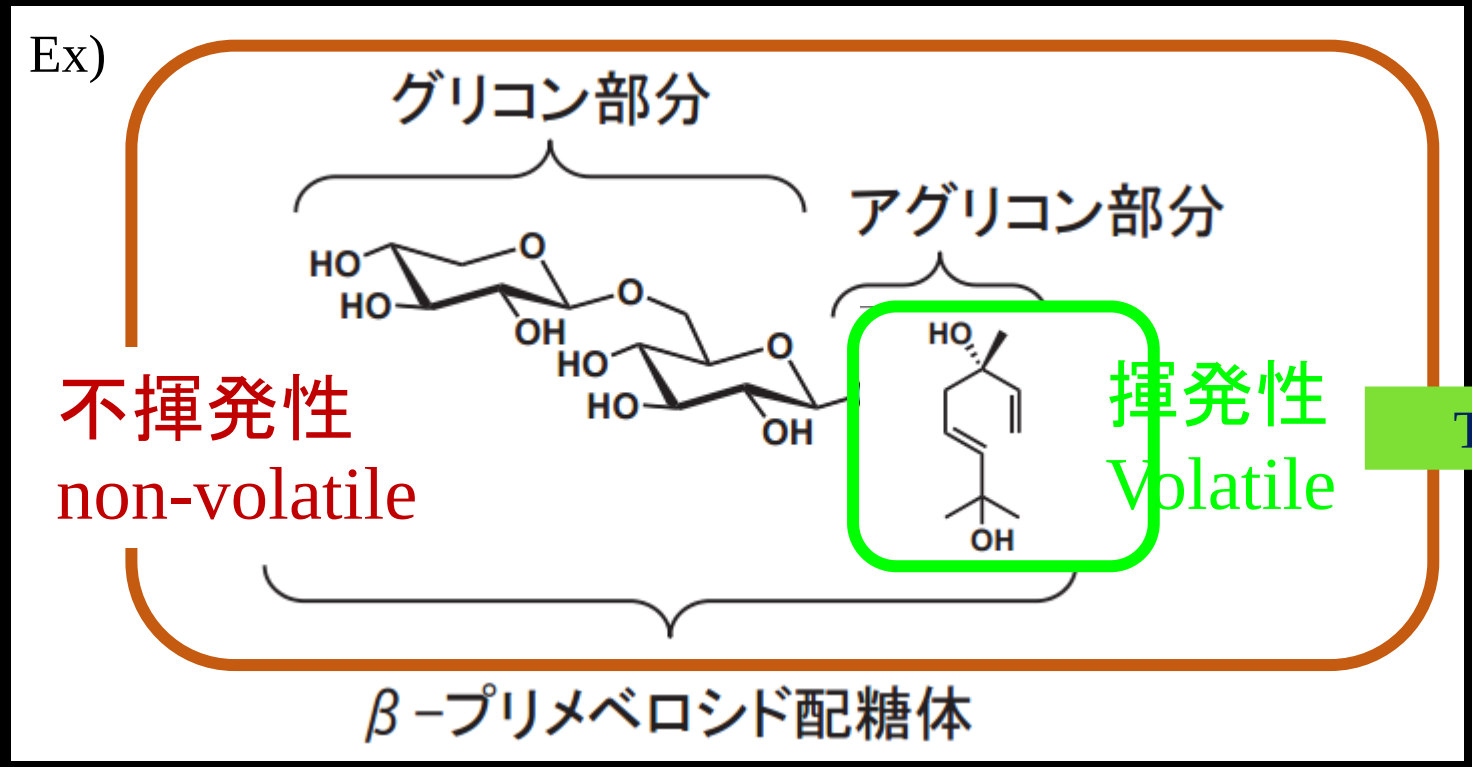

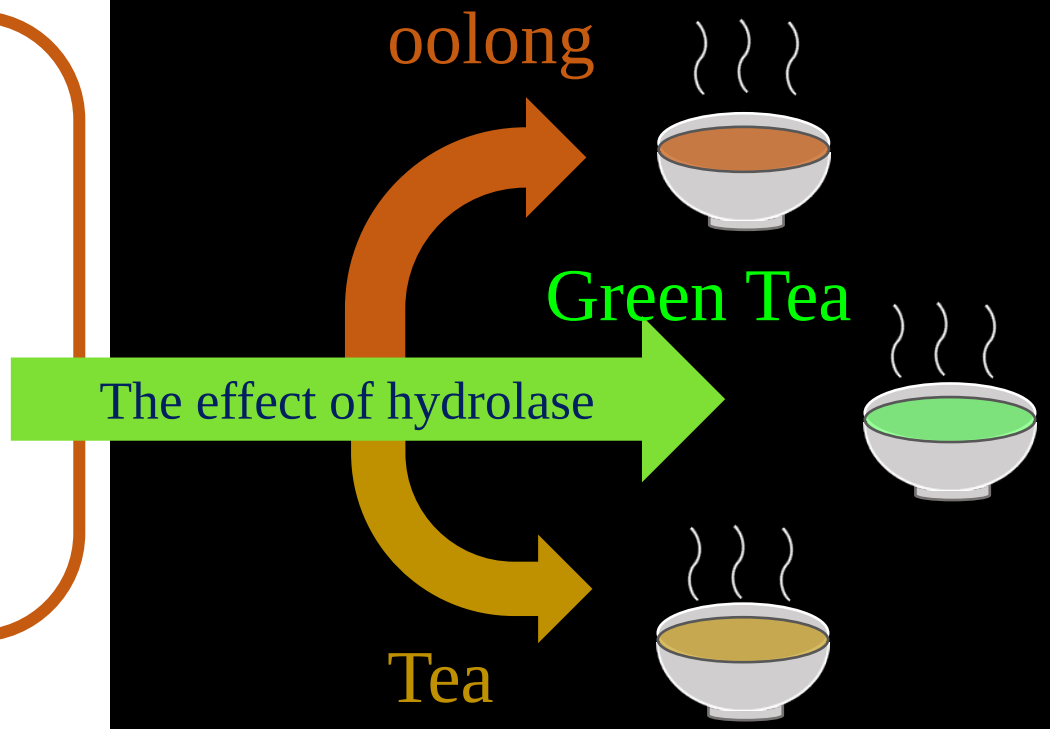

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BVOC emitted from Green Tea

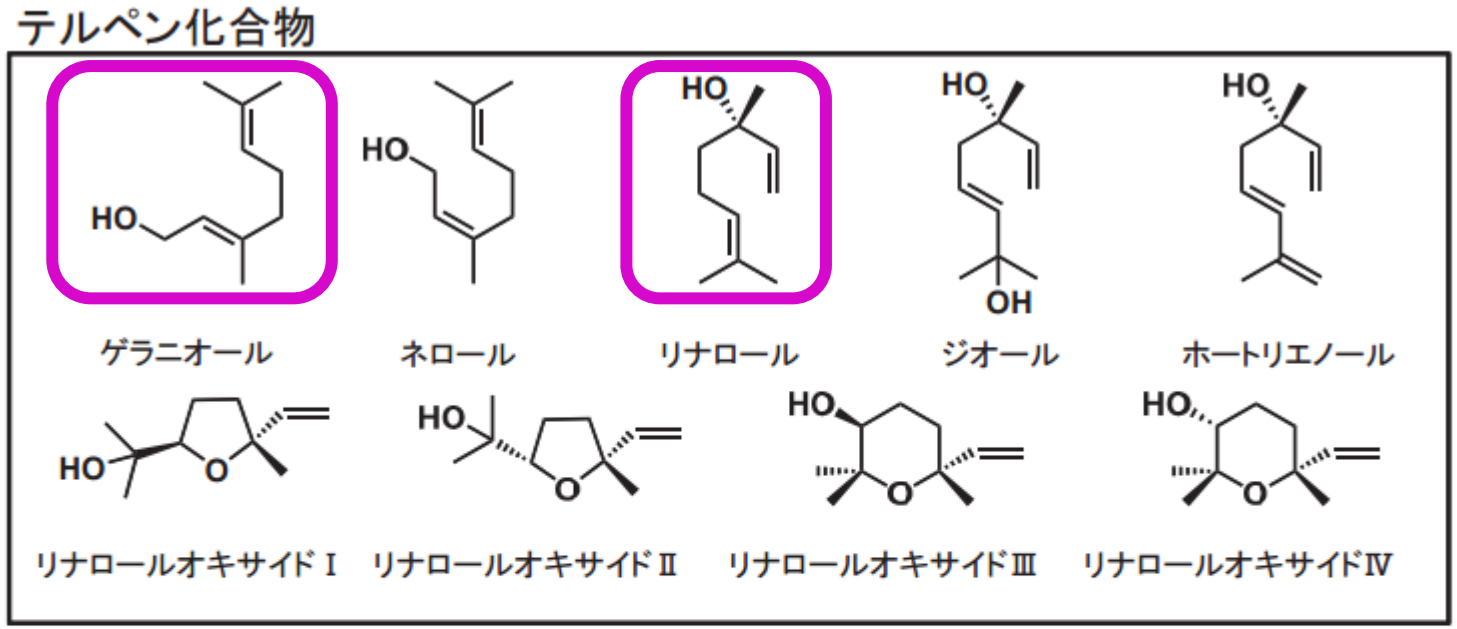


図１．チャに含まれる揮発性香気成分の化学構造

Flowry, Fruity, Sweety

smells like “Green leaf ”

Components

- Catechin
- Tannin
- Theanine (amino acid)

Components

- Catechin has…
  - antioxidative effect
  - adsorptivity
    - prevention of infection disease (ex. flu, pathogen E - Coli O - 157)
    - Anti-inflammation effect (ex. hay fever)
    - prevention of diabetes (inhibition of carbohydrase activity)

Components

- Caffeine has…
  - anti-diulatic effect
  - awakening effect (famous component in coffee)

  ★ fat combustion effect
  If you lose your weight…
  you`d better to do exercise 30 min after drinking Greeen Tea !

Components

- Theanine (ɣ-glutamil ethyl amid) is…

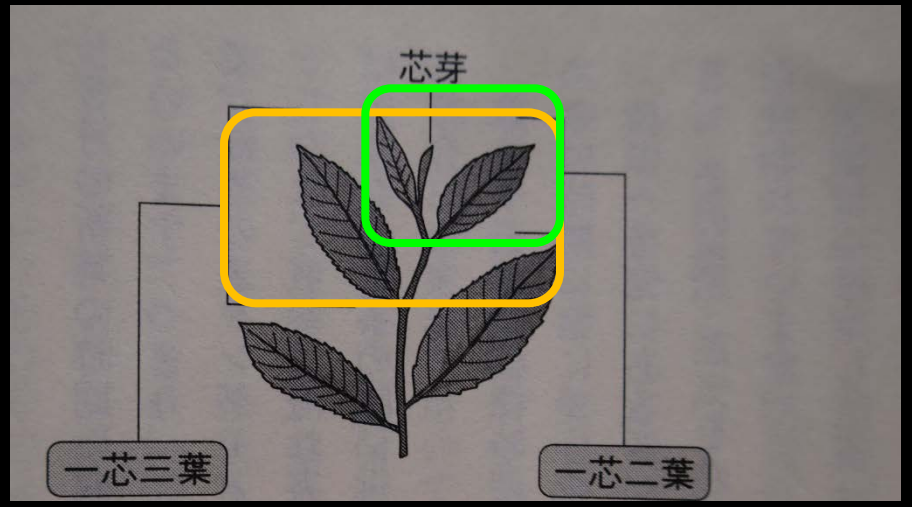
Umami

Theanine → (sunlight) → catechin

  - one of the amino acid found specifically in leaves of Tea
  - produced at root and transported to buds, leaves
  - α-wave… relaxation, prevention of high blood pressure

Kinds of Green Tea

- Sencha（煎茶）
  - most common Green Tea
  - harvested on 88th day from the first day of spring (2th May 2017)



bud at the top, first and second leaves, used for Sencha（煎茶）

bud at the top, first to third leaves, used for Gyokuro（玉露）

Kinds of Green Tea

- Gyokuro（玉露）

  luxury Green Tea known as “ The King of Green Tea ”

  ・has a large amount of amino acid including Theanine

-> sunlight is blocked 20days before harvesting leaves

-> Theanine can remain, not change to Catechin

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I think you already know Sencha（煎茶）and Gyokuro（玉露）…

but do you know Kukicha（茎茶）?

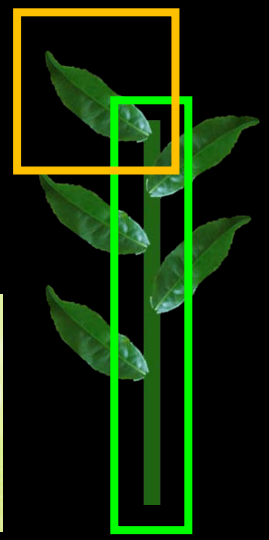
Kinds of Green Tea

- Kukicha（茎茶）

  one of the byproduct of Green Tea

  made especially in (only?) famous producing area (ex. Shizuoka)…

Sencha（煎茶）
Gyokuro（玉露）
leaf based



Kukicha（茎茶）
stalk based

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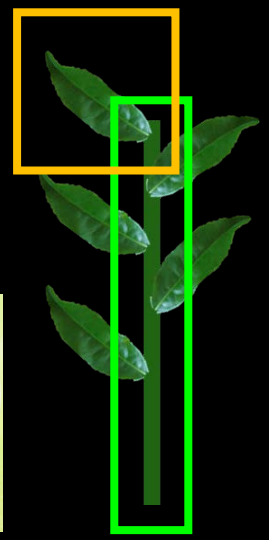


Kukicha（茎茶）

stalk based

Can you distinguish
these two types of teas by tasting ?

Comparison - components -

	煎茶　leave	茎茶 stalk
Tannin	◎	1/2
Cafeine	◎	1/2
Amino acid	1/2	◎

※ includes Theanine

- Tannin and Caffeine are biosynthesized in leaves

-> High concentration in leaves and less in stalk

-> lack of Tannin → bland in taste（茎茶）

- Theanine is biosynthesized in root and transported…

-> from roots to stalk, to leaves, the amount of Theanine gradually decreases

Comparison - flavor -

Flowry, Fruity, Sweety

smells like “Green leaf ”

	煎茶	茎茶
Linalool		◎
Nerolidol	○	
Indole	○	
Jasmone	◎	
Geraniol		○
Linalool oxide Ⅰ	○	○
Linalool oxide Ⅱ	○	○
etc...	…	…
Total amounts	◎	○

Bonus

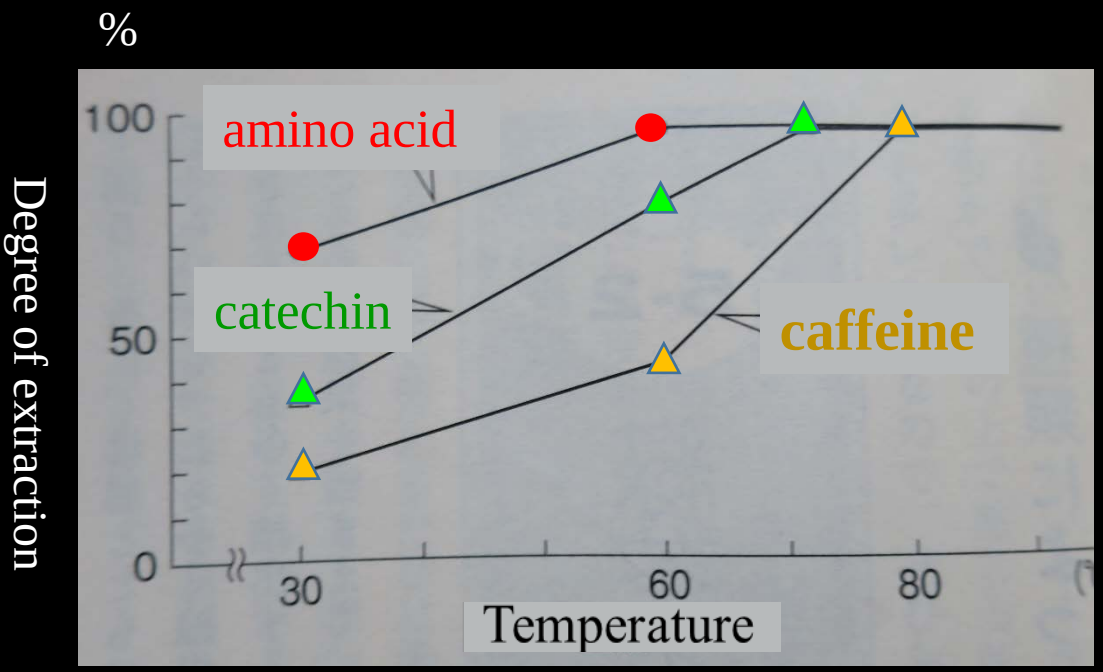
- Temperature of teas and extraction of components
  - 60℃ … Amino acids are all extracted, the others still remain.
  - 80℃ … catechin and ceffeien are all extracted.

If you want to enjoy **Umami**…

you should pour **tepid water.**

If you want to enjoy **bitter taste**…

you shoukd pour **hot water.**



参考文献

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- 茶の香気成分の貯蔵メカニズム　茶は香りをどのように繋ぎとめるのか？
- 緑茶の味と化学成分

- お茶の科学：「色・香り・味」を生み出す茶葉のひみつ / 大森正司著