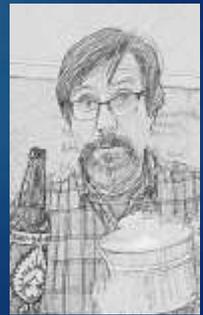


# Herbal Mixology :

Bitters, Digestives and Aperitifs  
October 19, 2017

GLEN NAGEL, ND  
HERBALIST AND MIXOLOGIST  
GLENAGEL@MSN.COM



## M.E.E.T The Herbs My herbal philosophy

- ▶ **Medicine** making is a medicine.
- ▶ **Experience** is the best teacher, make it something to remember and experience
- ▶ **Everyday** practice your craft, your art.
- ▶ **Taste** is the teacher, the new active ingredient is Taste, smell, sight.



# Herbal Mixology: The New Paradigm

- ▶ The problem with herbal medicine
- ▶ The problem with mixed drinks
- ▶ Taste is the active ingredient
- ▶ Alcohol as medicine?
- ▶ Organoleptics: the way of senses
- ▶ Herbs as medicine
- ▶ The Bitters



# Herbal Mixology Defined

- ▶ **The power of herbal phytochemicals driven into the blood stream by alcohol and wrapped in an organoleptically rich sensual experience. This is the magic and power to Herbal Mixology.**
- ▶ The art and science of adding medicinal value and action to the world of tasty alcoholic drinks
- ▶ Bringing the value of medical tonics back to the roots of botanical medicine
- ▶ My path as an herbalist, naturopathic doctor
- ▶ Making medicine is medicine, DIY



## The Problem with Herbal Medicine

- ▶ Tincture are alcoholic and water extracts sold as food extracts
- ▶ Growing industry of nutritional supplements, quality issues
- ▶ In general the problem as medicine is taste and compliance
- ▶ 90 percent of medicinal herbs taste bad to the average patient.
- ▶ Placing herbs in tablet or capsules gives less value, as the power is in the organoleptic experience.



## The Problem with Mixed Drinks or Cocktails

- ▶ Mixology history comes partially from herbal medicine and partially from pharmacy
- ▶ After the end of Prohibition there was increasing commercialization of alcohol distillation
- ▶ Increasing acceptance of mixed drinks with high alcohol content
- ▶ Increase in bars and speakeasy selling good times, and pushing high-alcohol, high-tastes drinks
- ▶ Lead to over consumption of sugar and alcohol, which lead to negative health effects.



## Medicinal Alcohol: An Oxymoron?

- ▶ Is alcohol medicinal?
- ▶ Studies about alcohol and health are mixed
- ▶ Depends on your genetic makeup, ethnic background, sex and social environment
- ▶ It is clear heavy drinking is bad for your health
- ▶ Moderate drinking has been found to be more beneficial than no drinking in some studies. Why?
- ▶ Stress, social support for having drinks?
- ▶ I believe that adding herbs to the alcohol extracts and keeping to moderation makes herbal mixology medicinal
- ▶ Limit alcohol to less to one to 2 ounces per week.



## Herbs and Alcohol

- ▶ Over 100-year history of extraction herbs into alcohol and water
- ▶ Called tinctures, extracts
- ▶ Dissolve lipophilic (alcohol-soluble constituents) compared to water extracts (teas)
- ▶ Small amount of constituents in extracts can have a profound effect because of quick absorption and movement into the blood stream
- ▶ Many common alcohols have herbs in them
  - ▶ Gin: Juniper berry
  - ▶ Absinthe: Wormwood and other botanicals
  - ▶ Ouzo: Anise



## Herbal Alcohol Extracts: Tincture

- ▶ In alcohol based herbal extracts the concentrations are expressed as weight-to-volume ratio (w:v). This refers to the dry weight extracted in the volume of solvent mixture (the menstruum).
- ▶ The weight-to-volume ratio is the amount of herb in the liquid volume and is one indication of the theoretical strength of the extract. It is only a theoretical indicator of strength as many other factors – including the quality of the raw herb and extraction method used – are also determinants.
- ▶ Tinctures are made to a concentration of 1:3, 1:4, 1:5, 1:8 or 1:10. The same amount of herb is extracted in more menstruum. Some extractions are 1:1 or 1:2, these are traditionally know as fluid extracts. Tinctures are ideal for very strong acting herbs such as *Capsicum spp.* or *Phytolacca*. Many people refer to all macerated extractions with alcohol as tinctures.

## Pros and Cons of Herbal Alcohol

### ▶ Advantages of tinctures

- ▶ Constituents efficiently extracted with minimal processing.
- ▶ The alcohol preserves the extract.
- ▶ Alcohol is a driver moves herbs into circulation.
- ▶ Readily absorbed, without digestion.
- ▶ Convenient and versatile. They can be blended to make formulations.

### ▶ Disadvantages of tinctures

- ▶ Contain alcohol. A problem for certain people for health or religious reasons.
- ▶ There can be sensitivities and it is a consideration in pregnancy and liver pancreatic or other diseases.
- ▶ Compliance issues.
- ▶ Cost issues, expensive

## Organoleptics: The Sensory Experience

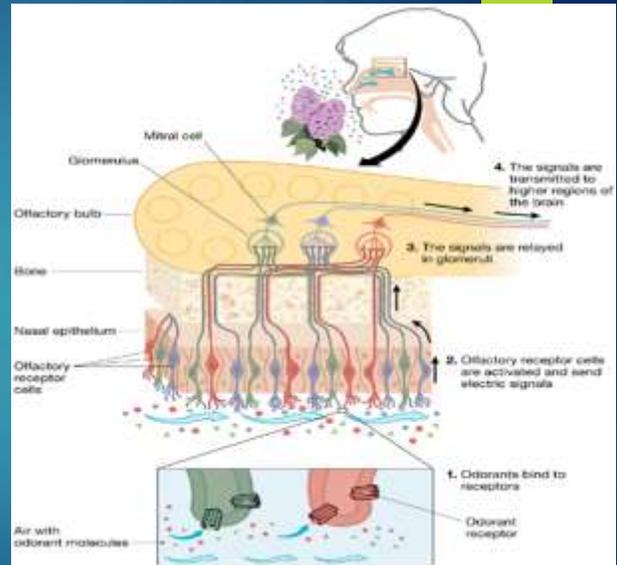
- ▶ **Organoleptics defined:** Making an impression upon an organ. Said of the effect or impression produced by any substance on the organs of touch, taste or smell, and also on the organism as a whole.



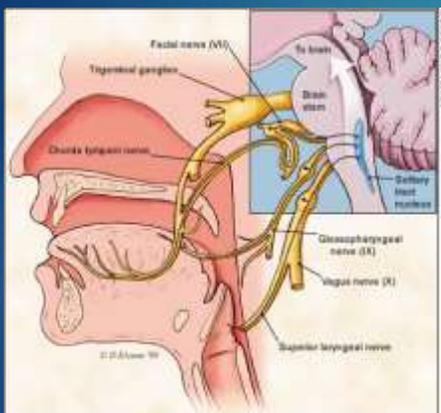
## The Powerful Influences of Scent on Body and Mind

- ▶ The sense of smell is the only one of the five senses that is directly linked to the limbic lobe of the brain. This is associated with the emotional control center and profound effect on the brain. The limbic lobe is a group of brain structures that include the hippocampus and the amygdala located below the cerebral cortex.
- ▶ The limbic lobe can also directly activate the hypothalamus which can release chemical messengers that can affect the production of growth hormones, sex hormones, thyroid hormones and neurotransmitters.
- ▶ When we inhale a scent the odor molecules travel up the nose and are trapped by the olfactory membranes in the lining of the nasal passages.

- ▶ Each odor molecule fits like a lock and key onto a specific receptor site on the olfactory epithelium. When stimulated the epithelium triggers nerve cells electrical impulses to stimulate the olfactory bulb in the brain.
- ▶ The olfactory bulb stimulates impulses to the gustatory center for taste, the amygdala where emotions and memory are stored.



## The Senses of Taste and Smell



This is why that a simple smell can effect mood, blood pressure, heart rate, breathing, memory, hormone levels and stress levels.

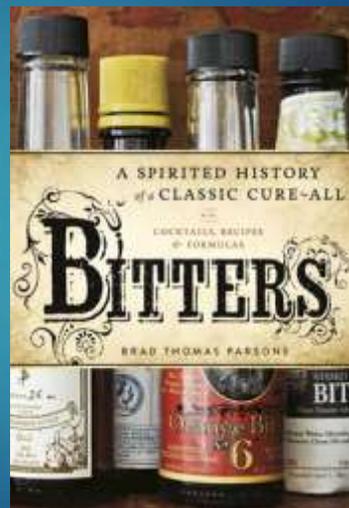
# Organoleptics and Herbal Mixology

- ▶ There is power in bringing an agent to all sensory levels
- ▶ Some of life's most powerful experience are perceived on all levels
- ▶ Touch, smell, sight, sound, taste and the sixth sense.
- ▶ Bringing this awareness to herbal mixology creates an experience through the alchemy of blending alcohol, herbs and other botanical agents. This healing organoleptic experience takes cocktails beyond a good drink.
- ▶ The power of herbal phytochemicals driven into the blood stream by alcohol and wrapped in an organoleptically rich sensual experience: This is the magic and power of Herbal Mixology.

## Herbal Bitters



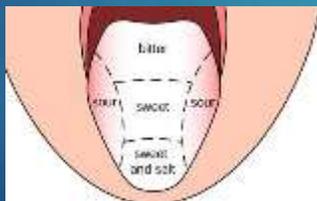
And you call this  
medicine!



# Herbal Bitters

- ▶ Any plant that tastes bitter is bitter
- ▶ Has a long historical use as medicine
- ▶ Many herbal drinks are bitter
- ▶ Many bitters are also classified as a tonic.
- ▶ You know when it is bitter!!!
- ▶ Long history in medicinal use.
- ▶ Rediscovered recently in food and medicine.

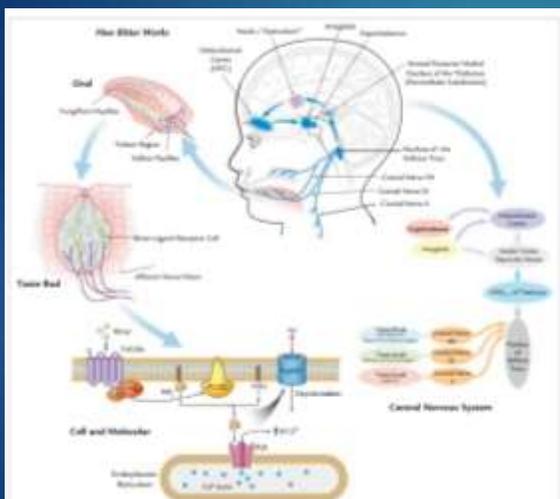
# Bitter receptors



# The Bitter Reflex and its Implications

- ▶ When a bitter substance is recognized by bitter receptors on the tongue, a chain of neural and endocrine events begins, labeled as the "bitter reflex." Mediated by the release of the gastric hormone **gastrin**, this reflex results in an overall stimulation of digestive function, which over time strengthens the structure and function of all digestive organs (liver, stomach, gallbladder, pancreas, etc.)
- ▶ Starting in your mouth, you'll notice that your salivary glands have increased their output of enzyme-rich saliva, helping to break down complex starches into smaller and more easily digested oligosaccharides.
- ▶ In the stomach, the hormone gastrin has stimulated the secretion of hydrochloric acid.
- ▶ The acidity helps break down protein, enhances the bioavailability of many minerals (especially calcium) and destroys any harmful microbes present in your food.

# How Bitter Works



- Taste buds are distributed in distinct fields in the oral, pharyngeal, and laryngeal epithelia, with each field innervated by a different cranial nerve branch.
- Only the taste buds on the tongue are depicted in the figure. The taste buds of the laryngeal epithelium are thought to be involved more with protection of the airways. Taste receptors have also been identified in a variety of nongustatory tissues, such as the gut, where they have been proposed to play a role in nutrient and toxin sensing.
- The taste signals course through the brain and provide input to circuits that subserve various functions, such as motor and physiological reflexes, discriminative perception, and affective processing.

Clinical Therapeutics/Volume 35, Number 8, 2013

# Facial Reactions to Bitter foods

*Appetite*. 2013 Dec;71:178-86. doi: 10.1016/j.appet.2013.08.013. Epub 2013 Aug 30.

## Facial affective reactions to bitter-tasting foods and body mass index in adults.

Garcia-Borras O<sup>1</sup>, Zamora MC.

### Author information

#### Abstract

Differences in food consumption among body-weight statuses (e.g., higher fruit intake linked with lower body mass index (BMI) and energy-dense products with higher BMI) has raised the question of why people who are overweight or are at risk of becoming overweight eat differently from thinner people. One explanation, in terms of sensitivity to affective properties of food, suggests that palatability-driven consumption is likely to be an important contributor to food intake, and therefore body weight. Extending this approach to unpalatable tastes, we examined the relationship between

aversive react

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and incentive

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facial reactions

**The results indicated that high BMI (body mass index) participants reacted to bitter stimuli showing more profound changes from baseline in neutral and disgust facial expressions compared with low BMI. No differences between groups were detected from the subjective pleasantness and familiarity.**

to cause 1000, apart from taste responsiveness. Can predict differences in pain.

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**KEYWORDS:** Affective facial reaction; Bitter food; Body mass index; Overweight; Taste responsiveness

## The Bitter Truth: It's Good for Us!

- ▶ The effect of bitters also extends to the pancreas. With bitters, digestive enzyme secretions are increased, helping promote the complete breakdown of nutrients into their absorbable units, preventing gas formation when large molecules are acted upon by bacteria further down the small intestine.
- ▶ The complete breakdown of proteins is particularly important, as the cross reactivity of immune cells between undigested protein molecules and intestinal cells plays an important role in the etiology of conditions such as celiac disease and allergies
- ▶ Insulin and glucagon secretions are stimulated, helping to normalize blood sugar levels.
- ▶ Our cravings for sweetness may mask cravings for bitterness.
- ▶ Thus, the taste of bitter can be used to strengthen the most fundamental aspect of our health—the ability to extract the nutrients from our foods and nourish our bodies. Over time, they will lessen symptoms of poor digestive function such as gas and bloating, constipation, loose stools and food allergies; enhance vitamin and mineral absorption; promote balanced blood sugar levels; protect the liver and strengthen eliminatory function; heal inflammatory damage to the gut wall; and reduce the incidence of allergic disorders. Wow!

## Gastrointestinal Bitters

### ▶ **True Bitters: only bitter**

- ▶ *Centaurium umbellatum*
- ▶ *Gentiana lutea*
- ▶ *Hydrastis canadensis*
- ▶ *Mahonia aquifolium*
- ▶ *Aloe* spp. Bitter Aloe (Not aloe gel but the yellow resin)
- ▶ *Eupatorium perfoliatum*
- ▶ *Menyanthes trifoliata*
- ▶ Cinchona bark
- ▶ Quassia bark

### ▶ **Aromatic Bitters: bitter with flavor**

- ▶ *Artemisia absinthium*
- ▶ *Achillea millefolium*
- ▶ *Humulus lupulus*

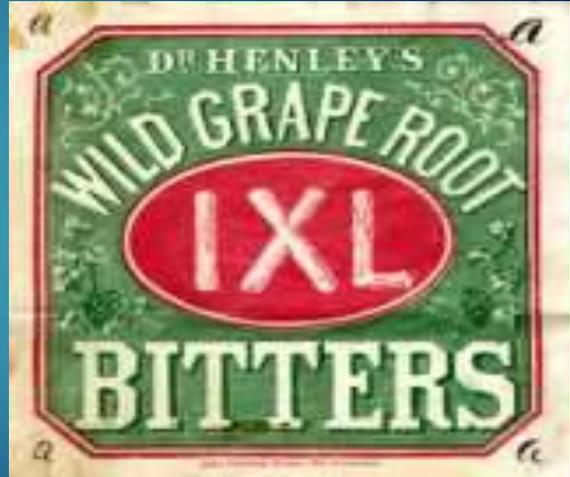


## Indications for Bitters

- ▶ Loss of appetite, low HCL
- ▶ Indigestion, bloating, gas
- ▶ Nausea, diarrhea, constipation
- ▶ Abdominal distention
- ▶ Malnutrition, malabsorption
- ▶ Weakness, pale skin with edema
- ▶ Yellow or white tongue coating
- ▶ Atonic digestion and elimination
- ▶ Depression and/or mood disorders
- ▶ Digestive issues that come with aging.

## Old Saying About Bitters

- ▶ Sweet to the taste buds, bitter to the stomach
- ▶ Bitter to the tongue, then sweet to the stomach
- ▶ Bitters are generally avoided by most patients.

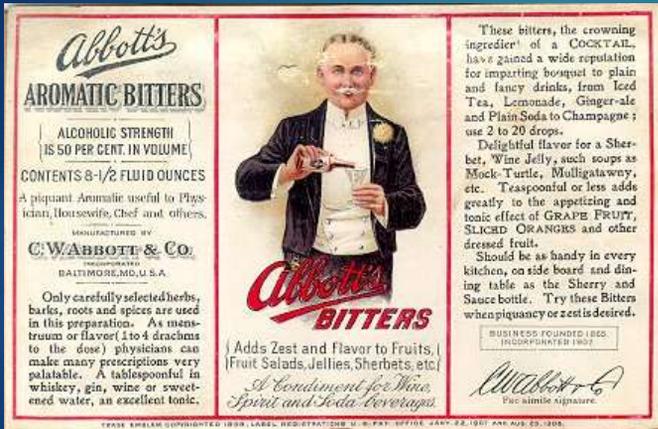


## General Contraindications for Bitters

- ▶ Pregnancy
- ▶ Kidney stones
- ▶ Gallbladder disease
- ▶ GERD
- ▶ Gastritis
- ▶ Peptic Ulcer
- ▶ Diarrhea



## Bitters in Formulation



**Abbott's**  
**AROMATIC BITTERS**

ALCOHOLIC STRENGTH  
IS 50 PER CENT. IN VOLUME

CONTENTS 8-1/2 FLUID OUNCES

A piquant Aromatic useful to Physician, Housewife, Chef and others.

MANUFACTURED BY  
**C. W. ABBOTT & CO.**  
BALTIMORE, MD., U.S.A.

Only carefully selected herbs, barks, roots and spices are used in this preparation. As menstruum or flavor (1 to 4 drachms to the dose) physicians can make many prescriptions very palatable. A tablespoonful in whiskey, gin, wine or sweetened water, an excellent tonic.

These bitters, the crowning ingredient of a COCKTAIL, have gained a wide reputation for imparting bouquet to plain and fancy drinks, from Iced Tea, Lemonade, Ginger-ale and Plain Soda to Champagne; use 2 to 20 drops.

Delightful flavor for a Sherbet, Wine Jelly, such soups as Mock Turtle, Mulligatawny, etc. Teaspoonful or less adds greatly to the appetizing and tonic effect of GRAPE FRUIT, SLICED ORANGES and other dressed fruit.

Should be as handy in every kitchen, on side board and dining table as the Sherry and Sauce bottle. Try these Bitters when piquancy or zest is desired.

ADDS ZEST AND FLAVOR TO FRUITS, FRUIT SALADS, JELLIES, SHERBETS, ETC.  
*A Condiment for Wine, Spirit and Soda Beverages.*

BUSINESS FOUNDED 1850.  
REGISTERED 1907.

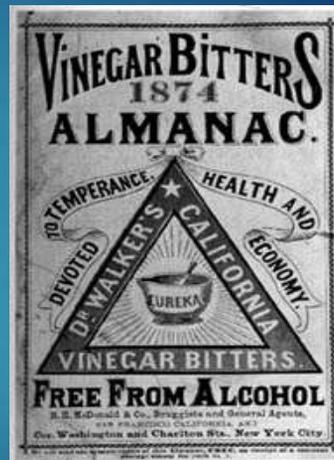
*W. Abbott & Co.*  
Fac simile signature.

TRADE MARK. COPYRIGHTED 1898. LABEL REGISTRATION U. S. PAT. OFFICE. JULY 22, 1907 AND AUG. 23, 1908.

- ▶ True bitters are commonly and historically mixed in combination with aromatic and carminative herbs
- ▶ Lessens the ability of bitters to cause bowel cramping
- ▶ Warms the formula
- ▶ Commonly used are mints, fennel, anise, calamus, ginger or aromatic bitter herbs in combinations

## Dosing Bitters

- ▶ Generally small doses
- ▶ 5-15 drops
- ▶ Before meals
- ▶ Present to the taste buds as tea or tincture
- ▶ Capsule and tablet which can not be tasted are less useful



# Take the 30-Day Bitter Challenge!

- ▶ To improve your digestion and overall health, take the 30-day bitter challenge.
- ▶ Find a bitter formula, herb or combination that has one of the true bitters.
- ▶ Take 10-30 drops of the bitter before meals, ideally 10 minutes.
- ▶ Take enough to get strong bitter sensation and "bitter shudder."
- ▶ Continue for 30 days, moving the dose up or down depending on reaction
- ▶ Assess your health before and after.



Tafel 143



Gentiana lutea L. — Gelber Enzian.



## *Gentiana lutea* (Gentian)

- ▶ **Common names:** Bitter Root, Bitterwort, Gall Weed, Gentiana, Gentianae radix, Pale Gentian, Stemless Gentian, Yellow Gentian, Wild Gentian, Qin Jiao .
- ▶ **Family:** Gentianaceae
- ▶ Listed in the USP 1820-1955, and the NF 1955-1965
- ▶ **Medicinal parts:** root and rhizome
- ▶ **Preparations:** dried root may be decocted or powdered and encapsulated. Dried or fresh root may be tinctured

## *Gentiana*

### CHEMICAL CONSTITUENTS

- ▶ *Gentiopicrotin*: a bitter principle. One of the most bitter substances known. Synonymous with *Amarogentian*. Comprises 1-2 percent of the fresh root.
- ▶ *Genistic acid* (Genistin): an organic acid
- ▶ *Tannic acid*: tiny amounts
- ▶ *Quinnic acid*: minute amounts
- ▶ Alkaloids: small amounts of *Gentianine* and *Gentialutine*
- ▶ Volatile oil
- ▶ Gentian contains very little tannin and is considered a pure peptic bitter.

# Gentiana

## ACTIONS

- ▶ Cholagogue
- ▶ Bitter tonic
- ▶ Gentian is stimulating to digestive organs, mucosal tissues, and portal circulation.

## INDICATIONS

- ▶ GI atony, poor digestion, low stomach acidity.
- ▶ Portal Congestion
- ▶ General GI debility, atony, flatulence, anorexia
- ▶ Malaria: Gentian is reported to be toxic to *Plasmodium*

## CONTRAINDICATIONS

- ▶ Avoid in cases of acute GI inflammation
- ▶ Avoid in pregnancy



# Gentiana: Specific Indications (Felter)

- ▶ Sense of epigastric depression, with physical and mental weariness
- ▶ Atony of stomach and bowels, with imperfect digestion.

**Action and Therapy.** One of the best of the simple bitter tonics. However, large doses can produce nausea, vomiting, and diarrhea, and fullness of the pulse, with headache.

- ▶ Chief use is to promote appetite and improve digestion in states of chronic debility.
- ▶ For atony of the stomach and bowels, with feeble or slow digestion, it is an ideal stimulating tonic; and after prolonged fevers and infections, when the forces of life are greatly depressed and recovery depends upon increased power to assimilate foods, gentian may be used to improve gastric digestion and thus hasten the convalescence.
- ▶ Gentian is especially useful in anorexia, in the dyspepsia of malarial origin, and in subacute gastritis and intestinal catarrh.

## Gentiana Summary

- ▶ Gentian is the quintessential bitter. It is one of the most bitter substances on the planet.
- ▶ Gentian has tonic effect on the entire constitution. It has the classic “sweet taste, followed by bitter taste” characteristic of many constitutional tonics (example: ginsengs).
- ▶ Gentians are found all over the planet. Every indigenous people has had access to a *Gentiana*.
- ▶ A true bitter can taste in a 1:30,000 dilution
- ▶ Cold nature and drying

## Quassia: *Quassia amara*

### *Quassia amara*

Formal as: *Picraena excelsa* (LINDL.)

Family: N.O. Simarubeae

- **Synonyms:** Bitter Wood. Jamaica Quassia. Bitter Ash. Quassia Amara (Linn.). Quassia Lignum, B.P.
- **Part Used:** Wood of trunks and branches.
- **Habitat:** Jamaica.
- Quassia, also known as Jamaica Quassia and Bitter Wood, is a small, shrubby tree native to the West Indies. Its species name, *amara*, is derived from the Spanish word *amargo*, which means “bitter.”
- The name fits since the bark of **the tree contains quassin, a substance 50 times more bitter than quinine**. In fact, it's the bitterest naturally-occurring chemical known to exist. Although quassia bark is an ingredient in herbal bitters in moderate amounts, the presence of this highly bitter phytochemical makes infusions made with this herb very effective natural insecticides.





## Taraxacum officinale

- ▶ **Family:** Compositae
- ▶ **Habitat:** Found throughout most of the world, particularly the Northern hemisphere
- ▶ **Collection:** The roots are best collected between June and August when they are at their most bitter. Split longitudinally before drying. The young leaves may be collected at any time, although those collected in the spring are less bitter.
- ▶ **Part Used:** Root and/or leaf
- ▶ **Taste:** Bitter, salty, sweet
- ▶ **Temperature:** Cold
- ▶ **Channels:** Liver, Gall Bladder, Spleen, Bladder



## Taraxacum officinale



- ▶ **Actions:** Diuretic (leaf), hepatorestorative, hepatoprotective, choleric, cholagogue, anti-inflammatory, anti-rheumatic, gentle laxative, alterative, anti-hypertensive, stomachic, tonic, bitter.

## *Taraxacum officinale*

- ▶ Root is for liver, leaves are for kidney
- ▶ Leaves are a potassium sparing diuretic and contain potassium. Useful in hypertension
- ▶ Root is a choloretic and cholagogue. Useful for liver and biliary problems of all kinds.



## *Taraxacum officinale*

- ▶ **Preparations & Dosage:**
- ▶ Decoction: put 1-3 tps of the root into one cup of water, decoct for 10-15 minutes.
- ▶ If using leaves, infuse rather than decoct for 10-15 minutes. This should be drunk three times a day.
- ▶ The leaves may also be eaten raw in salads or steamed as a spring green.
- ▶ Juice of the pureed leaves: sig up to 20 ml/day
- ▶ Tincture (1:5 25%): 3-10ml of the tincture up to QOD. Root and/or leaf.
- ▶ Fluid extract (1:1 30%): 2-8ml TID



*Cynara scolymus*  
(Artichoke)





## *Cynara scolymus* (Artichoke)

- ▶ Common names: Artichoke, globe artichoke, Eaten as a vegetable.
- ▶ Member of the daisy (Compositæ) family.
- ▶ Pleasantly bitter taste.
- ▶ Combines both liver and gallbladder activities, though the gallbladder predominates.

# Cynara

- ▶ Anti-toxic
- ▶ Liver tonic, restorative, stimulates bile production, relieves gas, relieves cramping, relieves nausea
  - ▶ Promotes liver cell regeneration
  - ▶ Promotes blood flow to the liver
  - ▶ Stimulates bile production (Caffeoylquinic acids, e.g. Cynarin)
- ▶ Aids in metabolism of blood lipids
- ▶ Decreases cholinesterase and fatty liver degeneration.
- ▶ Classic remedy for indigestion

# Cynara

## Chemical constituents

- ▶ Up to 2% phenolic acids, mainly 3-caffeoylquinic acid (chlorogenic acid)
- ▶ 1,5-di-O-caffeoylquinic acid (cynarin)
- ▶ caffeic acid
- ▶ 0–4% bitter sesquiterpene lactones of which 47–83% is cynaropicrin
- ▶ 0.1–1.0% flavonoids including glycosides
  - ▶ luteolin-7-b-rutinoside (scolymoside)
  - ▶ luteolin-7-b-D-glucoside
  - ▶ luteolin-4-b-D-glucoside
- ▶ Phytosterols (taraxasterol)
- ▶ Sugars
- ▶ Inulin
- ▶ Enzymes
- ▶ Volatile oil consisting mainly of sesquiterpenes
  - ▶ b-selinene
  - ▶ caryophyllene

# Cynara Pharmacology

- ▶ The choleric (bile stimulating) action of the plant has been well documented in a placebo-controlled trial involving 20 healthy volunteers. After the administration of 1.92 grams of standardized artichoke extract directly into the duodenum, liver bile flow increased by 127.3% and 151.5% at the 30- and 60-minute mark, respectively.
- ▶ Artichoke leaf may work by interfering with cholesterol synthesis. Besides cynarin, a compound in artichoke called luteolin may play a role in reducing cholesterol.
- ▶ **Medicinal actions:** Diuretic, alterative, choleric
- ▶ Lininger et al: *Healthnotes: Clinical Essentials*, Herb Monographs Prima Publishing, Rocklin, CA. 2001.
- ▶ Kraft K. Artichoke leaf extract—recent findings reflecting effects on lipid metabolism, liver and gastrointestinal tracts. *Phytotherapy*. 1997;4:369–378.

# Cynara: Clinical Use

## Gastrointestinal Conditions:

- ▶ **Constipation and indigestion:** In a study persons suffering from non-specific digestive disorders (including dyspepsia and indigestion), 320–640 mg of a standardized artichoke extract given three times a day was effective in reducing nausea, abdominal pain, constipation, and flatulence in over 70% of the study participants.
- ▶ **Fatty liver of “sluggish liver”:** Cynarin caused an increase in fecal bile acid excretion in a small study on healthy volunteers and four patients with fatty liver. Other studies support its use as a choleric.

## Dosage: *Cynara*

- ▶ Tincture for Bitter stimulation:
- ▶ Fresh or dry leaf, 1/5 40% ETOH
- ▶ Dose: 30- 60 gtts
  
- ▶ Hepatoprotective: Eat the hearts of artichoke
- ▶ Standardized extract: for Lipids
- ▶ 1800-1920 mg per day in 2 to 3 divided doses has been used
- ▶ The isolated constituent cynarin 60-1500 mg per day has also been used



## Shiso: *Perilla frutescens*



Japanese Basil

## Shiso Happy and Healthy

- ▶ Mint family
- ▶ Super easy to grow
- ▶ Unique savory flavor
- ▶ Red high in anthocyanin pigments
- ▶ Supports detoxification



## Shiso Oily

- ▶ Perilla seeds contain a drying oil (40%) with high content of multiply unsaturated fatty acids (60%  $\alpha$ -linolenic acid, 15% both linoleic and oleic acid); contains the pseudotannins and antioxidants typical for the **mint family**.
- ▶ The reddish-purple color of some cultivars is caused by an anthocyanin pigment called **perillanin chloride**.

**Table 1**

*Omega-3* content as the percentage of ALA in the seed oil (From Wikipedia, the free encyclopedia report)

Common name	Alternative name	Linnaean name	% of omega-3
Chia	chia sage	<i>Salvia hispanica</i>	64
Kiwifruit	Chinese gooseberry	<i>Actinidia chinensis</i>	62
Perilla	shiso	<i>Perilla frutescens</i>	58
Flax	linseed	<i>Linum usitatissimum</i>	55
Lingon berry	Cowberry	<i>Vaccinium vitisidaea</i>	49
Camelina	Gold-of-pleasure	<i>Camelina sativa</i>	36
Purslane	Portulaca	<i>Portulaca oleracea</i>	35
Black Raspberry		<i>Rubus occidentalis</i>	33

## Antioxidant Activities of *Perilla frutescens* against Low-Density Lipoprotein Oxidation *in Vitro* and in Human Subjects

Emi Saita, Yoshimi Kishimoto, Mariko Tani, Maki Iizuka, Miku Toyozaki, Norie Sugihara and Kazuo Kondo\*

*Institute of Environmental Science for Human Life, Ochanomizu University (2-1-1, Otsuka, Bunkyo-ku, Tokyo 112-8610, JAPAN)*

**Abstract:** Perilla (*Perilla frutescens* (L.) Britt.) is a popular food as well as a traditional medicine in Japan, China, and other Asian countries. The aim of this study was to investigate the inhibitory effects of perilla on low-density lipoprotein (LDL) oxidation *in vitro* and in human subjects. We compared the antioxidant activities of red perilla and green perilla. Both green and red perilla had high 1,1-diphenyl-2-picrylhydrazyl radical scavenging activities and were abundant in polyphenol compounds. In addition, the radical scavenging activity and polyphenol content of red perilla were higher than those of green perilla. Perilla dramatically inhibited azo-radical-induced LDL oxidation and endothelial-cell-mediated LDL oxidation *in vitro*. Moreover, red perilla significantly increased mRNA and protein expression levels of antioxidant enzymes in endothelial cells. We further examined the antioxidant effects against LDL in human subjects after the coconsumption of perilla extracts. After oral intake of red perilla, the subjects' LDL oxidation lag times were significantly longer than those before the intake. Furthermore, lipid peroxide formation and the electrophoretic mobility of LDL decreased markedly. These results suggested that perilla, especially the red variety, had high antioxidant activity and prevented the oxidation of LDL, which is a process strongly related to the development of atherosclerosis.

**Key words:** Perilla, LDL oxidation, antioxidant enzyme, atherosclerosis, endothelial cell.

## Quince: Love Apple



- ▶ Quince, *Cydonia oblonga*, is the sole member of the genus *Cydonia* in the family *Rosaceae* (which also contains apples and pears).

## History

- ▶ Pliny, who speaks at length of the medicinal virtues of the quince, says that the fruit warded off the influence of the evil eye, and other legends connect it with ancient Greek mythology, as exemplified by statues on which the fruit is represented, as well as by representations in the wall-paintings and mosaics of Pompeii, where quinces are almost always to be seen in the paws of a bear.
- ▶ By the Greeks and Romans, the quince was held sacred to Venus, who is often depicted with a quince in her right hand, the gift she received from Paris. The "golden apples" of Virgil are said to be quinces, as they were the only "golden" fruit known in his time, oranges having only been introduced into Italy at the time of the Crusades.

# History

- ▶ The fruit, being dedicated to Venus, was regarded as the symbol of love and happiness, and Plutarch mentions the bridal custom of a quince being shared by a married pair. Quinces sent as presents, or shared, were tokens of love. The custom was handed down, and throughout the Middle Ages quinces were used at every wedding feast, as we may read in a curious book, *The Praise of Musicke*:
- ▶ "I come to marriages, wherein as our ancestors did fondly and with a kind of doating, maintaine many rites and ceremonies, some whereof were either shadowes or abodements of a pleasant life to come, as the eating of a Quince Peare to be a preparative of sweet and delightful dayes between the married persons."



Review

## A review of phytochemistry and bioactivity of quince (*Cydonia oblonga* Mill.)

Maryam Khoubnasabjafari<sup>1</sup> and Abolghasem Jouyban<sup>2\*</sup>

<sup>1</sup>Tuberculosis and Lung Disease Research Center, Tabriz University of Medical Sciences, Tabriz, Iran.

<sup>2</sup>Drug Applied Research Center and Faculty of Pharmacy, Tabriz University of Medical Sciences, Tabriz, Iran.

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Phytochemicals isolated from quince (*Cydonia oblonga* Mill.) were reviewed along with their bioactivities tested on animal models and *in vitro* tests. The review covers the findings from traditional medicines of different nations to the recent investigations and consisted of 52 references.

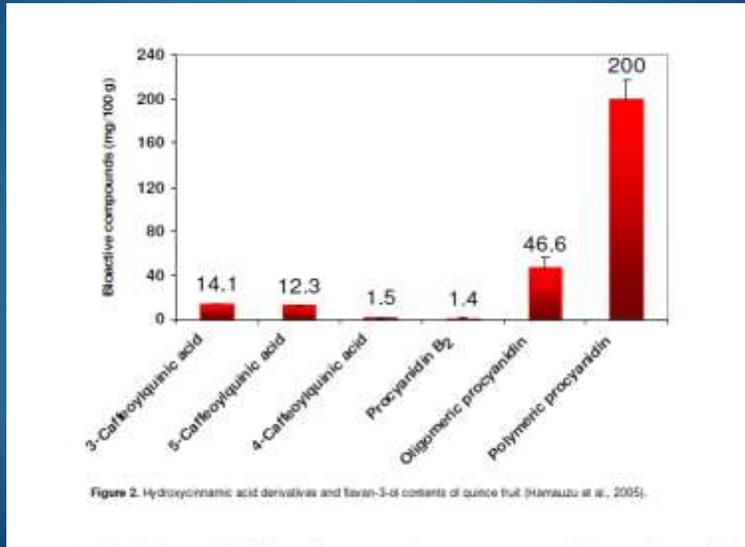
**Key words:** Phytochemicals, *Cydonia maliformis*, *Cydonia vulgaris*, *Pyrus cydonia*.

Table 1. Medicinal usages of different parts of quince

Therapeutic ailments treated	Part used	Preparation	Administration route	Reference
Antibacterial, antimutagenic, antiproliferative, anti-cancer	Fruit/Seeds	Extract	Oral	Datta et al., 2002
Anticancer	Seeds, pulp and peel	In vitro	In vitro	Benisek, 2004
Antibacterial	Seeds, pulp and peel	Extract	In vitro	Falouch et al., 2007
Antidiabetic	Fruit	Raw cooked	Oral	Tahvazi et al., 2007
Antidiabetic	Leaves	Hydro-ethanolic extract	Oral	Astan et al., 2010
Antidiabetic	Leaves	Oral	Oral	Palmasa et al., 2009
Antidiabetic	Leaves	Hydro-ethanolic extract	Oral	Astan et al., 2010
Anti-inflammatory and free radical scavenging	Leaves	Extract	In vitro	Celik et al., 2008
Anti-hyperlipidemic	Leaves	Decoction	Oral	Tarassov et al., 2001
Anti-hyperlipidemic	Leaves	Extract	Oral	Whitney, 2008
Cardiovascular, haemorrhoids, bronchial asthma and cough	Leaves	Oral	Oral	Yildirim et al., 2001
Coronary	Seeds	Decoction	Eye drop	Doddaji et al., 2002
Cough, Bronchitis, Croup/asthma	Seeds	Decoction	Oral	Ganesh et al., 2003
Cough, Bronchitis	Leaves	Decoction	Oral	Tuzlak and Tokun, 2006
Cystitis	Fruit	Cooked	Oral	Sarik et al., 2001
Dysuria	Leaves	Oral	Oral	Sarik-Kundakci et al., 2011
Diarrhea and stomach upset	Leaves and seeds	Oral	Oral	Sarik-Kundakci et al., 2011
Diarrhoea, dysentery, gastritis, colitis, leishmaniasis and kidney disease				Belkoura-Deh, 2001
Diuretic	Leaves	Decoction	Oral	Kotlar, 2007
Drug-induced myocardial necrosis	MF	MF	Oral	Sayal et al., 2010
Emollient for the skin	Fruit	Decoction	Topical	Flament et al., 2004
Headache			Oral	Gonc, 2005
Healing on skin lesions	Seeds	Mashed up added to a cream base	Topical	Giannini et al., 2010
Hemorrhoids	Leaves	Infusion	Injection	Tuzlak and Ayman, 2001
Hypertension	Leaves	Decoction	Oral	Cerna-Rodriguez et al., 2003
Inflammatory bowel disease	Fruit	Oral	Oral	Rahimi et al., 2010
Insulin production	Leaves	Decoction	Oral	Jouyban et al., 2009
Lactase	Fruit	Oral	Oral	Agarwal et al., 2005
Migrain, neuralgia, common cold and influenza	Seeds	Boiling the fruits in water	Oral	Hajeri et al., 2001
Phlebotomy, hepatitis, embolism, Menorrhagia, skin itching, haemorrhoids, diabetes, constipation, whooping cough, digestive and venereal	MF	MF	Oral	Sapgarwal (2010)
Stomach ache	Leaves	Oral	Oral	Sarik-Kundakci et al., 2011

MF, Not mentioned.

## Quince Antioxidants



## Aperitif and Digestif

- ▶ **Aperitifs** and **digestifs** are drinks, typically alcoholic, that are normally served before (aperitif) or after (digestif) a meal.
- ▶ An aperitif is an alcoholic beverage usually served before a meal to stimulate the appetite and is therefore usually dry rather than sweet. Common choices for an aperitif are vermouth champagne; pastis; gin; raki; fino, amontillado or other styles of dry sherry (but not usually cream sherry, which is very sweet and rich); and any still, dry, light white wine.
- ▶ "Aperitif" may also refer to a snack that precedes a meal. This includes an *amuse-bouche*, such as chocolate, crackers, cheese, pâté or olives.
- ▶ "Aperitif" is a French word derived from the Latin verb *aperire*, which means "to open." The French slang word for "aperitif" is "apéro."

## Recipes for Bitters

### Smoky Bitters with Oregon grape

- ▶ 8g Oregon grape bark, fresh and shredded
- ▶ 2g Oregon grape bark, dry and shredded
- ▶ 10g juniper berries, dry
- ▶ 1.5 g wormwood, fresh (1 sprig)
- ▶ 250mL single malt Scotch (Bowmore)
- ▶ 1,000mL bourbon (cheap stuff)
- ▶ 6 sticks of charred cedar planks, ~ ½" x ½" x 6"
- ▶ 50 grams of *Rehmannia* root

## NW Cynar: Artichoke Digestif

- |  |   |
|--|---|
| ▶ 20g artichoke leaves, fresh and chopped                | ▶ 9.1g fresh fennel leaves, fresh and chopped |
| ▶ 5g motherwort leaves, fresh and chopped                | ▶ 4g fresh lovage leaves, Fresh and chopped   |
| ▶ 5g wild ginger root, fresh and chopped                 | ▶ 4g fresh catnip leaves, Fresh and chopped   |
| ▶ 10g yarrow leaves, fresh and chopped                   | ▶ 3g figwort leaves, fresh and chopped        |
| ▶ 3g <i>Lomatium dissectum</i> leaves, fresh and chopped | ▶ 50 grams of black seed (Nigella seed)       |
| ▶ 6g St. Johns Wort leaves, fresh and chopped            | ▶ 750 mL 3Wishes chardonnay, 1 bottle 13%     |
| ▶ 3g juniper berries, dried                              | ▶ 300 mL Baijiu rice vodka 40% Etoh           |
| ▶ Zest of ½ grapefruit                                   | ▶ 750 mls of vodka 40 % Etoh                  |
| ▶ 5g <i>Angelica</i> fresh leaves, Fresh and chopped     | ▶ 1.5 cup of white sugar                      |

# Rapid Orange Bitters

## Adapted from Dave Arnold

- ▶ Ingredients:
- ▶ 3-4 cloves
- ▶ 2.5 green cardamom seeds removed
- ▶ 2 grams caraway seeds
- ▶ 25 gram dry orange peel
- ▶ 30 grams fresh orange peel
- ▶ 20 grams fresh lemon peel
- ▶ 25 gram fresh grapefruit peel
- ▶ 10 gram dandelion Root
- ▶ 2.4 gram goldenseal root
- ▶ 5 gram turmeric dry
- ▶ 450ml neutral vodka (Ketel)

# Rapid Orange Bitters

## Adapted from Dave Arnold

- ▶ Crack cloves, cardamom, caraway seeds, mix with all dry ingredients and place in in half-liter isi extractor.
- ▶ Charge with one whipper of NO2
- ▶ Shake for 30 seconds, leave under pressure and place in a pan of simmering hot water for 20 minutes, cool and filter, squeeze out and filter.
- ▶ Enjoy.

## Smoked Hawthorn Quince Bitters

- ▶ Chinese hawthorn
- ▶ Quince fruit
- ▶ *Gentiana* root
- ▶ Red shiso leaf
- ▶ Black currant juice concentrate
- ▶ Honey
- ▶ Vodka



## Cedar Leaf and Wood Bitters

- ▶ Red cedar Leaf
- ▶ Red cedar wood
- ▶ Juniper berries
- ▶ Wormwood leaf
- ▶ Vodka



## Resources:

- ▶ "Medicine Maker's Handbook." James Green.
- ▶ "The Compleat Anachronist #60: Alcoholic Drinks of the Middle Ages." Mark Shapiro, March 1992.
- ▶ "Making Liqueurs for Gifts." Mimi Freid, Storey Publishing Bulletin A.
- ▶ "101 Kitchen Cordials." Nancy Crosby & Sue Kenny.
- ▶ "Herbal Cookery: Herb Recipes from a Kitchen Garden" Dixie L. Stephen, Hearts & Tummies Cookbook Company
- ▶ "Bitters," by Brad Thomas Parsons.
- ▶ "A Sip through Time: A Collection of Old Brewing Recipes." Cindy Renfrow.
- ▶ "Homemade Liqueurs." Dona and Mel Meilbach.
- ▶ "Cordials from Your Kitchen." Pattie Vargas & Rich Gulling.
- ▶ "Shrubs: An old fashioned drink for modern times." Michael Dietsch