Herbal Mixology :

Bitters, Digestives and Aperitifs
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M.E.E.T The Herbs
My herbal philosophy

- **M**edicine making is a medicine.
- **E**xperience is the best teacher. Make it something to remember and experience.
- **E**veryday practice your craft, your art.
- **T**aste is the teacher, the new active ingredients are taste, smell, sight.


Smoking Kava Drink

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

- Tinctures are alcohol 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 speakeasies selling good times, and pushing high-alcohol, high-taste drinks
- This 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.
- Effects depend on your genetic makeup, ethnic background, sex and social environment.
- It is clear that 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 than 1 to 2 ounces per week.

Herbs and Alcohol

- Over 100-year history of extraction herbs into alcohol and water
- These are called tinctures or extracts.
- Alcohol dissolves lipophilic (fat-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 bloodstream.
- 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, 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 are efficiently extracted with minimal processing.
- The alcohol preserves the extract.
- Alcohol is a driver, moving 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

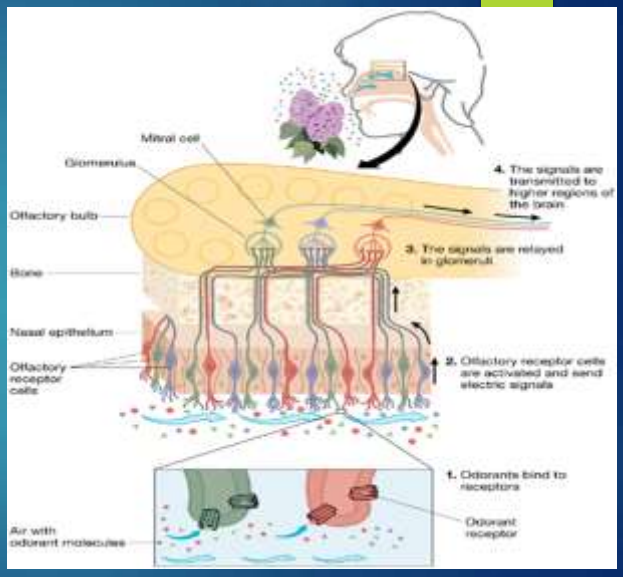
Organoleptics: The Sensory Experience

- **Organoleptics :** 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.

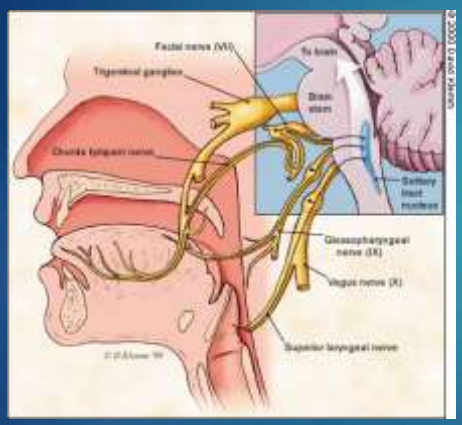
The Powerful Influences of Scent on Body and Mind

- 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 releases chemical messengers that 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 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 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 bloodstream by alcohol and wrapped in an organoleptically rich sensual experience: This is the magic and power of Herbal Mixology.

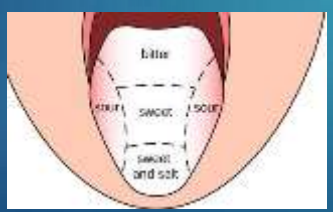
Herbal Bitters

And you call this medicine!

Herbal Bitters

- Any plant that tastes bitter is bitter.
- Bitters have a long historical use as medicine.
- Many herbal drinks are bitter.
- Many bitters are also classified tonics.
- You know when it is bitter!!!
- Bitters have been rediscovered recently in food and medicine.

Bitter receptors

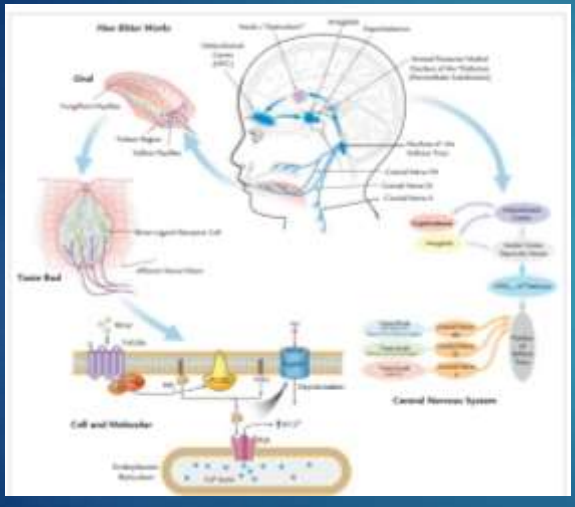


The Bitter Reflex

- 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 harmful microbes present in your food.

-- Danielle Charles-Davis, "Bitters: The Revival of a Forgotten Flavor."
https://www.westonaprice.org/health-topics/abcs-of-nutrition/bitters-revival-forgotten-flavor/

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 in the gut, where they have been proposed to play a role in nutrient and toxin sensing.
- Taste signals course through the brain and provide input to circuits that serve 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-Burgos D[1], Zamora MC

Author information

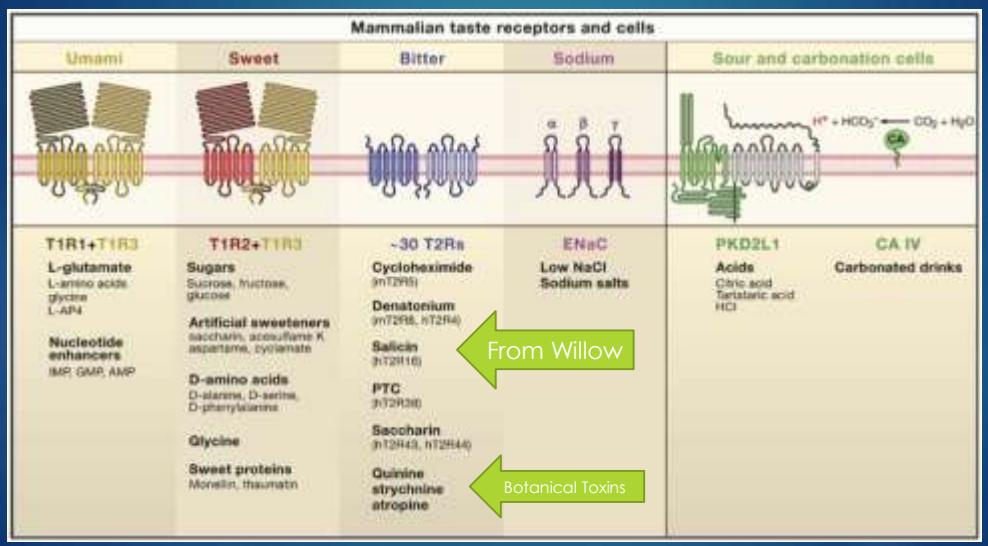
Abstract

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… tive reactions to bitter-tasting stimuli, even … ion even without conscious feelings of ple… e systems than subjective reports. Forty … D=5.8). On the basis of BMI, participants w… BMI (SD=0.7) and 25.2 for high BMI parti… cts rated the drinks' hedonic and incentive… hat high BMI participants reacted to bitt… ed with low BMI. No differences be… to examine how affective facial reactions to bitter food, apart from taste responsiveness, can predict differences in BMI.

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 fro the subjective pleasantness and familiarity.

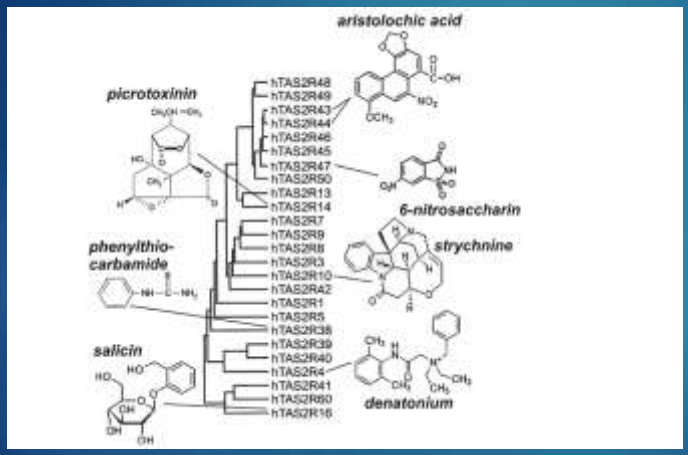
KEYWORDS: Affective facial reaction; Bitter food; Body mass index; Overweight; Taste responsiveness

Many types of Mammalian Taste Receptors



Cellular and Molecular Life Sciences 63: 1501-1509, 2006

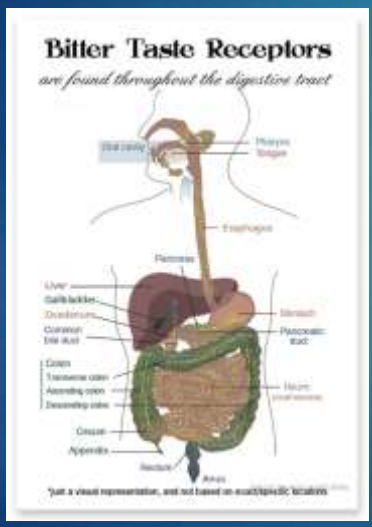
Bitter receptors



- Agonist for human bitter taste receptors are structurally diverse
- Individual bitter agents stimulate specific bitter receptors.

Cellular and Molecular Life Sciences 63: 1501-1509, 2006

Bitter receptors are found all over the body

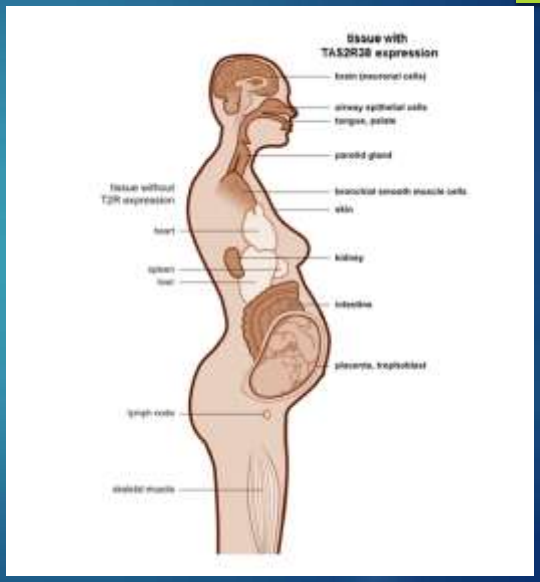


- Old thought was that bitter receptors were on the back of the tongue only.
- Now we know bitter receptors are found all over the digestive tract and beyond.
- Recent research has found them in the lungs, bronchi and in the placenta and thyroid gland.
- Bitters receptors seem to be important to humans!

F1000 Biology Reports 2011, 3:20

HUMAN TISSUE EXPRESSING TAS2R38 RECEPTORS

"Conclusion: We could show for the first time that the taste receptor TAS2R38 is expressed and functionally active in placental tissues, namely in the syncytiotrophoblast and in the amnion both of which protect the embryo. Therefore, apart from the prevention of toxic food intake, TAS2Rs might play a general role in the communication with environmental factors and the protection of the body against the environment."



Wolfle, et. al. "Expression and Functional Activity of the Human Bitter Taste receptor TAS2R38 in Human Placental Tissues and JEG-3 Cells."
Molecules 2016 March, 21(3): 306

F1000Reports BIOLOGY

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Taste isn't just for taste buds anymore

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Taken together, the findings suggest that the taste transduction cascade is not restricted to taste per se or even to systems regulating food intake. The receptors mediating taste transduction evolved early in the vertebrate lineage, and were adopted widely as a **chemodetection system** in a variety of organ systems. Questions still remain as to what the natural ligands are for many of the nongustatory functions of the "taste" transduction system

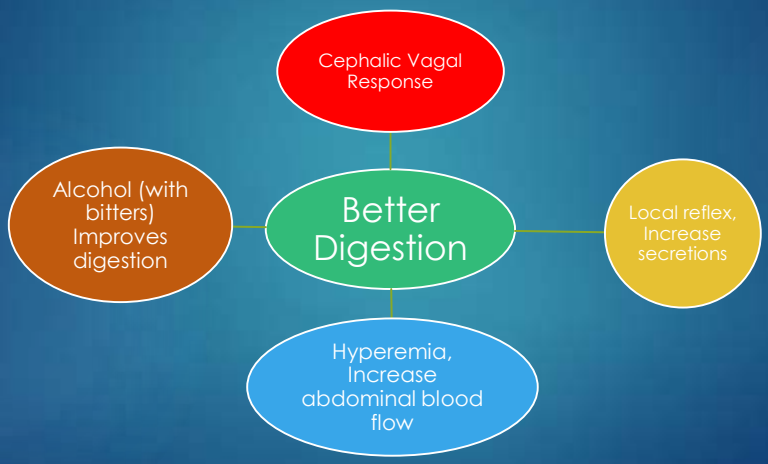
F1000 Biology Reports 2011, 3:20

The Bitter Truth: It's Good for Us!

- The effect of bitters also extends to the pancreas. Bitters increase digestive-enzyme secretions, helping promote the complete breakdown of nutrients into their absorbable units, and 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!

-- Danielle Charles-Davis, "Bitters: The Revival of a Forgotten Flavor."
https://www.westonaprice.org/health-topics/abcs-of-nutrition/bitters-revival-forgotten-flavor/

Current summary of how bitters Improve digestion



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

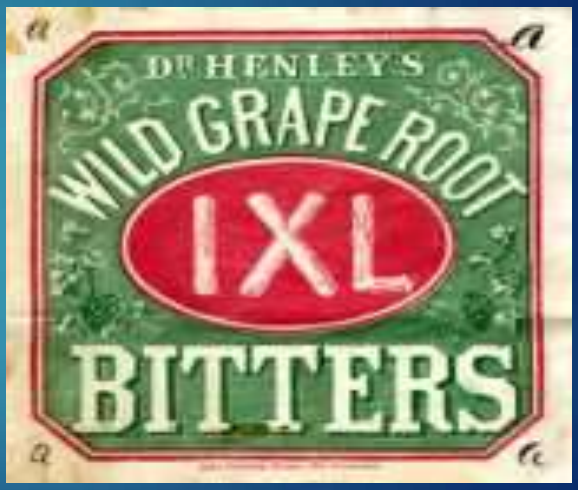
- *Artemisia absinthium*
- *Achillea millefolium*
- *Humulus lupulus*

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 accompany 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

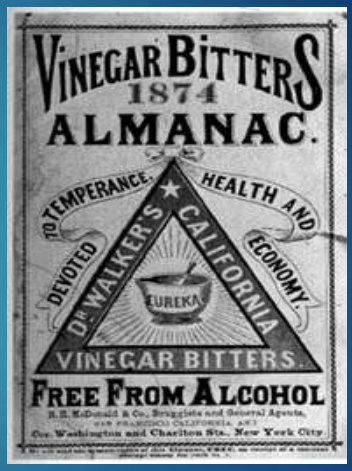
- Pregnancy
- Kidney stones
- Gallbladder disease
- GERD
- Gastritis
- Peptic ulcer
- Diarrhea

Bitters in Formulation

- 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
- Capsules and tablets 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.

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

- *Gentiopicrin:* a bitter principle. One of the most bitter substances known. Synonomous 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 be tasted in a 1:30,000 dilution.
- Cold nature and drying.

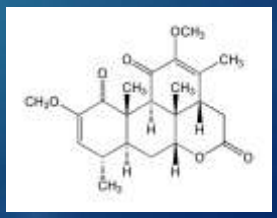
Quassia: *Quassia amara*

Formally 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.

Quassia amara: Tropical Bitter

- In the wood a share of 0.09 to 0.17% of quassin and 0.05 to 0.11% of neoquassin was detected in Costa Rican plants.
- Quassin is one of the most bitter substances found in nature.
- Other identified components of bitterwood are: beta-carbolines, beta-sitostenone, beta-sitosterol, dehydroquassins, gallic acid, gentisic acid.



Dandelion: Earth Nail

Taraxacum officinale

- **Family:** Asteraceae
- **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, gallbladder, spleen, bladder

Taraxacum officinale

- **Actions**: Diuretic (leaf), hepatorestorative, hepatoprotective, choleretic, 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 choleretic and cholagogue. Useful for liver and biliary problems of all kinds.

Taraxacum officinale

- **Preparations & Dosage**:
- Decoction: Put 1-3 tsps of the root into one cup of water, decoct for l0-l5 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%): 3-10 mL 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 (Asteraceae) family.
- Pleasantly bitter taste.
- Combines both liver and gallbladder activities, although 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 choleretic (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, choleretic
  - 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. *Phytomedicine*. 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 choleretic.

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
- 1,800 - 1,920 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

Aperitif and Digestif

- **Apéritifs** and **digestifs** are drinks, typically alcoholic, that are normally served before (apéritif) or after (digestif) a meal.
- An apéritif 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 apéritif are vermouth champagne; pastis; gin; rakı; 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.
- "Apéritif" may also refer to a snack that precedes a meal. This includes an *amuse-bouche*, such as chocolate, crackers, cheese, pâté or olives.
- "Apéritif" is a French word derived from the Latin verb *aperire*, which means "to open." The French slang word for "apéritif" is "apéro."
- Source: Wikipedia

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
- 5g motherwort leaves, fresh and chopped
- 5g wild ginger root, fresh and chopped
- 10g yarrow leaves, fresh and chopped
- 3g *Lomatium dissectum* leaves, fresh and chopped
- 6g St. Johns Wort leaves, fresh and chopped
- 3g juniper berries, dried
- Zest of ½ grapefruit
- 5g *Angelica* fresh leaves, Fresh and chopped
- 9.1g fresh fennel leaves, fresh and chopped
- 4g fresh lovage leaves, fresh and chopped
- 4g fresh catnip leaves, fresh and chopped
- 3g figwort leaves, fresh and chopped
- 50 grams of black seed (Nigella seed)
- 750 mL 3Wishes chardonnay, 1 bottle 13%
- 300 mL Baijiu rice vodka 40% EtOH
- 750 mL of vodka 40 % EtOH
- 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:

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- "Homemade Liqueurs." Dona and Mel Meilbach.
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