

Organoleptic Assessment of Medicinal Plants

The term organoleptic means 'impression on sense organs' viz. eyes, nose, tongue, ears and touch. An organoleptic study is a qualitative method where sight, smell, taste, touch and hearing are employed to describe and record the characteristic features of a plant or plant medicine. Size, shape (including internal and external colours and markings), texture, odour and taste (and oral impression) are noted. (PHCOG MAG 2006)

Organoleptic Assessment, is inclusive of the following:

- **Sight**
- **Smell**
 - Direct or retronasal aromatic olfactory sensations (IOOC 2005)
 - Qualitative retronasal sensation (IOOC 2005) cf touch
- **Taste**
 - Gustatory sensations (IOOC 2005)
 - Sweet, sour, salty, bitter, [pungent], [astringent]
- **Touch**
 - Tactile or kinaesthetic sensations (IOOC 2005) These may be digital or oral
 - Pungent, astringent
- **Sound**

Problems: objectivity, reproducibility, taste fatigue, disagreement amongst investigators

Solutions: triangulation, repetition & practise, many investigators, skilled & experience tasters with consensus vocabulary

When conducting an organoleptic assessment, consider

1. Concentration and/or hydration of material
2. Temperature of material
3. State of material (e.g. fresh, dry, fermented, rotting etc.)
4. Nature of preservative or vehicle. Glycerine, ethanol of varying percentages, oil etc. all have their own properties or may preferentially extract certain phytochemicals, which may in turn affect taste

To Assess a Plant

1. What do all its parts **look** like? Describe the plant in two modes: child-like mode and scientist-like mode. Do they remind you of anything? Are they similar to anything else?
2. **Smell** all parts of the plant. Describe. Do they remind you of anything? Similar to anything else? Do they bring up any feelings or thoughts?
3. **Taste** the plant - all parts individually and the whole plant. Determine *taste* as well as *effect* (sensation) in the mouth. Make comparisons, e.g. more bitter than..., similar to ..., but...
 - Bitter, sour, sweet, salty, astringent or pungent
 - Diffusive or permanent / flat / dull
 - Heavy or light
 - Heating, neutral or cooling
 - Moistening or drying
 - Other: meaty, metallic, oily etc. (Wood 2008)
4. **Feel** the plant and its parts. Slippery, soapy, rough, sharp, etc.?
5. **Listen** to the plant. Squeaking, crunching, crackling, popping, etc.?

Example

Organoleptic Assessment of *Agapanthus africanus*

Root

Touch: velvety exterior; crunchy; moist, but not mucilaginous.

Smell: fairly bland, like raw potato

Taste: sweet & astringent. Marked astringency. Only tiny hint of acidity.

Leaf

Touch: Smooth and cool. Mucilaginous, slimy material exudes particularly from near base.

Smell: Green; herbaceous; sweet.

Taste: Initially sweet, then a soapy bitterness develops into a mild acidity which irritates the back of the throat, particularly the fauces.

Flower

Touch: moist; soapy

Smell: faint sweet scent with green notes

Taste: initially sweet & green rapidly becoming soapy and bitter, then acrid, especially affecting soft palate and uvula, leaving a persistent dry sensation in the nasopharynx, aggravated by swallowing.

The Six 'Tastes'

[Sources: Wright; Charaka Samhita; Thirta 2004; Frawley & Lad 2004]

Sweet

[Earth + Water]

Yang, Warming, Soothing

Bland. Starch. Carbohydrate. Sugars.

Emotion: desire

Organs: pancreas (heart - cf. cordials)

Tonic. Anabolic. Nutritive. Rejuvenative. Regenerative. Moistening. Softening. Demulcent. Emollient. Soothing.

"The sweet taste (as it is of the same nature as the human body, whose tissues taste sweet), promotes the growth of all bodily tissues and *Ojas*. Aiding in longevity, it is soothing to the five sense organs and the mind, and gives strength and good complexion. Sweet taste alleviates Pitta, *Vata* and the effects of poison. It also relieves thirst and burning sensations and it promotes the health and growth of skin and hair; it is good for the voice and energy. Sweet taste is nourishing, vitalizing, gives contentment, adds bulk to the body, creates firmness. It rebuilds weakness, emaciation, and helps those damaged by disease. It is refreshing to the nose, mouth, throat, lips and tongue, and relieves fits and fainting. The favourite of insects, particularly bees and ants, sweet taste is *wet, cooling and heavy*. Yet when used too much by itself or in excess, sweet taste creates obesity, flaccidity, laziness, excessive sleep, heaviness, loss of appetite, weak digestion, abnormal growth of the muscles of the mouth and throat, difficult breathing, cough, difficult urination, intestinal torpor, fever due to cold, abdominal distension, excessive salivation, loss of feeling, loss of voice, goitre, swelling of the lymph glands, legs and neck, accumulations in the bladder and blood vessels, mucoid accretions in the throat and eyes, and other such Kapha-caused diseases" (Charaka Samhita XVI)

Sour **[Earth + Fire]** **Yin, Cooling, Refreshing**

Acid. Fermented. Vinegar.

Emotion: envy

Organs: liver

Stimulant. Improves appetite & digestion. Nourishes tissues except reproductive. Promotes circulation and metabolism. Improves senses and brain function. Balances hot & cold.

"Sour taste improves the taste of food, enkindles the digestive fire, adds bulk to the body, invigorates, awakens the mind, gives firmness to the senses, increases strength, dispels intestinal gas and flatus, gives contentment to the heart, promotes salivation, aids swallowing, moistening and digestion of food, gives nourishment. It is light, hot and wet.

"Yet when used too much by itself or in excess, sour taste makes the teeth sensitive, causes thirst, blinking of the eyes, goosebumps, liquifies *Kapha*, aggravates *Pitta* and causes a build-up of toxins in the blood. It wastes away the muscles and causes looseness of the body, creates oedema in those weak, injured or in convalescence. From its heating property it promotes the maturation and suppuration of sores, wounds, burns, fractures and other injuries. It causes a burning sensation in the throat, chest and heart." (Charaka Samhita XVI)

Salty **[Water + Fire]** **Yin, Cooling, Moistening**

Mineraline. Alkaline. Salt. Ash.

Emotion: greed

Organs: kidney

Softening. Demulcent. Retains water. Calming and sedative. Anabolic. Increases appetite and digestion. Laxative. Purgative. Emetic. Balances wet and dry.

"Salty taste promotes digestion, is moistening, enkindles digestive fire; it is cutting, biting, sharp, fluid. It works as a sedative, laxative, deobstruent. Salty taste alleviates *Vata*, relieves stiffness, contractions, softens accumulations, and nullifies all other tastes. It promotes salivation, liquifies *Kapha*, cleanses the vessels, softens all the organs of the body, gives taste to food. It is heavy, oily and hot.

"Yet when used too much by itself or in excess it aggravates *Pitta*, causes stagnation of blood, creates thirst, fainting and the sensation of burning, erosion and wasting of muscles. It aggravates infectious skin conditions, causes symptoms of poisoning, causes tumours to break open, makes the teeth fall, decreases virility, obstructs the functioning of the senses, causes wrinkling of the skin, greying and falling of the hair. Salty taste promotes bleeding diseases, hyperacidity of digestion, inflammatory skin diseases, gout and other mainly *Pitta* diseases" (Charaka Samhita XVI)

Bitter **[Air + Ether]** **Yin, Cooling, Clearing**

Coffee. Chicory.

Emotion: grief

Organs: heart, liver, gastrointestinal tract

Anti-inflammatory. Anti-pyretic. Antimicrobial. Antiseptic. Detoxifying (removes *ama*). Cleanses blood & tissues. Reduces swellings and tumours. Reduces, depletes, sedates, but in small doses stimulates, especially digestive processes. Balances hot & cold.

"Bitter taste, though it does not taste good in itself, restores the sense of taste. It is detoxifying, antibacterial, germicidal, and kills worms. It relieves fainting, burning sensation, itch, inflammatory skin conditions and thirst. Bitter taste creates tightness of the skin and

muscles. It is antipyretic, febrifuge; it enkindles digestive fire, promotes digestion of toxins, purifies lactation, helps scrape away fat and remove toxic accumulations in fat, marrow, lymph, sweat, urine, excrement, *Pitta* and *Kapha*. It is dry, cold and light.

Yet when used by itself or in excess, owing to its natural properties of dryness, roughness and clearness, it causes a wasting away of all the tissue elements of the body. Bitter taste produces roughness in the vessels, takes away strength, causes emaciation, weariness, delusion, dizziness, dryness of the mouth and other diseases of *Vata*." (Charaka Samhita XVI)

Astringent **[Earth + Air]**

Tannins. Tea.

Emotion: fear

Organs: colon, mucus membranes

Vulnerable. Styptic. Drying. Stops sweating, diarrhoea, menorrhagia, polyuria & other excess secretions and promotes fluid absorption. Constricts muscles and raises prolapses. Balances wet & dry. Balances tensions.

"Astringent taste is a sedative, stops diarrhoea, aids in healing of joints, promotes the closing and healing of sores and wounds. It is drying, firming, contracting. It alleviates *Kapha*, *Pitta* and stops bleeding. Astringent taste promotes absorption of bodily fluids; it is dry cooling and light.

Yet when used too much by itself or in excess, it causes drying of the mouth, produces pain in the heart, causes constipation, weakens the voice, obstructs channels of circulation, makes the skin dark, weakens vitality, causes premature aging. Astringent taste causes the retention of gas, urine and faeces, creates emaciation, weariness, thirst and stiffness. Owing to its natural properties of roughness, dryness and clearness, it causes *Vata*-diseases like paralysis, spasms and convulsions" (Charaka Samhita XVI)

Pungent **[Air + Fire]** **Yang, Warming, Dispersing**

Spicy. Aromatic. Acrid. Chilli.

Emotion: anger

Organs: lungs

Stimulant. Heating. Increases appetite. Improves digestion & assimilation. Expels fluids - diaphoretic, expectorant. Removes toxic accumulations (*ama*). Improves circulation. Up-regulates most bodily functions. Carminative.

"The pungent taste is cleansing to the mouth, enkindles digestive fire; purifies food, promotes nasal secretions, causes tears and gives clarity to the senses. It helps cure diseases of intestinal torpor, obesity, abdominal swelling and excessive liquid in the body. It helps discharge oily, sweaty and sticky waste products. It gives taste to food, stops itching, helps the resolution of skin growths, kills worms, is germicidal, corrodes the muscle tissues, moves blood clots and blood stagnation, breaks' up obstructions, opens the vessels, alleviates *Kapha*. It is light, hot and dry.

Yet when used too much by itself or in excess causes a weakening of virility by its post-digestive effect. By its taste and hot potency, it causes delusion, weariness, languor, emaciation. Pungent taste causes fainting, prostration, loss of consciousness and dizziness. It burns the throat, generates a burning sensation in the body, diminishes strength and causes thirst. By its predominance of fire and air, pungent taste creates various burning sensations, tremors, and piercing and stabbing pains throughout the body" (Charaka Samhita XVI)

Diffusive vs. Permanent

William Cook – Physio-Medical Dispensatory: plant medicines may be classified as *diffusives* or *permanents*. Concept came from Samuel Thomson (c 1800), although he did not use this terminology. Thatcher (1812) coined the term ‘diffusive’.

Diffusives are plant medicines that make an instant impression on the nerves and senses of the body, sometimes suddenly, like a shock, and usually cause tingling, buzzing or burning sensations in the mouth. They have a prompt, sudden, transient action. Diffusives are said to act on the vital force and remove impediments to its flow from the centre to the periphery of the body. Diffusives clear blockages in the flow of the life force, nerve force and/or the blood (Wood 1997). Many pungent plants are diffusive (e.g. *Capsicum*, as are *Zanthoxylum* spp., *Echinacea* spp. root and *Arctium lappa* seed. *Lobelia inflata* was Thomson’s great diffusive.

Plants that are not diffusive are classified as *permanent*, *flat* or *dull*. These plants are absorbed through the usual means and act more slowly, often imperceptibly, but more persistently.

Many plants will have a combination of these actions or different plant parts will have different actions (e.g. *Arctium* semen vs. radix)

Oneirogenic Experimentation

The oneirogenic (“dream inducing”) effects of a plant can be used to assess its medicinal potential. Ingesting the plant and determining its effects on the dreams of the experimenter can give insights into the inner nature of the plant and its potential medicine. Some plants such as *St John’s Wort*, *Mugwort* and *Salvia divinorum* are well known for their effects on dreams and can potentially be used to assist the researcher to study other medicinal plants.

Basic Dream Proving Protocol

1. Single or multiple subjects
2. Intra-individual controls, placebo control, double or single blind designs are all possible
3. Develop a baseline for the researcher – subject must record dreams for a period of time before commencing experimentation with the substance e.g. one week
4. Dream journal is kept, making observations for pre-experiment and experimental periods
5. Substance under study is ingested, inhaled or applied to the body before bedtime OR a quantity of the substance can be kept with the subject throughout the night
6. Dream content as well as sensations, feelings, impressions that occur in the dream or the subject associates with the dream in waking state should be recorded
7. Significant pre- and post- sleep experiences should also be recorded
8. Experimental period may be one occasion or repeated on consecutive nights, either leaving first dose to act (homeopathic preparation) or taking subsequent doses on subsequent nights (herbal preparation)
9. Qualitative research techniques of inductive thematic analysis may be used to analyse journal data for trends and themes. Post exposure dreams are compared to the pre-exposure control dreams. This will give an insight into the nature of the medicine of the plant under study.

Another experimental technique involves using plants with known oneirogenic qualities as guides or assistants in study other plants. This method could involve taking a well-known dream inducing plant such as *Hypericum perforatum*, *Artemisia vulgaris*, *Salvia divinorum* or

Silene capensis for a period of time, in order to induce more active dreams, while familiarising the dreamer with dreams that relate to this plant. The researcher could then add the plant to be investigated to the carrier plant and the resultant dreams could be analysed.

Dietary supplements may be used to help prepare ground for dream development, prolong dreams and help the experimenter to recall them:

Tryptophan, methionine, serine, choline, 5-HTP, melatonin and Vitamins B1, B3, B5, B6, B12 & Folic acid

Attention should also be paid to dreams that contain a known plant – the content and feelings of this dream may carefully be evaluated to see if they throw any light on the nature of that particular plant's medicine.

Reference: Toro, G. & Thomas, B. (2007). *Drugs of the Dreaming*. Park Street Press: Rochester