

An Introduction to Ayurvedic Pharmacology

by Todd Caldecott

The branch of traditional Indian knowledge that is concerned with health and disease, the qualities (*guna*) of food and medicine (*dravya*) and their activities (*karma*) upon the human physiology, is ayurveda. The term ayurveda comes from the Sanskrit words *ayus*, meaning “life,” and *vedas*, which translates as “divine knowledge.” Ayurveda is derived from the four principle *vedas*: the *Rig Veda*, *Yajur Veda*, *Sama Veda* and the *Atharva Veda*. The *vedas* are considered to be a vast storehouse of sacred and transcendent knowledge, and ayurveda is a *shastra* (teaching) within the *vedas* that directly relates to health and disease. This *shastra* is compiled into *samhitas* (“collected sayings”), and although there are several extant works of ayurveda, two texts, one compiled by *Susruta* and the other by *Charaka*, are considered to be authoritative. While the date of these texts is a subject of some controversy, the bulk of academic opinion places their date of authorship to be pre-Buddhist, prior to the 5th century BCE. The *Charaka Samhita* in its present form is unlikely to represent the original work, which is said to have originated from the teachings of *Bharadvaja*, the first human proponent of ayurveda during this period. Whereas the *Charaka Samhita* is wholly concerned with internal medicine (*kaya chikitsa*), the *Susruta Samhita* is first and foremost a technical manual of the surgical practices of ayurveda, surprisingly devoid of the magico-religious practices that one might attribute to an ancient and “primitive” people. This latter text seems to provide little in the way of innovation and appears to be representative of contemporary practices, and as Dr. Krishnamurthy opines in his *Wealth of Susruta*, must have had a long period of development before coming to this level of fruition. The modern practice of rhinoplasty, for example, was described by *Susruta* as a prosaic surgical technique over 2000 years ago.

Of the many important concepts that ayurveda has to share, the *gurvadi gunas*, or the “Ten Pairs of Opposite Qualities,” certainly ranks as among the most important. These ten pairs, although by no means a compre-

hensive list of potential qualities (*guna*), cover an enormously large degree of possibilities. The Ten Pairs of Opposites are as follows:

Ten Pairs of Opposite Qualities	
Heavy	Light
Slow	Fast
Cold	Hot
Oily	Dry
Sticky	Brittle
Solid	Fluid
Soft	Hard
Stable	Mobile
Subtle	Gross
Frictional	Slimy

It is these qualitative possibilities, organized into patterns of interaction, that are found by observing the human body, and that give rise to the concept of *tridosha*¹, viz. *vata*, *pitta* and *kapha*.

Vata is the catalyst for all functional changes that occur in the body, and as such, ayurveda considers *pitta* and *kapha* ‘lame’ without *vata*’s involvement. The term ‘*vata*’ is derived from the Sanskrit root word ‘*va*’, meaning ‘to go’. It is the most powerful of the *doshas*, residing principally in the large intestine and urinary bladder, and has a downward-moving energy. According to the vedic concept of *agni-saumiya* (‘solar-lunar’, roughly synonymous with the TCM concept of yang and yin respectively), *vata* is neutral in energy, and can be disturbed by extremes of either hot or cold. However, as ayurveda considers the nature of the human body to be cold, *vata* more often promotes this quality. Referring to the *gurvadi gunas* listed above, *vata*’s primary qualities are light, fast, cold, dry, brittle, hard, mobile, subtle and frictional. Pathologically, *vata* might be noticed in the body by asthenia (light), mental lability (fast), anorexia (cold), mucosal deficiency (dry), weakness (brittle), constipation (hard), migrating body pain (mobile), hypersensitivities (subtle) and arthritis (frictional). In some individuals complaints such as these are constitutional tendencies (*prakriti*), and thus measures are taken on a daily and seasonal basis to limit the effects of *vata*.

Pitta’s function in the body is to provide heat, to provide the act of ‘cooking’, and thus is responsible for catabolic processes such as digestion. The term *Pitta* is

derived from the root word 'tapa' which refers to the properties of 'heat'; the development of *tapas* results in the 'inner heat' of spiritual awareness. *Pitta* is the principle of *agni* (lit. the 'God of Fire') in the body, residing principally in the organs of digestion from the lower fundus of the stomach to the terminal end of the small intestine, having a sideways-moving energy. *Pitta's* primary qualities are light, fast, hot, oily, fluid, and soft. Pathologically, *pitta* might be seen in the body as the excessive secretion of bile (light, promoting peristalsis and flatulence), impatience and irritability (fast), hyperacidity (hot), excessive sweat (oily) and diarrhea (fluid and soft). In some individuals these complaints are constitutional tendencies, and thus measures are taken on a daily and seasonal basis to limit the effects of *pitta*.

In many ways *kapha* is opposite in nature to *pitta*, and is representative of *soma* (the lunar aspect) maintaining the structural functions of the body by lubricating, moisturizing, nourishing and providing support. *Kapha* is derived from the root word 'shlish' which means 'to embrace', referring to its overall function of cohesion and integration. *Kapha* resides in the heart and lungs and has an upward-moving energy. Its primary qualities are heavy, slow, cold, oily, sticky, solid, stable, gross and slippery. Pathologically, *kapha* might be noticed as obesity (heavy), laziness (slow), sluggish appetite and poor digestion (cold), oily skin (oily), mucus congestion (sticky), tumor (solid), stubbornness (stable), weight gain (gross) and emotional smothering (slimy). In some individuals these complaints are constitutional tendencies, and thus measures are taken on a daily and seasonal basis to limit the effects of *kapha*.

Within the body, any of the doshas can undergo three basic stages of change. Increase (*chaya*) refers to the aggravation of a *dosha* within its respective sphere of influence, whereas vitiation (*kopa*) refers to that same *dosha* beginning to affect the other doshas or functions normally outside its direct sphere of influence. *Doshas* that are not responsible for any pathological changes are normal (*sama*).

Dravyguna (Pharmacology): Definition, Scope and Background

Dravyguna is the limb of ayurveda that concerns itself with the properties and actions (*guna*) of medicinal agents (*dravya*).² The first branch of *dravyguna* is *namarupavijnana*, a system (*vijnana*)

of mnemonics detailing the various synonyms that describe specific characteristics of a given medicament. These different names (*nama*) usually refer to morphological characteristics (*rupa*), but *nama* might also refer to a medicinal use or another unique characteristic. An example is the variance in synonyms of turmeric root (*Curcuma longa*), including haridra (referring to its natural yellow dye), varna (indicating its usefulness in skin disorders) and nisha (which explains that the root is best harvested at night, preferably under the light of a full moon). The second branch of *dravyguna* concerns itself with explaining the properties (*guna*) and actions (*karma*) of medicaments, something that modern science might understand as pharmacology, and is known as *gunakarmavijnana*. Building upon *gunakarmavijnana*, the third branch of *dravyguna* is *prayogavijnana*, describing the therapeutic indications of specific medicines, as well as pharmacy. The fourth and last aspect of *dravyguna* is *bhesa-jakalpana*, referring to the collection and storage of drugs and various methods of processing.

What is a Dravya?

A substance only becomes a *dravya* when its specific qualities (*guna*) are taken into consideration, and thus a *dravya* is dependent upon the purpose (*artha*) and rationale (*yukti*) of its usage. When viewed as a singular phenomenon, a *dravya* has no inherent quality: it is the perceptive process, viz. the five senses and the mental impressions that are formed, which give rise to *guna*. Ayurveda designates a *dravya* as strictly *panchabautika* or 'formed of the elements', and is devoid of *atma* (consciousness) and therefore insentient (Sharma, 9). It is the conscious usage of a substance that makes a *dravya*.

Dravyas are grouped in several ways depending upon the source within the extant literature of ayurveda, but both *Susruta* and *Charaka* group *dravyas* according to therapeutic action. *Charaka* enumerates fifty groups, each group containing ten herbs named according to the general action of that group, such as analgesics (*vedanasthapana*), diuretics (*mutravirechana*), and anthelmintics (*krimighna*). *Susruta* categorizes each therapeutic group with the name of a notable representative of that group, an example being the *pippalyadi* group, the suffix 'adi' meaning 'etc.', with the herb *Pippali* (*Piper longum*) being representative. *Susruta* also provides therapeutic indications for each of these groups, the *dravyas* within

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Todd Caldecott

Todd Caldecott, CI.H., AHG blends his training as a Western Clinical Herbalist with Ayurvedic medicine, and has been a professional member of the American Herbalists Guild since 1997. He received his diploma in Clinical herbal medicine in 1997 from the Coastal Mountain College of Healing Arts in Vancouver, B.C. His training in Ayurvedic medicine began with Dr. T. Sukumaran at the Centre for Ayurvedic Studies in Vancouver, B.C., and continued in India at the Arya Vaidya Chikitsalayam (Hospital) under the direction of Sri Vasudevan and Dr. Hari. Todd currently practices in Calgary, Alberta at the Wild Rose Clinic, and is an instructor at the Wild Rose College of Natural Healing. Todd also spends a fair amount of his time in the temperate rainforests of the West Kootenays of British Columbia looking for medicinal plants and conducting harvesting field trials for the Harrop-Procter Community Co-operative (HPCC). The HPCC is the first such community organization in Canada licenced by government to harvest forest products according to the ecological principles of the Silva Forest Foundation.

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the *pippalyadi* group for example are indicated in *vata* and *kapha* disorders, respiratory ailments, anorexia, poor digestion, flatulence and tumors (Sharma, 13-22).

Other methods of *dravya* classification include whether its activity decreases (*doshaprasamana*), increases (*doshapradusana*), or balances (*swasthahita*) a specific *dosha*, or whether the *dravya* can be used to pacify an aggravated *dosha* (*samshamana*) or to expel an aggravated *dosha* by means of purificatory methods (*shodhana*) (Sharma, 11-12).

Rasa: The Six Tastes

The simplest method by which a *dravya* can be analyzed is with the tongue, noticing specific oral sensations, called *rasa*. In itself *rasa* does not provide any definite information but gives possible indications of a medicament's composition, character, property and pharmacological effect. There are six *rasas* in ayurveda, each displaying a certain combination of qualities (*gunas*):

1. *Sweet* is oily, followed by cold and then heavy;
2. *Sour* is oily, followed by hot and then light;
3. *Salty* is oily, followed by hot and then heavy;
4. *Pungent* is dry, followed by hot and then light;
5. *Bitter* is dry, followed by cold and then light;
6. *Astringent* is dry, followed by cold and then heavy.

Rasas that are tasted secondarily are termed *anurasas* (*anu* = 'secondary'), and although they add to the overall activity of the *dravya*, they are weaker than the primary *rasa(s)*. The classification of *rasa* is not a static designation and changes that occur to the *dravya* over time, including processing and storage, may alter the original *rasa*. An ethanol extract for example will most likely add pungent *rasa* to the original *rasa* of the crude *dravya*.

Dravyas, or foods with a predominance of a sweet *rasa*, increase heaviness, coldness, and oiliness, thereby increasing *kapha* while decreasing *vata* and *pitta*. Sweet *dravyas* are often the first choice when treating *pitta* or *vata*, although *vatic* treatments may require the inclusion of a *rasa* that contains hot to counterbalance the cold nature of sweet. Examples of *sweet dravyas* include the mucilaginous herbs such as marshmallow root (*Althea officinalis*) and slippery elm bark (*Ulmus fulva*), and include most nourishing foods, such as whole grains, fruit, and animal products.

As *sour rasa* displays the properties of oily, hot and

light, it will typically increase *pitta* and decrease *kapha* and *vata*. If used to excess, however, *sour* may also increase *kapha* because of its oily nature. *Sour* is best for stimulating digestion and relieving the dryness of *vata* (Tarabilda, 64), an example being its utility to stimulate the appetite in patients receiving chemotherapy, whose throats are often dry and parched.³ Examples of *sour dravyas* include shan zha fruit (*Crataegus pinnatifida*) and rosehips (*Rosa spp.*), as well as fermented foods and beverages.

Salty rasa typically displays a hot, oily and heavy nature, increasing *pitta*, decreasing *vata* and promoting the vitiation and liquefaction of *kapha*. Certain kinds of *salty dravyas* like rock salt (*saindhava*) possess a cooling *virya* (energy), and thus because *salty* is also heavy it can be used to correct *pitta*. *Salty dravyas* are often used to correct *vata* as all of its characteristics seem to counter *vata's* basic nature. In *vatic* conditions where there is weak digestion (*mandagni*), however, *salty rasa* is a poor choice to correct *vata* because *salt's* heaviness may further digestive weakness. Examples of *salty dravyas* include herbs such as kelp (*Fucus vesiculosus*) and nettle leaf (*Urtica dioica*), and foods such as celery and ocean fish, as well as the sodium chloride that is found naturally in and added to the diet. In a broader context, *salty* refers to the most prominent of the electrolytes, including potassium and chloride, as well as sodium.

Pungent rasa contains the qualities of hot, dry, and light, and among the *rasas* most resembles the quality of the digestive fire (*agni*). Pungent typically vitiates *pitta*, increases *vata* and decreases *kapha*. If used in small amounts and balanced with *rasas* that have an oily and heavy nature (e.g. *ghee*), pungent may be used in *vatic* conditions with caution. Examples of *pungent dravyas* include herbs such as cayenne fruit (*Capsicum minimum*) and black pepper fruit (*Piper nigrum*), and foods such as tomatoes and peppers, and distilled alcohol.

Bitter rasa arises from the combined qualities of dry, light and cold, decreasing *pitta* and *kapha*, and vitiating *vata*, the *dosha* that bitter most resembles. If used to excess or in an inappropriate fashion however, bitter may also increase *pitta* because of its light quality. Even though *bitter rasa* is used to decrease *kapha* because of its catabolic quality, it is often wise to include *pungent rasa* in treatment to compensate for bitter's cold nature. *Vatic* conditions will often benefit from *bitter rasa* to assist in the removal of

In itself *rasa* does not provide any definite information but gives possible indications of a medicament's composition, character, property and pharmacological effect.

toxins (*ama*) which facilitate its vitiation, but this approach needs to be balanced with *rasas* such as *sour* and *sweet*. Examples of *bitter dravyas* include herbs such as gentian root (*Gentiana luteum*) and goldenseal root (*Hydrastis canadensis*), and vegetables such as endive, bitter melon, and purple turnip.

Astringent rasa is comprised of dry, cold, and heavy qualities, used primarily to decrease *kapha* and *pitta*, and promote the firmness and tone of the tissues. *Astringent rasa*, although heavy, is exceptionally dry in nature and will increase *vata*. If used to excess, the drying quality of *astringent* may also increase *pitta*, wasting the tissues to promote lightness. Examples of *astringent dravyas* include herbs such as alum root (*Heuchera cylindrica*) and bearberry leaf (*Arctostaphylos uva-ursi*), and beverages such as black tea.

Vipaka: Post-digestive effect

Vipaka is a controversial subject in some respects because the process it claims to describe cannot be observed but only inferred. *Vipaka* is the process by which the *rasa* of an ingested *dravya* is modified by the differing activities of the digestive process. When a substance is ingested, digestion begins in the mouth (*sweet* and *salty*), followed by secretions of the stomach (*pungent*), small intestine (*sour*) and liver (*bitter*), and ending with fermentation (*pungent*) and the absorption of water (*astringent*) in the colon. Thus, *vipaka* can describe where in the gastrointestinal tract the *rasa* of a given *dravya* will exert its activity, and how it might affect the state of the *doshas* that reside in their respective locations of the gastrointestinal tract.

The *Susruta* and *Charaka Samhitas* differ in some respects in describing *vipaka*. According to *Susruta*, *vipaka* is only of two types: heavy (anabolic) or light (catabolic). *Charaka* however details three *vipakas* based on the *rasas*: *sweet*, *sour* and *pungent*. The reason for this difference is understandable if it is remembered that *Susruta* was a surgeon and thus his classification is based upon the nature of the tissues (*dhatu*s) of the body, whether a *dravya* is anabolic or catabolic. *Charaka's* method, developed by a specialist of internal medicine, is based on the three *doshas* of *kapha*, *pitta* and *vata*, and the digested *rasas* that represent them. The following details the differences between them:

- **According to *Susruta***

- a heavy *vipaka* will increase *kapha* and decrease *pitta* and *Vata*,
- a light *vipaka* will increase *pitta* and *vata*, but decrease *kapha*;

- **According to *Charaka***

- a sweet *vipaka* will increase *kapha* and decrease *pitta*,
- a sour *vipaka* will tend to aggravate *pitta* but pacify *vata*,
- a pungent *vipaka* will increase *vata* and decrease *kapha*.

A heavy *vipaka* is the result of *sweet* and *salty rasas*, whereas a *light vipaka* is the result of the remaining four *rasas*, viz. *sour*, *pungent*, *bitter* and *astringent*. A *sweet vipaka* is the result of *sweet* and *salty rasas*, a *sour vipaka* from a *sour rasa*, and a *pungent vipaka* from a *pungent*, *bitter* or *astringent rasa*. While most *dravyas* adhere to this scheme, some do not. The *rasa* of *bibhitaki* (*Terminalia bellerica*) for example, is primarily *astringent*, but the *vipaka* is *sweet*. This type of exception exists for many of the more important *dravyas* used in ayurvedic medicine.

The significant differences between *rasa* and *vipaka* relate to their effects: *rasa* has an immediate, localized effect on the gastrointestinal tract, whereas *vipaka* has a delayed, systemic effect upon the organism (Sharma, 41). Thus *vipaka* can be seen to an extension of the effect that the *rasas* have on the body, rather than existing as an entirely different process.

Virya: Energetic qualities

Virya is the specific potency by which a *dravya* acts, based primarily on whether it is cold or hot. Once again, this concept is based upon the ancient *vedic agni-saumiya* principle, the primordial division of hot and cold, light and darkness, and male and female. Although hot and cold are the primordial energetic attributes, in practice we can see that any number of qualities can be utilized to differentiate the energetic quality of one particular *dravya* from another. *Charaka* however, lists only six essential energetic attributes, and in practice, this six is for the most part adequate. The following lists the activity of these six *viryas*. (See page 22 for the chart, *The Six Essential Energetics*.)

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Six Essential Energetic		
Virya	Effect on Doshas	General Effect
Hot	Decreases vata and kapha; Increases pitta	Swedana (heating)
Cold	Decreases pitta; Increases vata and kapha	Stambhana (cooling)
Heavy	Decreases vata and pitta; Increases kapha	Brimhana (anabolic)
Light	Decreases kapha; Increases pitta and vata	Langhana (catabolic)
Oily	Decreases vata; Increases kapha and pitta	Kledana (moistening)
Dry	Decreases kapha; Increases vata	Soshana (absorbing)

As hot and cold are the primary energetic qualities of the universe, most *dravyas* will display either one of them, usually in concord with one or another of the other secondary qualities. Sometimes, however, a *dravya* will be neutral in temperament and neither hot nor cold seem especially predominant. In this case, what would normally be the secondary energetic attribute(s) would become the primary one(s).

In every respect *virya* supercedes the actions of *rasa* and *vipaka*, although more often than not the relationship between them is congruent:

Six Essential Energetic			
Rasa	Vipaka	Virya	Examples
sweet	heavy	cold	Althaea officinalis, decreases pitta & vata
salty	heavy	hot	Fucus vesiculosus, decreases vata
sour	light	hot	Crataegus pinnatifida, decreases kapha & vata
pungent	light	hot	Capsicum minimum, decreases kapha
bitter	light	cold	Hydrastis canadensis, decreases pitta & kapha
astringent	light	cold	Quercus alba decreases kapha & pitta

There are however, enough contradictions to this rule that one cannot substitute theory for an intimate knowledge of the *dravya* in question. For example, although meat has a sweet *rasa*, its *virya* is hot.

Amla (*Emblica officinalis*) has a definite *sour rasa*, but its *virya* is cold. Saindhava (rock salt) is salty, but possess a cool *virya*. Haritaki (*Terminalia chebula*) has an astringent *rasa*, but its *virya* is hot. The degree of exceptional characteristics that a given *dravya* displays is often proportionate to its usefulness, and such herbs that contain contradictory qualities are often a better choice in the treatment of complex disease states.⁴

Karma: Therapeutic action

Karma refers to the specific therapeutic activity of a given *dravya*, a concept that in many ways resembles that of Western medicine. In fact, the entire terminology of therapeutic actions commonly used in Western herbal medicine, such as ‘stomachic’, ‘carminative’ and ‘purgative,’ may be used in ayurveda without contradiction. *Karma* literally means ‘action’, and the therapeutic activity of a given *dravya* is an effect (*karma*) based upon the collective activities of *rasa*, *vipaka* and *virya*. Broadly speaking, *karma* is of two basic types: *shodhana* (purificatory) and *shamana* (pacificatory). *Shodhana karmas* are most commonly referred to as the *pancha karmas*, and are *vamana* (vomiting), *virecana* (purgation), *vasti* (enemata), *nasya* (nasal irrigation, errhines), and *rakta mosham* (blood letting). *Shamana* therapies are *brimhana* (anabolics, nutritives), *langhana* (catabolics, cleansing), *svedana* (heating, diaphoretics), *stambhana* (cooling, suppression), *rukshana* (drying, roughening), and *snehana* (oleation).

The *Sarngadhara samhita* (c. 13th CE) lists several types of *karmas* that are commonly used within ayurveda and their elucidation here will give the reader a good understanding of the basic therapeutic approaches. I have included several others not included in the *Sarngadhara samhita* but by no means have I listed all the various *karmas* listed in all the ayurvedic texts.

- 1 Dipana** – *dravyas* which stimulate digestion; e.g. mishi (*Foeniculum vulgare*)
- 2 Pachana** – *dravyas* which ‘cook’ or denature the food which has been consumed; e.g. shunthi (*Zingiber officinalis*) (many *dravyas* in fact contain both the activities of *dipana* and *pachana*, e.g. chitraka (*Plumbago zeylanica*))
- 3 Anulomana** - *dravyas* which assists in digestion and promotes normal bowel movement, e.g. haritaki (*Terminalia chebula*)
- 4 Bhedana** - *dravyas* which forcibly expel the contents of the bowel, e.g. katuki (*Picrorrhiza kurroa*)
- 5 Rechana** - *dravyas* which forcibly expel the contents of the bowel in liquid form, e.g. sveta trivrit (*Operculina turpethum*)
- 6 Vamana** - *dravyas* which remove *kapha* and *pitta* through the mouth by force (i.e. vomiting), e.g. madanaphala (*Randia dumetorium*)

- 7 **Shodhana** - *dravyas* which dislodge the wastes (*malas*) from their respective locations in either an upward or downward direction, e.g. devadali phala (*Luffa echinata*)
- 8 **Shamana** - *dravyas* which return the *doshas* to normalcy by gentle means, e.g. amrita (*Tinospora cordifolia*)
- 9 **Raktaprasadana** - *dravyas* which purify the blood (*rakta*), e.g. manjishtha (*Rubia cordifolia*)
- 10 **Medohara** - *dravyas* which reduce obesity (*medas*), e.g. guggulu (*Commiphora mukul*)
- 11 **Chedana** - *dravyas* which 'scrape' out – for elimination, e.g. marica (*Piper nigrum*)
- 12 **Lekhana** - *dravyas* which dry up excessive moisture in the body, e.g. Yava (Barley)
- 13 **Grahi** - *dravyas* which dry up the excessive moisture in the body and are *dipanapachana*, e.g. jiraka (*Nigella sativa*)
- 14 **Stambhana** - *dravyas* which inhibit bowel movements, e.g. kutaja (*Holarrhena antidysenterica*)
- 15 **Pramathi** - *dravyas* which remove the accumulated *doshas* from the channels of the body (*srotas*), e.g. maricha (*Piper longum*)
- 16 **Abhishyandi** - *dravyas* which by their heavy and sticky nature block the channels (*srotas*), causing heaviness and congestion, e.g. dadhi (yogurt)
- 17 **Rasayana** - *dravyas* which ward off old age and disease (i.e. rejuvenatives), e.g. amalaki (*Emblica officinalis*)
- 18 **Balya** - *dravyas* which increase strength, e.g. bala (*Sida cordifolia*)
- 19 **Vajikarana** - *dravyas* which increase sexual desire and improve sexual fitness, e.g. kapikachu (*Mucana pruriens*)
- 20 **Artavajanana** - *dravyas* which correct menstruation, e.g. kumari (*Aloe vera*)
- 21 **Hrdaya** - *dravyas* which strengthen the heart, e.g. arjuna (*Terminalia arjuna*)
- 22 **Sukshma** - *dravyas* which enter into even the most minute channel of the body, e.g. saindhava (Rock salt)
- 23 **Medhya** - *dravyas* which promote intellect (*buddhi*), e.g. shankhpushpi (*Evolvulus alsinoides*)
- 24 **Vyavayi** - *dravyas* which act very quickly, simultaneously spreading all over the body, e.g. bhanga (*Cannibus sativa*)
- 25 **Madakari** - *dravyas* which cause intoxication, e.g. alcohol

- 26 **Vatahara** - *dravyas* which decrease *vata*
- 27 **Vatakopa** - *dravyas* which increase *vata*
- 28 **Pittahara** - *dravyas* which decrease *pitta*
- 29 **Pittakopa** - *dravyas* which increase *pitta*
- 30 **Kaphahara** - *dravyas* which decrease *kapha*
- 31 **Kaphakopa** - *dravyas* which increase *kapha*

Prabhava: Spiritual potency

Prabhava refers to the activity of a *dravya* that cannot be rationalized within the conceptual framework of *Dravyguna*. Whereas *rasa*, *vipaka*, and *virya* are described as *cintya* (explicable), *prabhava* is *acintya* (unexplicable) (Sharma, 54). An illustration of *prabhava* can be found when we compare *chitraka* (*Plumbago zeylanica*) with *danti* (*Baliospermum montanum*). Both of these *dravyas* have the identical *rasa*, *vipaka* and *virya*, but the latter is a strong purgative whilst the former is not. Thus, *prabhava* describes how certain *dravyas* seem to display a specificity in action that cannot be matched by another herb which otherwise exhibits the same qualities. More often than not, *prabhava* refers to the tropism of a *dravya* to a specific ailment, such as arjuna (*Terminalia arjuna*) for diseases of the heart.

Prabhava is also representative of the spiritual basis of ayurvedic medicine. In regard to medicinal plants, *prabhava* is the Teacher (*guru*), the healing wisdom of the plant that can't be rationalized but only understood only through the experience of spiritual insight. This approach finds resonance in other shamanistic traditions, such as Native American spirituality. Further, it is a description of how a *dravya* can be used in such small amounts that its action cannot be explained by its chemical constituents, as is the case with flower essences. The usage of herbal remedies in an almost homeopathic fashion by the Eclectic-physiomedicalist tradition of the late 19th century very much resembles *prabhava*.

Finally, *prabhava* also refers to techniques used in processing the *dravya*, and the inclusion of incantations during processing. Although such techniques may seem alien and superstitious to the rational practitioner, they have their basis in scientific fact. Thorat and Dahanukar showed how traditional methods of processing crude aconite resulted in a preparation that was assessed to be non-toxic, even at dosages eight times greater than the LD100 for the crude drug (1991).

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Shodhana and Rasashala: Ayurvedic Pharmacy

It is rare that a *dravya* can be taken in its natural or raw state as a medicament without first preparing it in a certain fashion, to either remove impurities and toxins or make the medicament bioavailable. The following techniques are utilized in the processing *dravyas* of vegetable origin, but are not representative of all the techniques used in ayurvedic pharmacy:

1. Pancha kashaya - Water extract

a) *Swarasa* - expressed juice, prepared by taking the fresh plant, wrapping it in cloth and pounding and squeezing it to express the juice. If the fresh plant isn't available, one may also take 1 part of the dried powder and mix it with twice the amount of water. This is allowed to sit overnight before being squeezed out through a cloth.

Swarasa is considered to be the heaviest to digest and most potent of the *pancha kashaya*, and is typically dosed at 25 ml.

b) *Kalka* - bolus, is prepared by grinding the *dravya* in a mortar and pestle and adding just enough water to make a paste. Honey and/or *ghee* (in unequal proportions) are often added to the preparation. It is typically dosed at 10-15 g.

c) *Kwatha* - decoction, prepared by boiling one part (by weight) of the coarsely powdered *dravya* in 16 parts water in a covered earthenware pot, over a medium-low heat until it is reduced by 1/8. *Kwatha* is dosed at 100 ml.

d) *Hima* - cold infusion, prepared by allowing 1 part (by weight) of the coarsely ground *dravya* left to infuse in eight parts (by volume) of water overnight. *Hima* is dosed at 100 ml.

e) *Phanta* - warm infusion, prepared by infusing one part (by weight) of the coarsely powdered *dravya* in 4 parts (by volume) of hot water for 8-10 minutes. The resultant preparation is then filtered out through a cloth or sieve. *Phanta* is typically dosed at 100 ml.

2. Churna - Powdered dravya

Churna are finely powdered *dravyas*, typically dosed at 10-15 g and administered alone or in some combination of honey, *ghee*, sugar or fried *Hingu* resin

(*Asafoetida ferula*). If the liquid is taken with the *churna* it should be four times the volume of the *churna*.

3. Gulika - Pill

Prepared by either cooking the powdered *dravya* with jaggery, sugar or Myrrh resin (*Commiphora mukul*) or macerating it uncooked with a liquid, honey and Myrrh resin, and rolling it into pills. *Gulika* can be dosed anywhere from 250 mg to 4 g, depending upon the ingredients.

4. Lehya - Confection

Prepared by reducing a *kwatha* until all the water has evaporated, after which the resultant residue is collected. It is dosed at 50 g, to which one may add twice the weight of jaggery, and four times the volume of any such liquid that is appropriate. Many *lehya* recipes however are extremely complex in nature and this simple rendering does not account for the preparation of all *lehyas*, and thus dosages may be different.

5. Sneha - Medicated fats and oils

Although there are many methods of making a medicated oil, the most common method consists of mixing one part (by volume) of a *dravya* with four parts fat and sixteen parts water. In most cases, sesame oil is preferred. This preparation is then brought to a boil and simmered over a low heat until all of the water has been evaporated. The resultant preparation is then cooled and strained through a cloth. *Sneha* are typically used as needed in topical procedures, but are also taken internally, usually anywhere from 6 to 12 g. Some *sneha* however, such as *Tuvuraka taila* and *Baladhatryadi taila*, are used in much smaller dosages. Further, when a *sneha* such as *Anu taila* is used for *nasya* (nasal administration), the dosages are between 1 and 10 drops per nostril.

6. Sandhana - Galenicals and fermented liquids

Sandhana are of two types: *asava* and *arishta*, the difference between them is the use of cold and boiled water, respectively. One part (by weight) of the dried herb is mixed with 5 parts (by weight) honey, 10 parts (by weight) jaggery and 25 parts (by volume) water. In the case of *asavas* the above ingredients are mixed together without heat, poured into a earthenware vessel, sealed well, wrapped in cloth and buried for a period of one month. *Arishta* are prepared in a similar manner, except that the *dravya* is boiled in the water first, and when cool, the honey and jaggery are added later.

Anupana: Vehicle

Ayurvedic pharmacology has much to offer phytotherapy, and although its jargon and cultural orientation may seem to present too many hurdles to the Western mind, its practices can greatly assist in deepening one's understanding of therapeutic possibilities.

A special category of pharmacy called *anupana* relates to the usage of certain *dravyas* to assist in the metabolism of the medication, or to enhance its medicinal activity. *Anupana* literally refers to drinking water (*pana*) after (*anu*) the medicament has been consumed, but in a broader context, has come to mean any substance taken with or after the medication. Commonly used *anupana* include water, milk, honey, *ghee*, sesame oil, jaggery, treacle, rice, and meat broth. **Ayurveda** utilizes different *anupana* with the same *dravya* to alter the overall effect of that *dravya*. Dr. Nadkarni, for example, mentions that the daily consumption of haritaki fruit (*Terminalia chebula*) as a tonic alterative is affected by the season in which it is consumed. In his book, *Indian Materia Medica*, Nadkarni details that haritaki is taken every morning with salt during the monsoon (*Varsha*), with jaggery in Autumn (*Sharat*), with *Zingiber officinalis* in the first half of Winter (*Hemanta*) and *Piper longum* in the second (*Shishira*), with honey in the Spring (*Vasanta*), and with treacle during the Summer (*Grishma*) (1208).

Conclusion

Ayurvedic pharmacology has much to offer phytotherapy, and although its jargon and cultural orientation may seem to present too many hurdles to the Western mind, its practices can greatly assist in deepening one's understanding of therapeutic possibilities. There is a congruence in ayurvedic pharmacology between theory and practice that is not found to the same degree in energetic systems of Western herbal medicine. But before *dravyguna* can ever become a part of the theoretical framework of phytotherapy, more investigation is needed to assess the Western herbal materia medica with the tools of *dravyguna*. This is unlikely to be a process that can occur all too quickly - we shouldn't forget the millennia of development that ayurveda has undergone. Eventually, I see a system that can be created which uses a language intelligible to those unfamiliar with Sanskrit, rebirthing, improving upon, and clarifying the energetics of modern phytotherapy. ■

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FOOTNOTES

- 1 Literally, tri (three) + dosha (blemishes), or three "bodily humors."
- 2 The other limbs of Ayurveda include (Anatomy) *Sarira*, Physiology (*Praktiti-vijnana*) and Pathology (*Vikriti-vijnana*).
- 3 Dr. Terry Willard. Personal communication. 3 Mar 1994.
- 4 Alan Tillotson, Personal communication, 14 August 1999. ■