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Inflammatory Joint Disease in Ayurvedic Medicine

Matin Farukh Shaikh*[1], Medha Kulkarni[2]

1. **P. G. Scholar**
2. **Principal, Professor and HOD**

Dept. of Swasthvritta, Dr. DY Patil Ayurved College and Research Centre, Pune, Maharashtra, India

***Corresponding author:** dr.matinshaikh786@gmail.com*

Abstract:

Amavata is a disease of chronic joint and body pain, accompanied by a swelling of some or all of the synovial joints. These symptoms are typically accompanied by immobility, a loss of taste, thirst, indigestion, a lack of enthusiasm, a feeling of heaviness, and fever. If the condition is allowed to progress the pains may begin to migrate from place to place, with an intense stinging and/or burning sensation. There may be scanty, frequent urination, and sleep may become disturbed. The digestion will continue to worsen, with bowel irritability and spasm, constipation, nausea and vomiting. There may be dizziness and/or angina, with profuse perspiration, extreme stiffness and episodic fainting (Srikantha Murthy 1995, 95).

Amavata displays many features in common with a collection of signs and symptoms that are typically diagnosed as rheumatoid arthritis (RA). The cause of RA is still the subject of some contention among pathologists, but most theories to date either advocate an autoimmune mechanism or an infectious agent. In conventional medicine RA is typically treated with non-steroidal anti-inflammatory drugs (NSAIDs), corticosteroids, immunosuppressive drugs Despite the obvious similarities between it and RA, *amavata* is nonetheless very different. It is a distinct etiological and pathological model, based on the interaction and influence of the three *doshas*, vis. *Vata*, *Pitta* and *Kapha*. Thus, the treatment regimen for *amavata* has entirely different objectives than those of RA, and very likely different results. *Amavata* may also include the features of other conditions, from the more pedestrian diagnoses such as arthritis, to more 'exotic' conditions such as ankylosing spondylitis.

Keywords: *Amavata*, RA, rheumatoid arthritis, *vatavyadhi*

Introduction:

History of Amavata

The basic clinical features of *amavata* have been recognized in Ayurvedic medicine for thousands of years. The two oldest texts on Ayurvedic medicine, the *Sushruta* (11 cent. BCE?) and *Charaka* (8 cent. BCE) *Samhitas*, often refer to symptoms such as joint pain and swelling as diagnostic features of other syndromes, such as *jvara* (fever), *rajayaksman* (tuberculosis) and *arsa* (piles). Both of these texts however also describe features of *amavata* in a syndrome called *vatavyadhi*, a diverse group of

symptoms that are organized according to the systemic and local manifestations of *Vata dosha*. According to the *Charaka's* description of *vatavyadhi*, when *Vata* affects the bones *(asthi)* there is painful swelling of the joints and immobility. The *Sushruta Samhita* adds that along with the inflammation, immobility and pain, the joints in *vatavyadhi* disorders eventually become deformed (Kumar 1997, 117-8). Much later another condition called *vatashonita* is described in the *Ashtanga Hrdaya* (6 cent. CE) that has clinical features in common with *amavata*, but a different etiology. As a distinct clinical entity in and of itself *amavata* was only described in the 7 century CE in a diagnostic manual called the *Madhava Nidanam* (1).

The term *amavata* is a combination of two Sanskrit words: *Vata* and *ama*. *Vata* is one of the three *doshas*,or humors, in the Ayurvedic humoral theory. The etymological origin of *Vata* is the Sanskrit word *'va,'* which means 'to move.' Thus *Vata* is the prime mover and motivator in the human body, responsible for the initiation of every kind of activity. The other two *doshas (Pitta* and *Kapha)* are said to be 'lame' without the motivating force of *Vata*. The primary 'seat' *(sthana)* of influence of *Vata* in the body is the area located from the umbilicus downwards, primarily in the large intestine. Here *Vata* allows for the proper elimination of wastes, which allows the body to function unobstructed.

Of the three *doshas*, *Vata* is the most subtle and easily affected. As the principle 'mover' of the body, *Vata* is usually the force behind any kind of physiological dysfunction. *Vata* is identified in the body by its cold *(shita)*, light *(laghu)* and dry *(ruksha)* qualities. The very nature of *Vata* is therefore opposite to that of life, and the natural warmth (e.g. *Pitta)*, heaviness and moistness (e.g. *Kapha)* of the human body.

Ama is a Sanskrit word that means 'undigested food.' As a concept, it arises out of an understanding that when the digestive fire *(jatharagni)* is weak, the result is the accumulation of 'uncooked food' in the stomach. This 'uncooked food' then enters into systemic circulation and into the various bodily tissues *(dhatus)*, slowing, impairing or impeding a variety of metabolic processes. As *ama* accumulates further, the *doshas*begin to become vitiated, and manifest as local or systemic symptoms.

Etiology of Amavata

The clinical description of a given disease and its cause (etiology) evolves from a branch of study within Ayurvedic medicine called *nidana*, a Sanskrit term meaning 'causes.' In practice however, *nidana* not only concerns itself with the etiology of disease but with its description (pathogenesis), and the clinical tools used to assess the patient. Unlike western medicine, Ayurveda will often advocate a variety of causes for a given condition, and in many cases these causes are a similar assortment of psychospiritual, lifestyle, dietary, and environmental factors.

The *Madhava Nidana* provides three basic causes of *amavata:*

•*Weakness of digestion*

The digestive fire is one of the prime motivators of all human function, ensuring the proper absorption and metabolism of nutrition. When digestion is impaired *ama*accumulates, the *doshas* become vitiated, and the vitality *(ojas)* diminishes.

•*Incompatible foods in the diet, including:*

-foods consumed out of season or without respect to local bioclimactic factors

-unfamiliar foods (*asatmya*, i.e. opposite of the healthy norm *(satmya)*, non-traditional foods

-spoilt and contaminated foods, food additives, refined flour, feed-lot and farmed meat, etc.

•*Lack of physical activity*

Physical exercise *(vyama)* is considered an important aspect to *dinacharya*, the daily regimen recommended in Ayurveda. A lack of exercise predisposes one to *amavata*because the circulation of blood to and the removal of wastes *(ama)* from the periphery is impaired.

Pathogenesis of Amavata

The *Madhava Nidanam* states that when the digestive fire is weak and *ama* is allowed to accumulate, it moves to the different locations of *Kapha* in the body (Srikantha Murthy 1995, 95). *Kapha* is derived from the Sanskrit root word *'shlesh,'*which means 'to embrace.' Thus, *Kapha* binds the joints together, nourishing and protecting the articular surfaces (Srikantha Murthy 1994, 169). Like *ama, Kapha* is heavy *(guru)*, moist *(snigdha)* and cold *(shita)* in nature. For this reason, *ama*typically associates with *Kapha* before the other two *doshas*. According to the *Madhava Nidanam*, when *ama* is allowed to accumulate in the joints they become congested with a "…hard, waxy material" (i.e. *Kapha).* Soon the circulatory channels *(dhamanis)* that supply these regions become congested as well. Eventually this blockage affects the heart *(hrdaya)*, which then becomes the "…seat of the disease" (2) (Srikantha Murthy 1995, 95). Once *Kapha* has become vitiated the other *doshas*eventually become involved. To restore homeostasis the body will initiate local inflammatory processes (i.e. *Pitta)* in the joint in order to 'cook' the accumulated *ama*. Despite the inflammatory component of this condition however, the hallmark of *amavata* is the progressive pathological influence of *Vata* in the synovial joints, and the resultant joint degeneration.

The pathogenesis of *amavata* bears some similarity to the recently described intestinal permeability syndrome (IPS). The impetus for IPS is a process by which some agent or combination of agents initiates an inflammatory response in the digestive tract. Persistent gastrointestinal inflammation eventually disrupts the integrity of the mucosal lining of the gut, and tiny perforations allow for molecules larger than usual to pass across this barrier, including molecules from dietary protein and fats, bacteria, parasites and fungi. In response to this infiltration, an immune response is initiated and the body begins to manufacture specific antibodies to these antigens. Unfortunately, many tissues have antigenic sites almost identical to those substances that pass across a permeable intestinal wall. Once activated, these antibodies then circulate and 'look' for more antigens. When an antigen is found, such as a tissue that has similar markers to an exogenous antigen, the antibody initiates an immune response and the tissue begins to be destroyed (Galland 1993). The differences between IPS and *amavata* are obviously significant, with each using an entirely different physiological model. Nonetheless if we can translate the antigens described in IPS into the *ama* identified in Ayurvedic medicine, the two models become strikingly congruent (Kumar 1997, 94).

Although *amavata* is primarily a disease of *Vata*, it is differentiated into three basic subtypes, namely, *Vata*, *Pitta*, and *Kapha*. This differentiation allows the practitioner to identify a greater range of subtlety within the diagnosis and treatment of *amavata.*Where *Pitta* is involved the joints appear red and feel hot, and the patient complains of a burning, searing pain. With *Vata* the pain is severe, and migrates from place to place. With *Kapha* the pain is less, but there is more stiffness and immobility, often combined with sensations of itching. There may also be a combination of any two or three of the *doshas.* If one *dosha* is

involved the condition is said to be easy to cure. With two *doshas* the situation is more difficult, and with all three *doshas* in a state of vitiation the condition is said to be incurable. Similarly, *w*hen there is migrating pain and severe inflammation in the joints of the hands, feet, head, heels, waist, knees and thighs, *amavata* is said to be incurable (Srikantha Murthy 1995, 95-96).

Treatment of Amavata

The basic approach in the treatment of *amavata* is three-fold:

1. support and enhance digestion *(agni)*
2. facilitate the removal of *ama* from the body
3. repair damaged tissues and restore vitality *(ojas)*

To achieve these therapeutic objectives a variety of approaches are taken. The diet should be light and easy to digest, with plenty of pungent and bitter tastes to enkindle digestion and promote the removal of *ama.* Such measures include the use of herbs such as ginger and garlic in the preparation of food, as well as plenty of leafy green vegetables and other whole foods.Heavy, congesting and cold foods are to be avoided in most cases, including dairy, flour, pork, and other greasy or sticky foods that tend to promote congestion. In many cases there are specific items that need to be avoided by a particular individual, such as the solanaceous vegetables like tomatoes and peppers, certain cereals such as wheat or corn, or legumes such as peanuts or soy. To down-regulate the inflammatory response and support tissue restoration a number of nutritional supplements can be used alongside more traditional Ayurvedic therapies, such as halibut liver oil, vitamins B and C, and chelated multimineral supplements.

Traditionally, Ayurvedic medicine employs a method called *pancha karma* in the treatment of *amavata. Pancha karma* involves the usage of a variety of eliminative *(shodhana)* therapies, such as emesis *(vamana),* purgation *(virechana),* enemata *(vasti)* and errhines *(nasya).* These treatments are performed very carefully in an in-patient facility over a period of weeks. Prior to the application of these therapies, a variety of preparatory treatments *(purva karmas)* are utilized to prepare the body for *pancha karma*. These typically include a combination of oleation (oil massage, *snehana)* and sudation (diaphoretic, *svedana)* therapies.

While *pancha karma* is certainly considered the most effective treatment for *amavata*, a combination of eliminative *(shodhana)* and palliative *(shamana)* treatments can be employed on an out-patient basis to good effect, and has several practical advantages over *pancha karma.*

Although the *purva karmas* such as *snehana* and *svedana* are typically used prior to *pancha karma*, they may also be used at the onset of treatment and on an ongoing basis in an out-patient regimen. Patients can be encouraged to apply prescribed medicated oils (e.g. *kottamchukkadi taila, brhat saindhavadya taila)* to the affected joints or the entire body. These areas are then treated with some kind of sudation therapy, locally, such as heated sand in a linen bag or a hot water bottle, or more generally, as in a sauna or steam bath. Similarly, medicated salves, fomentations and poultices may also be applied locally to help facilitate the removal of *ama.* Typical herbs used in such external preparations include pungent and bitter tasting herbs with rubefacient and decongestive properties, such as *dhattura (Datura stramonium), shunthi (Zingiber officinalis), haritaki (Terminalia chebula), kushta (Saussurea lappa), rasna (Vanda roxburghii)* and *vacha (Acorus calamus).* Important oils *(taila)* used

in *amavata* are castor and sesame oil. Other medicaments for external usage include *saindhava* (rock salt) and *dadhi* (milk curd). Care must be taken when applying some of these agents in periods of exacerbation, as they can make the symptoms much worse, even while assisting the removal of *ama.*

Another therapy used in *pancha karma* that has application on a clinical basis is enemata *(vasti)* therapy. The fluid used in enematavaries according to the specifics of each case, sometimes alternating between aqueous-based and oil-based medicated preparations. In most cases a relatively common recipe called *madhutailika* will suffice:

- 600 mL *eranda mula (Ricinus communis* root) decoction
- 230 grams each of honey and sesame oil
- 15 grams of *saindhava* (rock salt)
- 30 grams of *shadhakva churnam* (*Anethum graveolens* powdered herb).

The ingredients are mixed together well in a mortar, the heat from the *eranda* decoction allowed to cool to a suitable temperature before application.

Enema therapy is considered very important in *amavata*, as the colon is both the seat of *Vata*, and the primary organ that eliminates *ama* from the body.

Regular exercise is another important aspect in treatment of *amavata*, to enhance the circulation to and away from the affected areas and thereby facilitate the removal of *ama*.

The *Ashtanga Hrdaya* recommends that one should exercise to one-half one's strength in the winter and spring, and to a lesser extent in summer and fall, until sweat appears on the forehead and in the axilla (Srikantha Murthy 1994, 25). Typically, gentle exercises such as walking or simple *hatha yoga* positions *(asanas)* are recommended at the outset of treatment. Depending on the severity of the condition however, the person would do well not to engage in any strenuous exercise that might damage the joints further.

Internally a variety of therapies may be recommended, from simples such as *shunthi(Zingiber officinalis)*, to complex polyherbal formulations such as *yogaraja guggulu*, to specially purified mineral preparations *(rasa)* such as *maha lakshmivilasa rasa*. The commonality between these various remedies is their specific ability to assist in the removal of *ama.* Many of these herbs and formulas have additional properties, such as a special ability to reduce pain and inflammation, treat infection, or restore function to a damaged tissue or organ. The following are five botanicals that are commonly used in the treatment of *amavata*, chosen somewhat randomly from an enormous number of possibilities.

Botanicals

Guggulu - Commiphora mukul

Guggulu is the oleo-gum resin derived from the stem bark of *Commiphora mukul*, a shrubby tree with spiny branches found throughout the subcontinent of western Asia, Arabia and eastern Africa. On the subcontinent of India it is found in dry sub-tropical areas such as the Sindh, Baluchistan, and the Deccan plateau. The leaflets are arranged in clusters of one to three, the lateral leaflets typically half the size of the terminal ones. Similar species include *C. molmol* and *C. myrrha.* When fresh the oleo-gum resin is moist, fragrant and golden in colour. It burns in fire, melts in the sun and when mixed with hot water forms a milky emulsion. *Guggulu* is widely used in Ayurvedic medicine as an excipient, utilized in the manufacture of pills and pastes (Kirtikar and Basu 1935, 527; Nadkarni 1954, 167; Varier 1996, 164).

Guggulu gum has a bitter *(tikta)*, pungent *(katu)* and

astringent *(kashaya)* taste *(rasa),* and a hot *(ushna),* dry *(ruksha)* and light *(laghu)* energy *(virya).* It is used in *amavata* to enkindle digestion *(dipanapachana)* and raise the body heat to the periphery *(swedana). Guggulu* acts to 'dry up' *(soshana)* and diminish *(langhana)*the accumulated *ama* in the channels *(srotas). Guggulu* is indicated in vitiations of *Vata* and *Kapha,* but is typically contraindicated in *Pitta* conditions. Fresh *guggulu* is considered to be anabolic and nourishing *(brimhana),* whereas old *guggulu* is considered depleting *(lekhana).* In the treatment of *amavata, guggulu* is typically combined with other ingredients in a formula called *yogaraja guggulu* (Dash 1991, 179; Nadkarni 1954, 167; Varier 1996, 164).

Guggulu has been the subject of fairly extensive scientific research, and has been shown to exhibit antihelminthic, anti-obesity, antioxidant and hypocholesterolemic effects in human clinical trials (Sheir et al 2001; Bhatt et al 1995; Singh et al 1994; Nityanand et al 1989). In experimental models, *guggulu* has displayed antitumor, antifungal, anti-inflammatory, muscle-relaxing, cardioprotective, hypotensive, bradycardiac and thyrotropic effects (Abdul-Ghani and Amin 1997; al-Harbi et al 1997; Andersson et al 1997; Qureshi et al 1994; Lata et al 1991; Tariq et al 1986; Tripathi et al 1984; Sarbhoy 1978).

Haritaki - Terminalia chebula

Haritaki is the fruit of *Terminalia chebula*, a large deciduous tree found throughout India in both forested areas and dry slopes, from the Himalayas to southern India. The young leaves are covered in rust-coloured hairs that become glabrous when mature, and are rounded at the base, elliptic to oblong, tip acute. The small flowers are dull-white to yellowish in color, arising in simple spikes or panicles. The mature fruits are shiny, glabrous, yellow to orange-brown drupes. Both the immature and mature fruits are used medicinally (Kirtikar and Basu 1935, 1020-21; Varier 1996, 263).

Haritaki is perhaps the most important medicinal plant in the Ayurvedic materia medica, the first among plants listed in every *nighantu. Haritaki* possesses all tastes with the exception of salty *(lavana).* The post-digestive effect *(vipaka)* is sweet *(madhura),*and the energy *(virya)* is hot *(ushna),* light *(laghu)* and dry *(ruksha).*Similar to *guggulu, haritaki* is used to enkindle digestion *(dipanapachana),* and remove *ama* by virtue of its dry and light properties. *Haritaki* is also used as a rejuventative *(rasayana),* taken on a daily basis to ward of old age and disease. It reduces the vitiation of all three *doshas* (humors), and is considered to strengthen the mind and nervous system *(medhya rasayanam).* The unripe fruit is more astringent and less purgative than the mature fruit, and is used in the treatment of dysentery and diarrhea (Dash 1991, 8; Nadkarni 1954, 1207; Varier 1996, 263).

Categorized by many as a simple purgative, *haritaki* has yet to stimulate much interest in the scientific community. *Haritaki* has been shown to have antimicrobial, antitumor and hypocholesterolemic effects in experimental models (Sohni et al. 1995; Phadke and Kulkarni 1989; Dutta et al 1998; el-Mekkawy et al 1995; Creencia et al 1996; Thakur et al 1988).

Guduchi – Tinospora cordifolia

Guduchi is a large deciduous perennial climber found throughout tropical regions of the subcontinent of India and south-east Asia. It has large succulent stems and papery bark; the leaves are glabrous and cordate; the male flowers yellow-white and clustered; the females flowers yellow-white and solitary. As it climbs upwards *T.*

cordifolia sends down long, pendulous fleshy roots. The stem is used medicinally (Kirtikar and Basu 1935, 77-78; Varier 1996, 283).

Guduchi is bitter (tikta), astringent (kashaya) and sweet (madhura) in taste (rasa). The post-digestive effect (vipaka) is sweet (madhura), and the energy (virya) is light (langhana) and mildly warming (ushna). Like many herbs that are used in the treatment of amavata, guduchi enkindles the digestive fire (dipana) and promotes the removal of ama through its light (langhana) properties. Although classified in many nighantus as warming in energy, the balance between its bitter and sweet tastes makes guduchi specific to disorders and deficiencies of the liver, blood, and skin, and to reduce the vitiations of Pitta. Guduchi is often used along with circulatory stimulants such as Zingiber officinalis in the treatment of conditions such as amavata, to reduce the symptoms of inflammation and pain. Taken with ghee guduchi is used to treat Vattic conditions, with jaggery for Pitta, and with castor oil for vitiated Kapha (Dash 1991, 14; Dash and Junius 1983, 139; Kirtikar and Basu 1935, 78; Varier 1996, 283).

Guduchi has demonstrated immunosupportive and hepatoprotective effects in human clinical trials (Rege et al 1993). Experimental models for Tinospora cordifolia and similar species have demonstrated adaptogenic, antioxidant, hypolipidemic, antimalarial, hepatoprotective and immunomodulatory effects (Prince et al 1999; Prince and Menon 1999, Rege et al 1999; Najib et al 1999; Thatte et al 1994; Bhattacharya et al 1991).

Ashwagandha - Withania somnifera

Ashwagandha is the root of *Withania somnifera*, an erect undershrub found in the drier parts and wasteland of the Indian subcontinent, the Middle East and Africa. It attains a height of between 0.3-1.5 meters, with simple, alternate ovate leaves up to 10 cm in length. The flowers are green to yellow, borne on short axillary clusters, fruits spherical, orange-red when mature, enclosed within the inflated calyx (Kirtikar and Basu 1935, 1774; Mills and Bone 2000, 596; Varier 1996, 409).

Ashwagandha has a mildly bitter *(tikta)* and astringent *(kashaya)* taste *(rasa).* The post-digestive effect is sweet *(madhura)* and the energy *(virya)* is warm *(ushna)* and heavy *(guru)* in nature. Although *Ashwagandha* has applications in many disorders it is considered a specific for mitigating *Vata. Ashwagandha* is an important herb in the treatment of *amavata,* although it has a different application and mode of action than some of the other herbs already discussed in this paper. *Ashwagandha* is reasonably contraindicated in *amavata* because of its anabolic *(brimhana)* effects in the body, a property that would tend to facilitate the production of *ama*. *Ashwagandha* should probably not be used at the outset of treatment, but only after much of the *ama* has already been removed. Its best application is as a rejuvenative *(rasayana),* used to restore damaged tissue, and as a palliative *(shamana)* in severe conditions. *Ashwagandha* has a special ability to restore the nervous system *(medhya rasayana),* relieve pain *(vedanasthapana),* and promote sleep. *Ashwagandha* has demonstrateda hypoglycemic, diuretic and hypocholesterolemic effect in human clinical trials (Andallu and Radhika 2000). In combination with *Boswellia serrata* stem, *Curcuma longa* rhizome and a zinc complex (Articulin-F), *Ashwagandha* was shown to have a significant effect in the reduction of pain, in a randomized, double-blind, placebo controlled, cross-over study in patients with osteoarthritis (Kulkarni et al 1991). Experimentally *Withania* has demonstrated adaptogenic, anti-inflammatory,

antioxidant, antitumor, chemoprotective, gabanergic, analgesic, and immunomodulant effects in animal models (Archana and Namasivayam 1999; Davis and Kuttan 1998; Dhuley 1998; Bhattacharya et al 1997; Kulkarni and Ninan 1997; Devi 1996; Ziauddin et al 1996; al-Hindawi et al 1992, 1989; Mehta et al 1991).

Bhallataka - Semecarpus anacardium

Bhallataka is *Semecarpus anacardium*, the cashew tree. Although some sources indicate that this moderate sized semi-deciduous tree was brought to India from South America by the Portuguese, *Bhallataka* is clearly mentioned in both the *Sushruta* and *Charaka samhitas*, texts which antedate the Portuguese by more than a millennia (Varier 1996, 98). *S. anacardium* is now cultivated all over the world as a food, in moist tropical forests, and in the subcontinent ranging from the sub-Himalayas and Assam in the north, to the coast of Kerala in the south.. The grey bark exfoliates in small irregular flakes, and the leaves are simple, alternate, obovate-oblong, rounded at the apex, glabrous above and pubescent below. The greenish fruits are ovoid to oblong drupes that are attached to a swollen, fleshy receptacle that sits below it and turns yellow when ripe (Kirtikar and Basu 1935, 667; Varier 1996, 98). The toxic pericarp is a by-product of the cashew industry, where special care is taken to remove it from the cashew kernel. The juice of the pericarp is vesicant and eschariotic, used at one time in India as a marking ink (Nadkarni 1954, 1120-21). The sap of the tree has also been shown to be quite toxic, with one reported case in the literature of severe dermatitis, anuria, and renal cortical necrosis from skin exposure (Matthai and Date 1979). The whole fruit and pericarp are used medicinally.

Bhallataka fruit is pungent *(katu)*, bitter *(tikta)*, astringent *(kashaya)* and sweet *(madhura)* in taste. It has a sweet *(madhura)* post-digestive effect *(vipaka)*, and a light *(laghu)* and hot *(ushna*) energy *(virya)* (Dash 1991, 99; Nadkarni 1954, Varrier 1996, 98). The *Ashtanga Hrdaya* (7 cent CE) considers *bhallataka* fruit to be "…like fire in property, increasing intelligence and effectively mitigating *Vata* and *Kapha*(Srikantha Murthy 1994, 100). *Bhallataka* has long been considered an important remedy in the treatment of a variety of complaints including rheumatism, liver disorders and hemorrhoids, considered equal to mercury in action (Nadkarni 1954, 1120). The pericarp however contains a variety of toxic principles that can precipitate a skin rash and renal failure if the dose is too large or if the remedy is prepared incorrectly. Some individuals appear to be more sensitive to *bhallataka* than others. Among the many preparations that contain *bhallataka* is a *rasayana* mentioned by the *Chakradatta*(12 cent CE)called *amritabhallataka.* In the preparation of this remedy *bhallataka*fruit is first boiled in water, the fruits removed, and the decoction mixed and cooked with milk, ghee and jaggery (Sharma 2002, 648). The *Chakradatta* states that this preparation is the "king of all *rasayanas*,"and may be used on an ongoing basis to promote strength and longevity (Sharma 2002, 648). Toxicological studies for a milk extract of *bhallataka* called *serankottai nei* indicated that when processed correctly *bhallataka* is remarkably well-tolerated (Vijayalakshmi et al 2000).

Bhallataka has displayed anticarcinogenic, neuroprotective, antioxidant, anti-inflammatory, cytotoxic, and hypocholesterolemic effects in experimental models (Shukla et al 2000; Premalatha and Sachdanandam 2000; Premalatha and Sachdanandam 1999; Vijayalakshmi et al 1997; Sharma et al 1995; Smit et al 1995).

Yogaraja Guggulu

Although individual herbs and simple formulations are used in Ayurvedic medicine, more often herbal medicine takes the form of complex polyherbal formulations. Among the most important of these formulas in Ayurvedic medicine is *yogaraja guggulu* the recipe here taken from the *Chakradatta*:

Reduce to a fine powder and combine in equal parts (by weight): *chitraka (Plumbago zeylanica* root), *pippalimula (Piper longum* root), *yavani (Trachyspermum ammi*seed), *Krishna jiraka (Carum carvi* seed), *vidanga (Embelia ribes* fruit), *ajamoda (Carum roburghianum* fruit), *devadaru (Cedrus deodara* heart wood), *chavya (Piper chaba* stem), *ela (Elettaria cardamomum* fruit), *saindhava* (rock salt), *kushta (Saussurea lappa* root), *rasna* (*Vanda roxburghii* leaf and root), *gokshura (Tribulus terrestris* fruit), *dhanyaka (Coriandrum sativum* fruit), *triphala* (equal parts *Terminalia chebula* fruit, *Terminalis bellerica* fruit, *Emblica officinalis* fruit), *musta (Cyperus rotundus* rhizome), *trikatu* (equal parts *Piper longum* fruit, *Piper nigrum* fruit, *Zingiber officinalis* rhizome), *tvak (Cinnamomum zeylanicum* stem bark), *ushira (Vetiveria zizanioides* root), *yavakshara* (an alkaline preparation derived from *Hordeum vulgare*), *patra* (*Cinnamomum tamala* leaf)and *talishapatra (Abies webbiana* leaf). Add a quantity of *guggulu* equal to the weight of the above combined ingredients, and then slowly add enough ghee while mixing in a mortar to form a soft mass.

The *Chakradatta* states that *yogaraja guggulu* is a medicine like "…nectar," useful in the treatment of *amavata*, and other conditions such as helminthiasis, chronic ulcers, splenomegaly, and piles. *Yogaraja guggulu* "stimulates the digestive fire, promotes energy and strength, and overcomes *vatika (Vata)* disorders even if located in the joints and marrow" (Sharma 2002, 250). The Ayurvedic Formulary of India suggests a recommended dose of 3 grams (1978, 58-59).

Conclusion:

The signs and symptoms typically associated with rheumatoid arthritis are clearly mentioned throughout the Ayurvedic literature. If one conducts a survey of the most important texts, these symptoms are found grouped together in a variety of different ways, sometimes with other symptoms, and given different names. All of these conditions are clinically relevant in Ayurvedic medicine, but *amavata* specifically is most often correlated with rheumatoid arthritis. Unlike the typical approaches used in Western medicine, Ayurveda employs a variety of sophisticated holistic treatment methods to decrease joint pain and inflammation, and restore the joints to a degree of normalcy. While not all, many of the botanicals used by Ayurvedic herbalists in the treatment of *amavata* have undergone a significant degree of scientific investigation. The vast majority of these studies, comprised of both human clinical trials and experimental models, have validated traditional Ayurvedic herbology in the treatment of inflammatory joint disorders.

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Footnotes

1. About a century or so before the *Madhava Nidanam* the *Ashtanga Hrdaya* (6 century CE) described a condition called *vatashonita* (*vatarakta)* that is often transliterated as gout, but bears many similarities to rheumatoid arthritis and inflammatory joint disease in general. Unlike the etiology described for *amavata*, *vatashonita* is caused by the simultaneous vitiation of *Vata* and *shonita* (blood).
2. According to the Ayurvedic understanding of physiology, the heart receives the immediate products of digestion *(rasa)* and transports it throughout the body as blood *(rakta).*

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Matin Farukh Shaikh, Medha Kulkarni

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