

## Pharmacognosy in Various Systems Medicine

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### ABSTRACT

Medicinal plants based traditional systems of medicines are playing important role in providing health care to large section of population, especially in developing countries. Interest in medicinal plants as a re-emerging health aid has been fuelled by the rising costs of prescription drugs in the maintenance of personal health and well-being, and the bio prospecting of new plant-derived drugs. Medicinal plants are an integral component of ethno veterinary medicine. Farmers and pastoralists in several countries use medicinal plants in the maintenance and conservation of the healthcare of livestock. About 90% of the marketed plant drugs are obtained from wild resources. Today, traditional drugs are used as a starting point for the development of novelties in drugs. The practice of traditional medicine is widespread in China, India, Japan, Pakistan, Sri Lanka and Thailand. The Indian traditional medicines can be classified into two groups. In the first group are the medicinal preparations belonging to the Ayurvedic, Siddha, & the Unani systems while the folk medicines belong to the second group.

**Key words:** role of pharmacognosy in allopathy and traditional systems of medicine namely, Ayurveda, Unani, Siddha, Homeopathy and Chinese systems of medicine.

recent years and represents one of the major subjects in the field of pharmacy[2]. Its scope includes the study of physical and chemical characteristics as well as therapeutic properties of crude drugs of biological origin. It has also led to the development of novel drugs and nutraceuticals. Research work in pharmacognosy is done in the areas of botany, zoology, phytochemistry, chemistry of natural products, biosynthesis, biotransformation etc. Medicinal plants possess diverse chemical compounds that can elicit different pharmacological actions. Therefore, they often serve as chemical models or templates of new drug leads and new chemical entities. According to a latest research, about 80% of the existing drugs during the period of 1994-2007 were based on natural products. Today, the discovery of allopathic drugs from medicinal plants have become more advanced process involving the arc of techniques like mass spectrometry, NMR spectroscopy etc. These techniques have markedly reduced the effort and time required for the structural elucidation of crude extracts, Moreover, they require very little quantities of plant extract analysis[9]. Medicinal plants that serve as a source of different leads for several allopathic drugs have been mentioned in the following table.

## I. INTRODUCTION

### 1.1 Role of pharmacognosy in allopathy

Pharmacognosy is a branch of applied science, which has developed immensely in the

Table 1: Medicinal Plants as a Source of Lead for Drugs

Category	Plant source	Active compound
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1.	Antidiabetic	Karela (Momordica charantia)	Charantin Gymnemic acid IV
2.	Anti-inflammatory	Gurmar (Gymnema sylvestre)	Boswellic acid Curcumin
3.	Cardiovascular	Guggul (Boswellia serrata)	Withanolides Reserpine
4.	Anti-leishmanial	Turmeric (Curcuma longa)	Arjunolic acid Diospyrin
5.	Anti-malarial	Aswagandha (Withania somnifera)	Plumbagin Biflavonoids
6.	Anti-obesity	Rauwolfia (Rauwolfia serpentina)	Nimbolide Tea polyphenolides
7.	Antiviral	Terminalia arjuna	Gallic acid, chebulagic acid and other galloyl glucose.
8.	Anti-neoplastic	Diospyros species Plumbago species Selaginella bryopteris Neem (Azadirachta indica) Alpinia officinarum Terminalia bellerica  Combretaceae family members	Combretastatins

The isolated active molecules from traditional medicinal plants, other than serving as valuable traditional drugs are also used as lead molecules. These molecules upon chemical modification or as such serves as template for the

designing of synthetic molecules that hold the pharmacologically active agents eliciting the desired activity [1]. Certain examples of such drugs are represented in the following table allopathic drugs have been mentioned in the following table.

Table 2: Allopathic Drugs Developed from Traditional Medicinal Plants

Drug	Template	Plant source	Uses
Verapamil	Papaverine	Papaver somniferum	Clinical Use: Angina and cardiac arrhythmias. Traditional Use: As analgesic and soporific in Mediterranean region.
Sodium cromoglycate	Khellin	Ammi visnaga	Clinical Use: Antiasthmatic Traditional Use: To treat bronchial disorders in Egypt.
Neostigmine Metformin	Physostigmine Galegine	Physostigma venenosum Galega officinalis	Clinical Use: To treat myasthenia gravis Clinical Use: To treat type-2 diabetes Traditional Use: To treat diabetes in Europe
Etoposide	Podophyllotoxin	Podophyllum peltatum	Clinical Use: Anticancer agent Traditional Uses: Purgative and in wort treatment in
Bromocriptine	Ergotamine	Claviceps purpurea	
Atracurium	Tubocurarine		

		Chondodendron tomentosum	<p>North America.</p> <p>Clinical Use: Antiparkinsonian agent          Traditional Use: As an oxytocic in Central Europe.</p> <p>Clinical Use: Muscle relaxant</p>
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### 1.2 Traditional systems of Medicine

For more than a century the conventional or allopathic system of medicine has dominated the picture all over the world as the standard system of medicine. Highly advanced technology and drugs based on chemical compounds instead of natural therapies and herbal medicines are used to research, diagnose, and treat diseases. The ever-increasing rate and range of technology and therapeutic advancements in the conventional medicine has raised the expectations of the general population of curing all their illness. Despite these advancements, the fact that there remain many limitations to the treatment of diseases that fails to guarantee 100% curative results has brought disillusionment among the public. This has led to an increasing search for traditional panacea particularly by those who have not benefitted from the previous treatment, those who have apprehensions concerning the toxicity and safety of modern drugs and by those who cannot meet the extraordinary expenses in most of the countries [10].

Since many patients are left dissatisfied and finding it difficult to continue, it is obvious that traditional medicines are required, expected, demanded, and accepted.

Traditional medicine is a term employed for all the healing practices that do not fall within the realm of conventional medicine. It includes a variety of therapeutic and preventive health care practices such as Ayurveda, Homeopathy, naturopathy, chiropractic, aromatherapy, acupuncture, rei-koi, magnetotherapy, yoga and herbal medicine that do not follow generally accepted medical methods and may not have a scientific explanation for their effectiveness. Traditional systems of medicine also referred to as complementary, supporting or assisting medicine are not part of the standard conventional medicine but are the ones that are used along with or instead of the standard care provided by doctors or allied health professionals such as nurses, pharmacists, physical therapists. Traditional medicine has been prevalent in various countries like India and China

much before the development of present-day medical science. For example, in India, Ayurveda, meditation, yoga, Unani herbal medicine and siddha have been used since ancient period to heal the body.

In contrast to the conventional health care practitioners who are primarily concerned with identifying the symptoms and treating the disease in the affected part of the body only, the complementary and traditional medicine practitioners take a holistic approach to patient care. They treat the patient as a whole person but not just a set of symptoms. They tend to be strongly prevention oriented and regard a high value to the body's natural ability to heal itself. They employ certain low-tech, hands-on techniques and principles many of which can be traced to long-established ancient traditions in treating patients.

Few of the basic principles followed by traditional medicine practitioners are:

They rely on the intrinsic ability of the body to heal itself and focus on strengthening the immune system. They do not rely on prescription drugs, surgery, and other conventional medical procedures, rather they use natural methods and remedies. They look at the whole person, and take into consideration the mind, body and spirit when diagnosing and treating a patient. They focus not just at the symptoms and the disease but also at the underlying causes.

The goal of the treatment is not just to cure or fix a symptom but to create and restore optimum mental, physical, and spiritual health in the person. They promote on-going care to prevent disease.

The claims made by traditional medicine practitioners are not accepted by conventional medical practitioners because of lack evidence-based assessment of safety and efficacy. Still now-a-days many people are turning gradually towards traditional therapies as these are safe, have no side effects, expenses are reasonable, and these are equally effective in the treatment of patients with

diseases which the conventional medicine cannot cure.

## II. AYUSH

AYUSH or the department of Ayurveda, yoga and Naturopathy, Unani, Siddha and Homeopathy was established in the year 1995. It was formerly known as department of Indian systems of Medicine and Homeopathy (ISMH). The establishment of ISMH was the collective result of research and coordination carried out by central council for Ayurvedic Research in Indian Medicine and Homeopathy (CCRIMH). The ISMH was renamed as Ayush in November 2003. It plays a key role in revival of traditional medicine in our country [12-14].

### 2.1. Plans of AYUSH

The main agenda of AYUSH is to develop and promote the practise of traditional medicine in India. The following are the plans for this purpose.

1. Elevation of research as well as cultivation and regeneration of medicinal plants.
2. Regularization of educational standards and laying down of pharmacopoeia standards for improvement of quality of medicinal products by complying with Good Manufacturing Practices (GMP) and Good Laboratory practices (GLP).
3. Appreciation of traditional systems of medicine by establishing AYUSH clinics in district allopathic hospitals and spreading knowledge and effectiveness of AYUSH among people for its integration in health care.

### 2.3. Ayurvedic system of Medicine

The term Ayurveda is derived from the Sanskrit words Ayur meaning "life" and Veda meaning "knowledge or science" ie, "science of life". It is the most ancient original system of Indian medicine believed to have evolved over 5000 years ago in the far reaches of the majestic Himalayas, presumably from the deep wisdom of spiritually enlightened rishis or sages [12].

Ayurveda was first perceived by Brahma who taught this science to Daksha Prajapati who taught it to Aswani Kumars and so on. The Hindu mythology described in the four spiritual texts called Vedas Viz., Rigveda, Yajurveda, Samaveda and Atharvaveda. They were compiled 5000 years ago by the Aryans during the vedic age of the prominent Indian sage Srila Vyasadeva. Ayurveda is said to be an Upaveda (part) of Atharvaveda. It is

the science of health and healing practised by ancient Aryans based on the principle "maintaining the health of a relieving the diseased from the disease condition" [14].

Around 900 BC, Charaka, a great sage and a physician of atreya school (school of physicians) wrote "Charaka Samhita" describing 341 medicinal plants and gave a comprehensive illustration of human anatomy, growth of foetus within the womb, etiology of physical and spiritual illness, their treatment and preventive measures. The next landmark in Ayurveda was around 600 BC when Sushruta a surgeon from the Dhanvantari school (school of surgeons) wrote "Sushruta Samhita" mentioning 395 medicinal plants and described the physiology of joints, nerves, and organs. His manuscript also included the list of medicinal agents derived from animals, minerals and metals and provided the description of well-developed surgical equipments employed to perform plastic surgery and amputation. It also described the method to perform massage as performed by the Chinese acupuncturists using major nerve intersections described as marma points.

"Asthang Hridaya" which originated in the 7th century AD is the best book highlighting the principles and practice of medicine by Vagbhata.

Charaka, Sushruta and Vagbhata are regarded as the "powerful traid" (Vrihat Traya) of the golden period of Ayurveda extending from 900 BC to 1000 AD.

In about 9th century, Madhava wrote "Madhava Nidana Samhita" which exclusively deals with the diagnosis of a disease. In 14th century, Sarangdhara in his Materia Medica entitled "Sarangdhara Samhita" has emphasized on the principles of Ayurveda. The last authoritative writing on Ayurveda was "Bhava Prakasha" by Bhava Mishra of Magadha who described the preparations of numerous medicinal compounds.

According to Charaka Samhita Ayurveda is defined as the knowledge that indicates the appropriate and inappropriate, happy and sorrowful conditions of living, what is auspicious or inauspicious for longevity of life. It is a traditional and natural healing system based on the interaction of body, mind, and soul. Ayurveda includes herbal medicine, dietetics, body work, surgery, psychology and spirituality hence treats each person in a holistic approach.

Ayurveda is based on the hypothesis that all the objects in the universe including the human

body are composed of five basic elements called panchamahabhutas namely uhva(earth),jal(water),teja(fire),akash(vacuum space or ether). These elements exist in the human body in different proportions in a balanced state as per the needs and requirements of different structures and functions of the tissues.

The growth and development of the body depends on its nutrition i.e,on food ,which again is composed of the panchamahabhutas that replenish and nourish like elements of the body. The panchamahabhutas are represented in the human body as dashas, dhatus and malas.

The humours or fluids called doshas are the physiological entities that are derived from the different combinations and permutations of these five elements. The doshas namely wind or vata(vacuum and air),bile or pitta(fire and water),phlegm or kapha (water and earth)are present all through the human body.

Ayurveda is largely based on the important principle that these doshas,together called as tridosha exist in human body in harmony and influence all mental and physical processes. As long as these remain in balance,the body remains healthy and any derangement in their proportion subjects the body to all sorts of disordered conditions. The tissues or dhatus are the basic structural entities of the body each one having its own function.

The dhatus are seven in number collectively called saptadhatus viz rasa(lymph), rakta (blood), meda (adipose tissue), mamsa (flesh), asthi (bones), majja(nervous tissue) and shukra(reproductive tissue). The saptadhatu are subjected to wear and tear and results in the formation of mala(excretory material). The chief malas are mutra(urine),shakrit(faeces)and sweda(perspiration). When tridosha,saptadhatus and malas are in balance with each other,it is called a healthy condition while imbalance results in pathological conditions.

The science of Ayurveda is divided into eight branches:kaya chikitsa(general medicine), Balachikitsa (paediatric treatment),Salakyachikitsa (ENT treatment),Vishachikitsa(toxicology),Jarachikitsa(tr eatment related to genetics),Shalya chikitsa(surgery),Vajikarama chikitsa(treatment with rejuvenation and aphrodisiacs) and Graham chikitsa (mental treatment with planetary effects).

Each branch is again divided into two departments and three sections, the departments are Swastha Vrittam which deals with promotion of

positive healthy and Abura Vrittam which deals with prevention and treatment of a disease. The three sections are etiology,diagnosis and treatment.

In Ayurveda, the diagnosis of disease is considered more important than the treatment. A disease is attributed to the ineffectiveness of tridoshas. For example, pain or loss of function indicates aggravated state of vata, burning sensation or loss of appetite is indicative of high pitta and vitiation or ineffectiveness of kapha is known by heaviness or accumulation of fluid.

The classical clinical diagnosis in Ayurveda is called astha sthana pariksha (eight-point diagnosis) that includes assessment of the state of the doshas as well as the physical signs. The eight point diagnosis are nadi pariksha (pulse diagnosis), mutra pariksha (urine examination), mala pariksha (stool examination),jihva pariksha (tongue examination), shabda pariksha (examination of body sounds), Vata/sparsha (nervous system assessment),pitta/drik (assessment of digestive fire and metabolic secretions).

Treatment directs avoiding causative factors responsible for setting in disequilibrium between the structural (dhatus)and physiological(doshas)entities of the body through the use of panchakarma, medicines, suitable diet,activity and regimen for restoring the balance and strengthening the body functions and to prevent or minimize the future occurrence of the disease. It is hypothesized that various pathological conditions can be treated by applying the five characteristic properties of the medicinal herbs i.e,rasa(taste),guna(physicochemical properties), virya(potency), vipak(post digestive effects) and prabhava (therapeutic effect).

Examples of some important drugs used in Ayurveda are Rauwolfia serpentina, Withania somnifera, Piper nigrum, Shilajit, Gandhak etc.

### Preparation of Ayurvedic Dosage

Ayurveda literally means science of life. It comprises of the knowledge of medicines and the art of healing. A variety of Ayurvedic dosage forms have been used since ancient times and some of them are used even to this date. Ayurvedic pharmacy (Bhaishajya vigyan) proposes five basic dosage forms like swarasa, kalka, kwatha, hima and phanta. Present day Ayurvedic dosage forms includes tablets, creams, ointments and even injections. All the Ayurvedic preparations are mostly polyherbal preparations prepared by employing various pharmaceutical processes like

size reduction and separation, extraction, fermentation, distillation, evaporation etc.

**The various methods of preparing ayurvedic dosage forms are discussed below,**

**1.Simple Expression/Extraction**

In this method, fresh vegetable drugs are pounded in a mortar with a pestle. The juice is expressed out and strained through a muslin cloth.

**2.Infusion**

Cold infusion (shita kasaya) is prepared by infusing the drug with 8 parts of cold water for 12 hours and then straining through a muslin cloth. Hot infusion (phanta kasaya) is prepared by infusing the drug with hot water.

**3.Maceration**

This process called bhawana is similar to the modern maceration process. The powdered drug is macerated with either fresh juice of a drug or its decoction or decoction of polyherbs till the solid is completely soaked. This method is usually employed for mineral drugs.

**4.Decoction**

Kwatha or decoction is prepared by boiling 1 part of the drug with 16 parts of water (8 parts for dry drugs) until the quantity is reduced to one-fourth of its bulk.

**5.Digestion**

This process is similar to decoction process but continued for a much longer time. It is called pachana.

**6. Hot Extraction**

In this process, the drug is made into a pulp and wrapped inside the leaves of jambolan or palasha. The leaves are sealed with a thick layer of clay which are then roasted into fire of cow-dung cakes until the upper layer of clay turns brick red in colour. The clay and the leaves are removed, and the partially dried pulp is expressed out for juice. Thus, hot extraction or putapaka process is an extraction process by a unique method of roasting.

**7. Soft Extract**

It is a process of concentration of the decoction until an extract of soft consistency (avalcha) is obtained.

**8. Milk decoction**

It is prepared by boiling 1 part of the drug with 8 parts of milk and 32 parts of water till the water evaporates. Milk decoction is called kshirapaka.

**9.Medicated Oils and Clarified Butter**

These oily, liquid preparations are prepared by digesting the drugs or their juices or decoctions with oil or ghee.

**10.Spiritous Fermentation**

This process is employed for the preparation of alcohol of varying degrees of strength. The powdered drugs or their decoctions are fermented in water or honey or kept in earthen pots for a long time. The fermented mixture is then clarified by straining through a muslin cloth. If decoction of the drug is used, then the fermented liquor obtained is called arista and if powdered drug is used then the preparation is called asava. Different kinds wines(suras)are prepared by distillation of asavas and aristas.

**11.Acetous Fermentation**

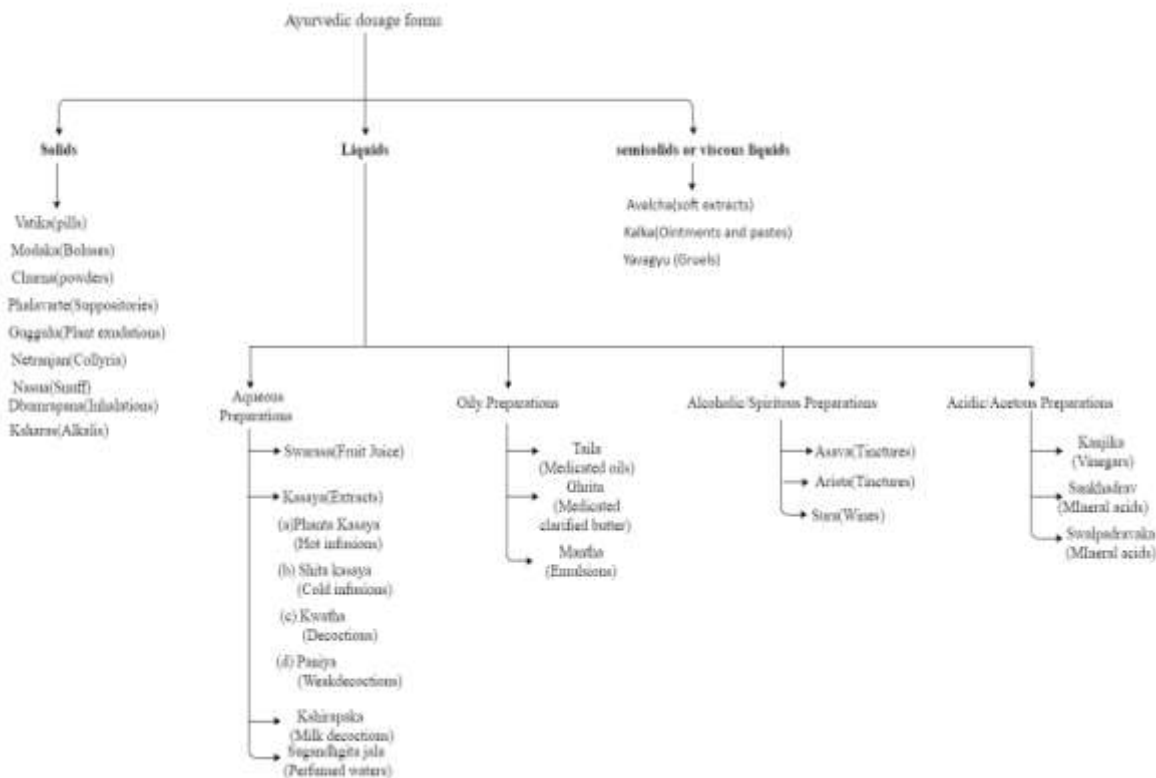
This method is used for the preparation of kanjika (vinegar).1 part of paddy is steeped in 4 parts of water and set aside for a formight in an earthen pot. The clear, transparent liquid is strained through a muslin cloth and preserved as vinegar. Kanjika is used as such or as a vehicle in other preparations. It can also be used as menstrum for the extraction of drugs.

**12.Confection (Kandapaka) Making**

It is the process of digesting powdered drugs with syrup till the right consistency is obtained. Required quantity of honey is added at the end. Sugar syrup can be prepared by dissolving it in water or milk or in some drug decoction.

**Classification of Ayurveda Dosage Forms**

The various Ayurvedic dosage forms recognized in the Ayurvedic Formulary of India are as follows,



### III. CHURNA

It is an ultrafine powder of drug or drugs.

#### Method of Preparation

The drugs prescribed in the formula (patha) are cleaned and dried properly, each drug is powdered separately and sieved through mechanical sifters or hand sieves of about 80 mesh size. The required proportion of each powdered drug is weighed accurately and then mixed. The finer the powder, the better is its therapeutic value due to better absorption[5]. Churnas when stored properly protected from moisture retain their potency for one year. Churnas are one of the most popular herbal mixtures in Ayurveda due to the following advantages,

- 1.Churnas are highly beneficial in improving digestion and other digestive problems.
- 2.They act as laxatives and hence are useful in treating constipation.
- 3.They enhance blood circulation throughout the body and treat hypertension, liver disorders and other stress-induced disorders.
- 4.Additionally, they protect the body against bacteria, viruses, mutagens, and carcinogens. The

only disadvantage of these preparations is their taste. Churna of bitter drugs are difficult to swallow because of their abnoxious taste since taste masking cannot be done. Also, they absorb moisture and form lumps hence should be stored carefully in air-tight containers. E.g: Narayana churna, Eladi churna, Sitopaladi churna.

### IV. AVALCHA (LEBYA)

It is a semisolid Ayurvedic dosage form prepared by adding jaggery,sugar or sugar-candy (mishri) to the prescribed drug juice or decoction and then boiling it until the mixture becomes a party mass. It is also known as guida, madaca, lcha, khanda, rasayana etc.

#### Method of Preparation

The essential components in the preparation of avalchas are,

- 1.Kasaya or swasa or any other liquids.
- 2.Jaggery, sugar-candy or sugar
- 3.Powders or pulps of the prescribed drugs
- 4.Ghee or oil
- 5.Honey

Jaggery, sugar-candy or sugar is dissolved in a liquid vehicle and strained through a muslim

cloth to remove the foreign particles. The paka or syrup is prepared by boiling the solution over a moderate fire until it attains one thread consistency (should form a sticky thread when pressed between two fingers) or if it sinks in water without getting easily dissolved.

The powders or pulps of the prescribed drugs are then added in small quantities and stirred continuously and vigorously until a homogenous mixture is formed. Ghee or oil is added if required while the preparation is still hot and mixed thoroughly. Finally, honey is added when the preparation is cool and mixed well. The colour and smell of avalcha depends on the drugs used.

The consistency of avalcha should neither be too dense nor too viscous. When rolled between the fingers, it should form a pill without sticking. Avalehas should be stored in glass or porcelain jars. They should be used within one year. Growth of fungus indicates deterioration.

E.g: Draksavaleha, Kutjavaleha, Suranavaleha [6].

## V. TAILA

Tailas are viscous oily preparations in which tail (fixed oil) is boiled with the prescribed kasayas and kalkas of drugs according to the formula. This process ensures absorption of the active therapeutic constituents of the ingredients used.

### Method of Preparation

The three essential components required for the preparation of medicated oils are, Kalka: Fine paste of the recommended drug(s) Drava-dravaiga: A liquid which may be one or more as swarasa, Kasaya, dugdha, mastu etc.

Sncha dravya : Taila or ghrita (ghee).

1 part drava-dravaiga are taken. The kalka and drava are mixed together, sncha is added and the mixture is boiled. The mixture is continuously stirred to avoid kalka sticking to the vessel. When all the drava-dravyas get evaporate and the mixture in the kalka begins to evaporate, the mixture is stirred vigorously and carefully so that it does not adhere to the bottom of the vessel. The consistency of the kalka is checked from time to time to know the condition and stage of the paka. If considerable quantity of milk is added to the preparations, the oil becomes thick due to formation of ghrita.

The consistency, colour, taste and smell of tailas depend on the drugs used. Tailas may condense in cold season hence should be warmed before use.

E.gs: Narayana taila, Bhringaraja taila, Pinda taila.

## VI. BHASMA

Bhasmas are powdered Ayurvedic preparations of metals, minerals, marine and animal products prepared by the process of calcination.

### 6.1. Method of Preparation

Bhasmas are prepared in two stages,

#### Stage I

The first stage is the purification process called sodhana, which is of two types.

1. Samanya Sodhana: This process is applicable to a large number of metals and mineral agents. Thin sheets of metals are heated and immersed in taila, gomutra, takra etc., for removing the toxicity.

2. Visesa Sodhana: This process is performed over certain drugs and for certain preparations.

#### Stage II

This stage is called marana. The purified drug is grounded in a khalva (mortar and pestle) with juices of the specified herbs or kasayas of the drugs recommended for a particular mineral or metal for a specified period of time. Small cakes or cakrikas are made from the grounded material. These are placed in a single layer in a shallow earthen plate (sarava) and closed with another plate. The edges of the plates are sealed with a clay-smear cloth in seven consecutive layers and dried well under sunlight.

A pit is dug in an open space and is half-filled with cow dung cakes (putas). The sealed sarava is placed in the pit and the remaining space is filled with more judas. Fire is lighted from all the sides and in the middle of the pit and allowed to burn for a specified time. When the burning is complete, the sarava is allowed to cool completely. The seal is opened, and the contents are taken out. The medicine is again made into a fine powder by grinding in a khalva. This process of triturating with the juices or kasayas, making cakrikas and giving putas is repeated as many times as prescribed in the yoga.

Bhasmas are stored in air-tight glass or earthen containers. They maintain their potency indefinitely. These are generally black, grey, dark white, yellowish or reddish in colour depending upon the drugs used in the process of marana. They are usually tasteless.

E.gs: Abhraka bhasma, Tamra bhasma, Svarna bhasma.

## VII. ASAVAS

Asava is the spiritous liquor obtained by the fermentation of powdered drugs in a solution of sugar or jaggery for a specified period. During the fermentation process, alcohol is produced which



facilitates the extraction of active principles present in the drugs. The alcohol produced also serves as a preservative.

### 7.1. Method of Preparation

Jaggery or sugar is dissolved in the required quantity of water, boiled, and cooled. The syrup is transferred into a fermentation vessel. Fine powder of the prescribed drugs is added into the fermentation vessel, covered with a lid and the edges are sealed with clay-smear cloth wound in seven consecutive layers. The container is kept in a special room or underground cellar or in a heap of paddy to provide a constant temperature to facilitate the fermentation process (sandhana).

After a specified period, the lid is removed, and the contents are examined to check the fermented liquor. The liquid is decanted and allowed to stand for two to three days. When the fine suspended particles settle down, it is strained and bottled.

The product should be free of froth and should not become sour (cukra). When stored in well-stoppered bottles or jars, they maintain potency indefinitely. These preparations have characteristic aromatic alcoholic odour.

E.g.s: Arvindasava, Kumaryasava, Vasakasava.

## VIII. ARISTA

Similar to asava, arista is also spiritous fermentation product but prepared from kasaya instead of powdered drug.

### 8.1. Method of preparation

The drugs mentioned in the yoga are coarsely powdered and kasaya is prepared. The decoction is strained and transferred into a fermentation vessel. Required quantity of jaggery, sugar or honey is dissolved, boiled and added. The vessel is sealed by wounding a clay-meared cloth in seven consecutive layers. The vessel is left for fermentation like for asava. After the specified period, the liquor is decanted and allowed to stand for two to three days following which it is strained and bottled. Like asava, arista also possesses a characteristic aromatic alcoholic odour and maintains potency indefinitely, if stored in well-closed containers. The preparation should not turn sour or produce froth on the top.

E.g.s: Khadirarista, Balarista, Vidangarista.

## IX. UNANI SYSTEM OF MEDICINE

The theory and practice of Unani medicine is also referred to as Tibb-c-Unani, Greek medicine, Arab medicine, Greco-Arab medicine,

Islamic medicine and Oriental medicine. It is a natural process of treatment originated in Greece (Unani in Arabic) during the times of the legendary Greek philosopher-physician Hippocrates or Buqarat (460-377 BC). This system of medicine had evolved in Greece, since the Greeks had accumulated a great wealth of knowledge on maintaining health by freeing medicine from the shackles of superstitious beliefs and magic. A great number of Greek philosophers, scholars and physicians like Galen or Jalinous (131-210 BC), Aristotle (384-322 BC) improved and expanded the scope of the existing medical knowledge based on experiment evidences.

From Greece, Rome and Iran, Unani medicine spread its roots to the Arab world where almost all of the Greek, Roman and Latin medical and scientific works were translated into Arabic by the great Arab scholars of that time. Rhazes (850-925 AD), Abdul Quasim Zahrawi (946 AD) and lion Sina (980-1037 AD) were the legendary Arab physicians who imbibed the best from the contemporary systems of traditional medicines in Egypt, Syria, Persia, Iraq, China and other middle Eastern countries and further refined the concepts of Unani medicine from a clinical point of view and developed surgery to high sophistication.

Thus, Unani medicine shaped into a complete and unique system of medicine during its reign in the Arab world. It was introduced into India during the 14<sup>th</sup> century by the Arab scholars who fled from Persia following invasion by Mongols. Under the patronage of the Mughal emperors, the Arab physicians were inducted as state employers and court physicians. With time, the Unani medicine gained popularity among the Indians and it soon succeeded in establishing a strong hold in the country which continued even after the downfall of the Mughal empire. Like any other form of medicine, the Unani medicine aims to find the best possible ways by which a person can lead a healthy life. This discipline is based on two theories.

The Hippocratic theory of four humours (akhlat) according to which the human body contains four humours-blood (dum), phlegm (balgam), yellow bile (safra) and black bile (sauda). As long as these humours are present in the right proportions, a person remains healthy otherwise disease sets in. Most of the unani physicians (Hakims) believe that these humours play an important role in the creation of human temperament (mizaj). If each human being has a

unique humoral constitution, then the people can be categorized under four basic temperaments-sanguine, bilious, phlegmatic and melancholic.

The Pythagorean theory of four elements (arkan) viz, earth (khak), fire (aatish), air (bad), water (aab). These are the constituents of matter from which all the universal animate and inanimate things are produced. These arkans represent the four qualities of the states of living human body i.e, hot, (nar), cold (barid), moist (ratab) and dry (yabis).

A perfect balance of arkan, mizaj and akhlat helps to keep the body and mind healthy so that the metabolic processes can take place easily and the body waste be evacuated. Tibb-e-Unani also maintains the view that the human body is composed of seven natural principles or components known as Umur-e-Tibbia that include, Arkan or anasir (Elements)

Mizaj (Temperament)

Akhlat (Humours)

Aaza (Organs)

Arwah (Vital spirit)

Quwa (Power)

Afaal (Functions)

They believed that these principles constitute the body and its health. The loss of any of these components may lead to diseased conditions or even death.

The logic of maintaining a good health and keeping the diseases at bay is based on the concept of hygiene or Hifzan-e-sehat. It emphasizes on keeping food, water, and air free from pollution. By using clean and fresh water, breathing clean and fresh air and consuming clean and fresh food, diseases can be prevented. It also lays down the six essential prerequisites for the prevention of diseases and to maintain health.

These essentials known as Arab-e-sittab-zaruriah are air, food and drinks, sleep and wakefulness, excretion and retention, physical activity and rest, mental activity, and rest.

Unani medicine emphasizes on retaining the natural compounds of the body and hence prescribe drugs which are natural in their sources and forms.

Diagnosis of the disease is done based on three important aspects, pulse (nabz), urine (boul) and stool (baraz) [15-16].

## X. SIDDHA SYSTEM OF MEDICINE

The Siddha system of medicine is associated with prevedic period based on the

Dravidian culture and is largely therapeutic in nature. The term Siddha means achievement and Siddhars were saintly people who attained excellence in medicine through practice of bhakti and yoga. Traditionally, it is believed that this system of medicine descended from Lord Shiva who revealed the knowledge of medicine to his wife Parvati who in turn passed it to Siddhars.

Siddha is extensively practised in Tamil Nadu and in the neighbouring Tamil speaking parts. The literature relating to it of which there are at least 500 texts and more than 3000 formulae are mostly in Tamil initially written on palm leaves. It is one of the oldest medical system of India that existed from the early times. It is also called the Agasthyar system after its famous exponent saint Agasthya.

Like Ayurveda, this system of medicine believes in the role of tridoshas-vatham, pitham and karpam and that all objects in the universe including human body is made up of five basic elements (the panchamahabhutas) viz munn (earth), vayu (air), neer (water), aakasam (space or sky) and thee (fire) in different combinations.

The tissues are called dhatus which are seven in number: Rasa (lymph), Kurudhi (blood), Tasai (muscle), Kozhuppu (adipose tissue), Majjai (marrow), Elambu (bone), Sukkilam and artavam (male and female hormones). Unlike Ayurveda, Siddha lays important on usage of metals and minerals rather than herbs. Herbs are used only to triturate and calcinate the metals into their bhasma and sindooram forms.

Since this system of medicine believes in the concept of panchamahabhutas, the medicine meant for the human body are prepared from the five dhatus or metals like gold, lead, copper, zinc and iron after proper detoxification. Gold and lead are used for the maintenance of the body, iron and zinc for the extension of life and copper for the preservation of heat in the body.

A Siddhar approaches the medical problem in terms of the three-elemental theory. Thus, while considering the causative factors and treatment of disease, he gives more attention to the disorders of the elements of the intrinsic factors of the body than to the extrinsic factors. Identification of the causative factors of the diseases is done through pulse reading, urine and tangu examination, colour of the body, study of voice, status of digestive system etc.

The Materia Medica of Siddha science contains drugs from vegetable, mineral, metal and

marine sources. A few drugs of animal origin are also under frequent use. Examples of few natural drugs used in Siddha system of medicine are, Ratha polam (*Aloe barbadensis*), Gomathaic (*Datura stramonium*). Ethis (*Strychnos nuxvomica*), Abini (*Papaver somniferum*), gold, silver, copper, iron, tin, lead, mercury, sulphur, pearls, diamonds, jade, coral, ruby, emerald, opal, sapphire, lapiz-lazuli, valkrantham, rajavantham etc [12-14].

### XI. HOMEOPATHIC SYSTEM OF MEDICINE

Homeopathy system of medicine was found by a German physician and chemist Dr. Christian Frederick Samuel Hahnemann (1755-1843). The experimental and practical foundation for homeopathy was carried out between 1790 to 1810. Hahnemann believed that symptoms are not manifestation of the illness itself but an outward reflection of the body's defence mechanism to overcome the illness. He further stated that the medicines given for treatment should produce these symptoms instead of antagonizing them [17]. In 1790, he observed that real cures were affected by drugs which reinforce similar symptoms in healthy human subjects. Homeopathy is therefore based on the Law of Cure: *Similia: similibus curantur* which translates to "like are cured by like". This is the single most belief and foundation of homeopathic practice, which derives its name from the Greek words *homois* (like) and *pathos* (treatment).

With the concept of Law of similar in mind, Dr. Hanemann set about examining the effects produced by ingestion of various extracts. He started with cinchoma and to his surprise found that it produced symptoms similar to malaria. These symptoms persisted as long as the treatment was continued. With the help of his colleagues and friends, he examined the effects of a wide range of plant, animal and mineral extracts and succeeded in getting relevant results which were published in the definitive text of homeopathy *The Organon of Medicine*.

In contrast to other alternative therapies, in homeopathy, the drug treatment is not specified but the choice of drug depends on the individual and his symptoms rather than the clinical condition of the patient. By administering a drug that is tailored to the symptoms and complaints specific to each patient, the homeopathy encourages the body's intrinsic healing process. Drug tailoring is based on the concept of proving and prover. The process of administering doses of an extract in a healthy

individual (called prover) to assess the symptoms it induces is called as proving.

The prover specifically maintains a record of the physical, mental and emotional changes induced by various doses of the extract over a period of time. Consequently, this builds up a drug picture of an extract which is compared precisely to similar symptoms produced by an illness in a patient.

For example, one patient suffering from depression may feel tired and listless (lack of energy) while another may feel agitated and irritable. Based on different symptoms shown by different patients to the same clinical conditions, different remedies would be tailored. Similarly, different conditions presenting similar symptoms can be treated with the same remedy. For example, treatment for inflammation due to a burn and due to a skin rash is designed to fit the patient's symptoms but not the aetiology [17].

During the treatment it was found that the drug extracts at normal doses aggravated the symptoms for which they were used. This led to the second feature of homeopathy-potentization, according to which the more the drug is diluted or potentized, the greater is its curative effect.

The mother tincture which is prepared by macerating the fresh drug in pure alcohol is diluted according to various scales of serial dilutions to increase the healing power of the drug. Centesimal scale involves a serial dilution of 1 in 100 and decimal scale involves dilution series of 1 to 10. One drop of mother tincture when added to 99 drops of an inert solvent (like water, alcohol or lactose) gives the first centesimal potency denoted by IC.

The solution is then shaken vigorously and tapped on a resilient surface, a process called succussion, an important part of the preparation of a homeopathic drug that claims to release the power to heal. Further dilution of 1 drop of IC to 99 drops of solvent and succussed produces the second centesimal, the process can be repeated up to 10,000 C (10M). Alternatively, 1 drop diluted to 9 parts gives the first decimal potency denoted by 1 D or 1 X. Such extreme dilutions have led to strict precautions so as to avoid contamination of the potency. The preparations should not be stored near pungent materials like perfumes, soaps and toothpastes as any strong odour will negate the potency [17].

## XII. CHINESE SYSTEM OF MEDICINE

### 12.1. Introduction

Traditional Chinese Medicine (TCM) originated in ancient China about 2500 years ago. The TCM practitioners uses various techniques like acupuncture, medicinal herbs etc., to promote health and/or treat diseases. The basis on which these practitioners work has been listed below. The human body represents a miniature version of the larger, surrounding universe. A person is considered to be healthy when harmony exists between two opposing yet complementary forces i.e, Yin (Passive) and Yang (active). On the other hand, diseases or illness results due to a breakdown in the equilibrium between these two forces. Enormous functions in maintaining health are performed by Qi (a vital energy that flows through the body) [1].

### 12.2 Yin and Yung Theory

Yin and Yung theory is the mostly accepted theory on which the TCM are based upon. As already discussed, Yin and Yung are opposing yet complementary forces whom harmony helps to maintain health whereas imbalance between these causes diseases [14].

#### 12.2.1. Cause of Disease

According to TCM, disease or an ailment is caused due to any imbalance in the body, especially due to excess of Yin and deficiency of Yang or vice-versa. For instance, a person may experience cold due to excess of Yin (an external factor) whereas Yung (endogenous factors in the body) may cause fever.

#### 12.2.2 Disease prevention

One of the main functions of TCM practitioners is to keep their patients healthy and strong. Over the centuries, they have learned to do this by advising their patients to stay away from alcohol, avoid smoking, minimize stress in their lives, do regular exercises etc.

#### 12.2.3. Treatment

Today, the priority of most of the modern medicine practitioners is to keep their patients alive by managing the symptoms of the diseases rather than curing the underlying cause.

For instance, hypercholesterolaemia, diabetes, hypertension etc., are usually managed with drugs like statins, pioglitazone, and calcium channel blockers respectively. These drugs although are able to cure the symptoms, but during the rest of the patient's life have proved to cause

muscle toxicity (by certain statins), congestive cardiac failure and kidney cancer (by pioglitazone) and bradycardia (by certain calcium channel blockers).

In contrast to modern medicine practitioners, the TCM practitioner's approach is pragmatic, experimental and is based on the techniques that can help the patient to get back to productive life. For instance, a person effected with stroke will be treated for up to 6 months with proper mixtures of plant medicines to achieve adequate balance in the body. This is a very tough job as each disease in each person requires an individualized therapy. Besides plant extracts, Tai Qi, yoga, prayers, meditation etc., are also included in the therapy to maintain the balance of Yin and Yang (to support health), treat the underlying cause of the disease and prevent is progression.

### Techniques

To restore the harmony between Yin and Yang, the TCM practitioner may use one or more of the following several methods.

#### Acupuncture

Acupuncture involves a group of procedures/techniques that stimulate the specific points on the body. The commonly practised acupuncture technique involves penetrating the thin, solid metal needles into the superficial skin, subcutaneous tissue and muscles and manipulating by hand or electrical stimulation. There exists about 2000 acupuncture points on the human body that are interconnected by 12 main meridians or channels. It is through these channels, that the Qi (energy) flows between the skin surface and its internal organs. Hence acupuncture helps to maintain a balance between Yin and Yang, thereby allowing for the normal flow of QI throughout the body to restore health to mind and body.

### Chinese Herbs

Thousands of medicinal plant/herbs find a mention in the Chinese Medica (a standard reference book). The commonly used parts of the herbs include leaves, roots, stems, flowers, and seeds. In TCM herbology treatment, the herbs are combined into a formula that is dispensed as tears, capsules, powders, liquid extracts, granules etc.

Every herb used has its own energy, flavour, movements in the body as well as its related meridians to which it is connected to. Usually four types of energies have been found in herbs i.e, cold, cool, warm, and hot. Herbs possessing first two types of energies are used in

the treatment of fever, thirst, sore throat etc. whereas the latter two energy possessing herbs are used to treat cold, pains and similar other conditions.

Five types of flavours in herbs include sweet, salt, sour, bitter and pungent, sweet herbs are used to nourish deficiencies, reduce toxicities, relieve pain and slow down the progression of acute diseases. Salt herbs finds use in the treatment of severe constipation and swelling due to goitre, sour herbs are good at stopping leucorrhoea, seminal emission, diarrhoea and perspiration. Bitter herbs are used in the treatment of fever, hot sensations and damp diseases. Pungent herbs are good at promoting circulation of blood and Qi at promoting perspiration.

After administration of herbs they undergo absorption and then move in one of the four directions.

Upward towards the head. Such herbs are used for falling symptoms like prolapsed organs. Downwards towards the stomach. Such herbs are used for up-surgings symptoms like coughing and vomiting. Inward towards the digestive organs. Such herbs are used to induce bowel movements and promote digestion. Outwards towards the superficial body regions. Such herbs are used to treat superficial symptoms that travel towards the internal organs.

Every herb used in TCM has its own meridian or meridians to which it will correspond to. For instance, the herbs used in the treatment of respiratory tract disorders move towards lungs and hence can be used to treat cough or asthma.

### Maxibustion

This theory involves burning of moxa (roots of dried *Artemisia vulgaris*). The smoke and the pungent Adour produced due to burning of moxa is used to warm up blood, strengthen the kidney (Yang), stimulate the flow of Qi, dissolve stagnation, disperse cold and expel wind.

### Tui Na Body Therapy

This therapy includes message, acupressure and acupuncture. The TCM practitioner may use herbal compresses, ointments and heat to enhance this therapy. It is commonly used to treat chronic pains related to skeletomuscular system.

All the important phenomena taking place in human body for example, changes occurring during different stages of life, functioning of body, changes during diseased conditions etc., are explained by the five elements i.e, fire, earth, wood, metal, and water [14].

### XIII. CONCLUSION

Pharmacognosy is a scientific discipline, which is primarily concerned with the study of crude drugs obtained from natural sources, such as plants, animals, and minerals. It has also led to the development of novel drugs and nutraceuticals. Traditional systems of medicine also referred to as complementary, supporting or assisting medicine are not part of the standard conventional medicine but are the ones that are used along with or instead of the standard care provided by doctors or allied health professionals such as nurses, pharmacists, physical therapists. Traditional medicine has been prevalent in various countries like India and China much before the development of present-day medical science. For example, in India ,Ayurveda, meditation, yoga, Unani herbal medicine and siddha have been used since ancient period to heal the body. The complementary and traditional medicine practitioners take a holistic approach to patient care. They treat the patient as a whole person but not just a set of symptoms. They tend to be strongly prevention oriented and regard a high value to the body's natural ability to heal itself. Still now-a-days many people are turning gradually towards traditional therapies as these are safe, have no side effects, expenses are reasonable, and these are equally effective in the treatment of patients with diseases which the conventional medicine cannot cure.

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