The system has developed a rich and unique treasure of drug knowledge in which use of metals and minerals is very much advocated. Some idea about the depth of knowledge the system possesses in the field of mineral, materia medica can be formed from the detailed drug classification, briefly described below: There are 25 varieties of water-soluble inorganic compounds called '*Uppu*'. These are different types of alkalies and salts. There are 64 varieties of mineral drugs that do not dissolve in water but emit, vapours when put in fire. Thirty-two of these are natural and remaining are artificial. There are seven drugs that do not dissolve in water but emit vapour on heating.

The system has classified separately classes of metals and alloys, which melt when, heated and solidifies on cooling. These include items like gold, silver, copper, tin, lead and iron. These are incinerated by special processes and used in medicine. There is a group of drugs that exhibit sublimation on heating and includes mercury and its different forms like red sulphide of mercury, mercuric chloride and red oxide of mercury etc. Sulphur, which is insoluble in water, finds a crucial place in Siddha materia medica along with mercury for use in therapeutics and in maintenance of health.

The above classification shows detailed knowledge and study of minerals that this system has evolved for treatment. In addition there are drugs obtained from animal sources. The system has published an hand-book on Siddha treatment for common diseases and ailments.

In Siddha system chemistry had been found well developed into a science auxillary to medicine and alchemy. It was found useful in the preparation of medicine as well as in transmutation of basic metals into gold. The knowledge of plants and mineral were of very high order and they were fully acquainted with almost all the branches of science. The Siddhars were also aware of several alchemical operations divided into several processes such as – calcinations, sublimation, distillation, fusion, separation conjunction or combination, congelation, cibation, fermentation, exaltation i.e. the action or process of refining gold, fixation i.e. bringing to the condition of being non-volatile i.e. to the state of resisting the action of fire, purification, incineration of metals, liquifaction, extraction and so on. Even cupellation of gold and silver which is an essential process in Alchemy, claimed to have been discovered by the Arabs, was known to the Siddhars long long before. They were even polypharmacists and as such were engaged in boiling, dissolving, precipitating and coagulating chemical substances. Some of their secret methods, especially those in fixing and consolidating certain volatile substances that could not resist the action of fire, such as Mercury, Sulphur, Orpiment, Vermilion, Arsenic etc. continue still a mystery.

The Siddha system is capable of treating all types of disease other than emergency cases. In general this system is effective in treating all types of skin problems particularly psoriasis, STD, urinary tract infections, diseases of liver and gastro intestinal tract, general debility, postpartum anaemia, diarrhoea and general fevers in addition to arthritis and allergic disorders.

Diagnosis and Treatment

The diagnosis of diseases involve identifying it causes. Identification of causative factors is through the examination of pulse, urine, eyes, study of voice, colour of body, tongue and the status of the digestive system. The system has worked out detailed procedure of urine examination which includes study of its colour, smell, density, quantity and oil drop spreading pattern. Holistically the diagnosis

3

Indigenous Traditional Drugs

PUNARNAVA

Synonyms: Eng: Hog Weed; Sansk: gophaghni, gothaghni; Assam: Ranga Punarnabha; Beng: Rakta punarnava; Guj: Dholisaturdi, Motosatodo; Hindi: Punarnava; Kan: Sanadika, Kommeberu, Komma; Mal: Chuvanna Tazhutawn; Mar: Ghetuli, Vasuchimuli, Satodimula, Punarnava, Khaparkhuti; Ori: Lalapuiruni, Nalipuruni; Punj: Khattan; Tam: Mukurattai, Shihappu; Tel: Atikamamidi, Erra galijeru.

Biological source: Punarnava (Rakta) consists of fresh as well as dried whole plant of *Boerhaavia diffusa* Linn.

Family: Nyctaginaceae.

Habitat: The plant is a weed found throughout India and Srilanka during rainy season.

Macroscopic characters: Stem is greenish purple in colour, slender, stiff, cylindrical, swollen at nodes, minutely pubscent or nearly glabrous.

Roots are long, cylindrical, 0.2–1.5 cm. in diameter; Yellowish brown to brown in colour, longitudinal striations and root scars on surface; short fracture, odourless and bitter in taste.

Leaves are opposite, larger ones 2.5–3.5 cm long and smaller ones, 1.2–1.8 cm long, ovate-oblong, apex rounded or slightly pointed, base subcordate, glabrous on upper, entire margin.

Flowers are very small and pink in colour

Fruits are 6 mm long, rounded with one seed

Microscopic Characters: Stem: T.S shows epidermal layer containing multicellular uni seriate glandular trichomes consisting of 9–12 cells, cortex consists of 1–2 layers of parenchyma; endodermis indistinct; 1–2 layered pericycle, isolated fibres; small vascular bundles joined together in a ring and many big vascular bundles scattered in the ground tissue, cambium is also present.

Roots: Cork is composed of thinwalled elongated cells with brown walls in the outer few layers. Cork cambium consists of 1–2 layers of thinwalled cells. Cortex composed of 5–12 layers of thinwalled polygonal cells; central regions of root occupied by primary vascular bundles; numerous raphides of calcium oxalate crystals are present. Simple starch grains and fibres are abundant in cortex region.

containing of rosette type of calcium oxlate crystals. In the midrib it has 4–5 layered collenchyma just below the upper epidermis and 2–3 layered above the lower. Vascular bundle is present in the middle of the midrib, and the remaining is filled with parenchyma cells with calcium oxalate crystals.

Chemical constituents: The drug mainly contains triterpenoid saponins possessing oleanolic acid as aglycone, ecdysterone (harmone), alcohols and a large percentage of alkaline ash containing potash.

Uses: The drug is abortifacient, antiasthmatic and hypoglycemic. It is also used for stomach ache, bowel complaints, piles, boils, skin eruptions, diarrhea, dysentery, cough, bites of poisonous insects, wasps, bees, etc.

LAHSUN

Synonyms: Eng: Garlic; Sansk: Rasona, Yavanesta; Assam: Maharu; Beng: Lasun; Guj: Lasan, Lassun; Hindi: Lahasun; Kan: Balluci; Mal: Velluli, Nelluthulli; Mar: Lasun; Punj: Lasan; Tam: Vellaipondu; Tel: Velluli, Tellapya, Tellagadda; Urdu: Lahsan, Seer.

Biological source: It consists of bulb of *Allium sativum* Linn.

Family: Liliaceae

Geographical Source: Europe, Central Asia, USA and India.

History: Garlic is mentioned in the Bible and the Talmud. Hippocrates, Galen, Pliny the Elder, and Dioscorides all mention the use of garlic for a large number of conditions, including parasites, respiratory problems, poor digestion, and low energy. Its use in China was first mentioned in A.D. 510. Louis Pasteur confirmed the antibacterial action of garlic in 1858.

Cultivation and collection: The plant Succeeds in most soils but prefers a sunny position in a moist light well-drained soil. Dislikes very acid soils. It tolerates a pH in the range 4.5 to 8.3. The bulb is liable to rot if grown in a wet soil. The cloves are planted in late autumn for an early summer crop. They can also be planted in late winter to early spring though yields may not be so good. The cloves are planted with their noses just below the soil surface. If the bulbs are left in the ground all year, they will often produce tender young leaves in the winter. Bulb formation occurs in response to increasing daylength and temperature. It is also influenced by the temperature at which the cloves were stored prior to planting. Cool storage at temperatures between 0 and 10°C will hasten subsequent bulb formation, storage at above 25°C will delay or prevent bulb formation. The bulbs are harvested after 4 months.

Macroscopic Characters: It is a small plant. The leaves are green, slender, flat and elongated. The stem is smooth and solid. The bulbs are composed of several bulbils (cloves), enclosed in white skin of the parent bulb. The inflorescence is an umbel initially enclosed in a spathe.

Drug occurs either as entire bulb or isolated cloves; bulb is subglobular, 4–6 cm in diameter and consists of 8–20 cloves. The bulb is surrounded by 3–5 whitish papery membranous scales. cloves are irregular, ovoid, tapering at upper end with dorsal convex surface, 2–3 cm long, 0.5–0.8 cm wide, each cloves surrounded by two very thin papery whitish and brittle scales. Odour is characteristic and aromatic. Aromatic and pungent in taste

4

Ayurvedic Dosage Forms and Their Evaluation Methods

Ayurveda means the 'science of life'. Since ancient times a variety of pharmaceutical dosage forms have been used in Ayurvedic system of medicine and some of them are in practice even today. For obtaining maximum therapeutic benefit and making recipe palatable, different pharmaceutical processes are prescribed in ayurveda, called "Aushadhana kalpna" (Medicinal formulations), which are prepared for the convenience of administration through various routes in different forms for the different disease condition. These processes not only help in the isolation of the therapeutically active parts of the drugs, but also, easily administrable, palatable, digestable, therapeutically more tolerable and more preservable.

Ayurvedic dosage forms (formulations) can be grouped into four types depending upon their physical nature

(A) Solid dosage forms, e.g., vatika, gutika, guggulu

(B) Semisolid dosage forms, e.g., kalka, aveleha

(C) Liquid dosage forms, e.g., asava, arista, swarasa, taila

(D) Powder dosage forms e.g., churna.

All the ayurvedic preparations consist of two words. The **first** word may indicate either the disease for which the preparation is used (**Jwarantaka** vati), or the property of the preparation (**Kaameshwara** modaka), or the drug contained (**Arjuna** arishta), or the name of some god or saint (**Narayana** taila) and the **second** word always indicates the type of preparation (Jwarantaka **vati,** Kameshwara **modaka,** Arjuna **arishta,** Narayana **taila**).

ASAVA AND ARISHTA

Asavas and Aristas are medicinal preparations processed by soaking the drugs either in powder form or in the form of decoction (Known as kasaya), in a solution of sugar or jaggery, for a specified period of time.

Preparation: For the preparation of Asava, required amount of jaggery or sugar is dissolved in the required quantity of water, boiled and cooled. Then this solution is poured into the vessel where fermentation takes place and fine powdered drugs and Dhataki are added in the container containing the jaggery or sugar solution. The mouth of this vessel is covered with an earthern lid and the edges