CHAPTER 1

Introduction and Review of Literature
INTRODUCTION

Nature always stands as a golden mark to exemplify the outstanding phenomenon of symbiosis. The biotic and abiotic elements of nature are all interdependent. The plants are indispensable to man for his life. Plant has been used for defense, protection and nourishment by human being with the dawn of civilization. The three important necessities of life-food, clothing and shelter- and a host of other useful products are supplied to him by the plant kingdom. Nature has provided a complete store-house of remedies to cure all ailments of mankind. The knowledge of drugs has accumulated over thousands of years as a result of man's inquisitive nature, so that today we possess many effective means of ensuring health-care.

Medicinal plants are the national heritage with global importance. Our country is endowed with a rich wealth of biodiversity. India is one of the worlds 12 regions having the largest biodiversity. 70% of India's medicinal plants are found in tropical areas, mostly in various forest types spread across the Western and Eastern ghats, the Vindhyas, Chottanagpur plateau, Aravalis and Himalayas. Although less than 30% of the medicinal plants are found in the temperate and alpine areas and higher altitudes, they include species of high medicinal value.

India is said to be the paradise of herbs in the world, India has every possible agro-climatic zone from the highest of Himalayas, down to the sea level, from the dry arid desert of Rajasthan, to the wettest place in the world in Cherrapunjee, from the oldest part of Gondwanaland in the South, to the rich alluvium plains in the North. Thus all varieties of herbs, spices and aromatic plants can find suitable soil and environmental condition.
The plants have originated before human beings according to ancient script. The idea that plant could be used for treating disease and healing wounds probably arose in the mind of early man and they used plant parts and their crude extract to help them in need, sorrows and sickness without the scientific knowledge of their composition.

Medicinal plants have curative properties and are used for medicinal and personal hygiene. Herbal System of Medicines such as: Ayurveda, Unani and Siddha are emerging and they are of great demand in the country. Treatment under Ayurvedic system of medicine involves not merely medication but also prescribes a code of conduct (AHAR VIHAR), which brings people nearer to the nature. The use of plants for curing various human ailments figured in ancient manuscripts as the Rigveda and the Bible. In the early ages, man used raw drugs isolated or obtained from the plants lead one to infer about the interrelationship between primitive men and medicinal plants. From a very long time, plants have been used traditionally as medicine by aboriginal people. In 19th century, a good number of workers compiled literature regarding the traditional uses of plants by primitive human societies.

According to the World Health Organization, more than 4 billion people rely on herbal medicines to some extent. It is a large part of the total population and therefore, a larger number of medicinal plants are required and used by it. It has also been estimated that about 25 per cent of all preparation drugs are based on plant-derived medicines. The WHO has listed almost 21,000 plant species that have reported medicinal uses around the world, and the global demand of medicinal and aromatic plants are growing at the rate of 7 per cent per year.
The systematic study of Indian medicinal plants was started by Chakravarty (1975). In recent years much work in this science has been done in a number of countries such as USA, UK, China, France, Mexico, India etc.

Potentially, every plant occurring on this planet has one or more medicinal properties. An increasing number of investigation have been attracting attention to the vast stored knowledge about the properties and uses of plants, still existing in nature cultures in several parts of country. But without paying attention on traditional and ecological aspects between men and his surrounding plants, it is not possible to conserve these plants forever along with their medicinal properties. Exploitation can be sustained through the ecological studies of all species along with their rational uses. Through the conservation of plants, man can preserve several species as botanical curiosities, useful to him and thus ensure their survival. Like other organisms plants or plant communities, germinate, grow, become mature and ultimately die. Majority of life processes i.e., reproduction, growth and yield of plants are governed by various habitat factor such as, climate physiography and biotic influences etc. Vegetation plays a key role in the structural configuration of nature and it can be managed either for physical and recreational benefits, they confer; or for productive purposes. Plants exercise a moderating influence on air, water, temperature and other various factors. Besides altering the physical and chemical properties of soil, they play an important role in checking floods, drought, erosion and vagaries of nature. Several factors such as soil, rainfall, altitude, light and method of cultivation etc. play a major role for economical success of large-scale cultivation of plants. Numerous activities of man influence the growth and production of plants.
The use of plants is as old as humanity. A large number of plant products are used in India. India's flora in very rich from medicinal point of view. Rural and tribal people of our country are very well aware about the plant properties and their utilization for food, medicine and various other uses. Many workers have studied different aspects of phytochemistry of medicinal plants. Stansky and Wilson (1967) studied the effect of soil moisture and texture on root/shoot weight of transplanted pine seedling. Kirtikar and Basu (1975) gave the properties of medicinal plants.

Plant has always been a common source of medicament either in the form of traditional preparations or pure active principle. In a survey done by WHO it has been estimated that 80% of more than 4,000 million inhabitants of the world rely chiefly on traditional medicines for their primary health care needs and it can safely be presumed that a major part of traditional therapy involves the use of plant extract on their active principles (Farnsworth et. al., 1985). There are at least 120 distinct chemical substances derived from plants that can be considered as important drugs. (Farnsworth et. al., 1985).

Medicinal plants are of great interest as pharmaceutical industry depends in part on plants for the production of secondary compound. Medicinal and aromatic plants constituents great economic and strategic value for Asia and pacific.

Phytomedicines are potential for health care programme of developing and underdeveloped countries because they are available at low cost, comparatively safe and people have faith in them over synthetic drug molecules, which require million dollar research and years for their development. Major obstacle in the modernization of phytomedicine is the lack of standardization to completely evaluate the
purity, quality, potency, safety and efficacy of these natural remedies, because they contain a number of phytochemicals in single herb or herb combinations.

Higher plants as source of medicinal compounds continue to play a dominant role in maintenance of human health since antiquities. Over 50% of all modern clinical drugs are of natural product origin (Suffness and Douros 1982), and natural products play an important role in drug development programs of the pharmaceutical industry (Baker et. al., 1995). In developing countries in rural contexts people usually turn to traditional healers when in diseased conditions and plants of ethnobotanical origin are often presented for use.

Investigation into the chemical and biological activities of plants during the past two centuries have yielded compounds for the development of modern synthetic organic chemistry and the emergence of medicinal chemistry as a major route for the discovery of novel and more effective therapeutic agents (Roja and Rau 2000).

During our frequent excursions in the past few years to the nearby tropical dry deciduous forests of the area, it was observed that, a number of important medicinal plants species of forest were use to be found abundantly. Year after year we noticed that many important medicinal plant species have become rarer and some of them are difficult to locate in the forest now.

The objective of the present study is to focus on the ecological condition, growth behaviour and phytochemical constituents on certain medicinally important plants i.e. Aloe vera (Linn.), Andrographis paniculata (Nees.), Chlorophytum borivilianum (Sant. and Fernandez) and Gymnema sylvestris (R. Br.).
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Introduction and Review of Literature

In view of the above-mentioned background the present work has been focused mainly on the regeneration studies through seeds/other propagules under different environmental conditions.

Ecological and phytochemical studies are conducted by following methods.

1. Selection of study site.
2. Field survey for collection of plants, seeds and propagules.
3. Method for raising the plants.
4. Soil for the growth plants.
6. Seed viability and regeneration studies under different condition.
7. Phytochemical studies on proposed plant species were done to ascertain the active chemical principle present in them by standard phytochemical method.
REVIEW OF LITERATURE

Mankind has used plants as a source of drug for centuries. The ancient man was totally dependent on plants to fulfill his day-to-day requirement for food, shelters, clothing and medicament. He had his own ways of selection and use of the medicinal and economic plant species through trial and error methods and had derived almost all his medicinal products from the plants. His method of using these plants and their products in medicine was very natural and not destructive to the nature. He discovered a large number of plant species useful in ancient traditional systems of medicine.

Plants have been an integral part of traditional medicine across the continent since time immemorial. Medieval period literature on medicine was called "herbals". "Ban-taso" was an early Chinese herbal period during 1250 A.D. Several drugs being used in modern medicine have figured in ancient manuscripts such as The Rigved, The Bible and the History of Herodotus. Over 6000 years ago, the ancient Chinese were the first to use the natural vegetation as medicine.

Although all plants have medicinal value but only those plants whose medicinal value have actually been established or used in any system of medicine are termed as medicinal plants. A complete understanding of medicinal plants involves a number of disciplines including commerce, botany, horticulture, chemistry, enzymology, genetics, quality control and pharmacology. The World Health Organization (WHO) estimates that up to 80 per cent of the world population rely on plants for their primary health care. Western pharmaceutical are often expensive, inaccessible or unsuitable. Global interest in medicinal plants especially in the western countries has increased recently. The international medicinal plants market is worth US dollar 60 billion per year, and growing at the rate of 7 per cent per annum (Bhojvaid 2003).
India's ancient culture contained a veritable mine of health care with outstanding information about medicinal plants. Ayurveda, the oldest recorded system of medicine in India is concerned with the principles of health and attaining long healthy life 'Charak-Shamhita' the oldest medicinal treaties of the country is a veritable storehouse of medicinal plants.

Indian medicinal plants have drawn the attention of scientists from all over the world. Our various drugs have come accidentally through the work of travellers, explorers and missionaries etc. The further evaluation of these drugs are made by botanists, chemists and ethnobotanists engaged in their own research to find out new drugs. The role of natural products in the development of drug is necessity for further research in folklore use of single plant or their formulation in medicine. Chemistry has a vital role in improving the material life of people at large. The role of phytochemistry in medicine is a fascinating application of scientific knowledge in the well-being of mankind. Screening of medicinal herb has become a potential source of biodynamic compounds of therapeutic values in phytochemical researches.

From literature, it is found that natural constituents isolated from plant material used in oriental folk medicine have provided the medicinal value and industrial stimulus. It is likely that still other substances with more significant and valuable pharmacological properties could be isolated from plants and that incidentally clues to some of these may be found in the folk medicine of primitive man. There is ample proof for the application of crude plant extracts and decoction in their preparation by world over as well as in India. But the aboriginals' rationalization of the science of the therapeutics as we know is comparatively of recent origin. Chemical investigation along with pharmacological examination of the chemical constituents from plants of medicinal values has gained much importance in the therapeutic world. The primitive man used raw materials and raw
extracts of plants to alleviate sickness and ailments without the scientific knowledge of their active ingredients.

The knowledge of medicinal plants is known from historical ages. The systematic study of medicinal plants was started in later part of 17th century and early part of 18th century.

Compilation on Indian medicinal plants started in the early 19th century. The earliest contributions are Dutta’s “Meteria Medica of Hindus” (1877), Daymok’s (1883) “Vegetational Materia Medica of Western India” and contribution by Khory (1887) and Dey (1896) are valuable works relating to the medicinal products indigenous to India.

The important contribution on Indian medicinal plants in 20th century include, Important medicinal plant by Kritikar and Basu (1918), Indian Materia Medica (Nandkarni 1926), Indigenous drugs of India (Chopra 1933), Bhartiya Banaushadhi (Biswas and Ghosh 1950), a Review of Indian Medicinal Plants (Chopra, Nayar and Chopra 1956) and Indigenous Drugs of India (Chopra and Handa 1958) and Sarmah (1968-69) has listed about 248 botanical drugs from Atharavaveda and Rigveda itself.

As early as (1976) Satyavati has worked on medicinal plants of India, cultivation and utilization of Medicinal Plant (Jain 1985) and a large number of research papers added to the wealth of literature on Indian Medicinal Plants. Jain and De Flippets (1991) have briefly described about 1850 species of Indian Medicinal Plants.


Borthakur (1993) has reported thirteen native plant remedies for child disease and 21 for women disease present among the different groups of Assam. The virgin field of Psychoactive plant research by Schultes (1993), Brahman and Saxena (1990), Oommachan and Masih (1991), Park (1993) and a large numbers of research papers have added to the wealth of literature on Indian medicinal plants.

Medicinal plants used by Kondh tribe of district Phulbani(Orissa) local name (Duskaranta) locality, G. Udaygiri in 1992, the paper enumerates 40 plants used for making colours utilized in Mithila paintings, 10 plant extracts added as fixatives to the colours and 14 plants symbolishing fertility, potency, good omen and reverence to deities in these paintings. Studies on medicinal plant wealth of Similipal Biosphere Reserve, Mayurbhanj District have been carried out by (Pandey and Rout 2001, Pandey et. al., 2002). Some parts dealing with ethnobotany of Mayurbhanj have been published by Saxena et. al., (1988) and Pandey and Rout (2004).

A very useful contribution has been made on ‘India’s Threatened wildlife and Medicinal plants’ by Chaudhuri and Sarkar (2002). Singh and Prakash (2003) have introduced about the indigenous knowledge of useful threatened plant species, ethnic diversity of tribals of the states of Uttar Pradesh and Uttaranchal through Indian Medical Science Series No.131 entitled ‘Tribal wisdom on Medicinal and Economic Plants’. Medicinal plants used in biological system are mentioned in ‘Medical Botany’ (Lewis and Lewis 2003).

Medicinal plants are an integral part of the diverse traditional medicinal practices in the Himalayan region and are highly valued both in folk medicine and in codified traditional medical systems such as Chinese traditional medicine and Ayurveda (Sivarajan and Balachandran, 1994 and Lama et. al., 2001).

Very few studies have approached the issue of management of Himalayan MPs with reference to knowledge and practices of local people (e.g. Lama et. al., 2001, Ojha et. al., 2001 and Larser, 2002).

The exploitation of medicinal plants is expanding rapidly due to the development of medicinal plant industries, both regionally and internationally. Research on medicinal plants traded from Nepal shows that the Nepalese Himalaya contributes a significant amount of high value medicinal plants in the region, especially those species that have become very rare in the Indian Himalaya (Olsen and Larsen 2003). The cultural and social control of high-altitudes medicinal plants has been studied for communities living inside the Nepal programme (Aumeeruddy-Thomas and Lama 2004) and variation of market trend of medicinal plants, as well as social strategies developed by commercial collectors, have been analyzed in the context of a larger interdisciplinary project (Lama et. al., 2001) jointly implemented since 1997 by the WWF-UNESCO people and plants initiative and by the WWF Nepal program.

In the recent past much information is made available on the enumeration and folk uses of medicinal plants of different regions of India

Naik (1973) has stressed the need to improve economy of tribals through the use of natural resource available to them. Medicinal plants constitute one such resource, which could be readily tapped, as forest source of income in tribal dominated pockets of India (Joshi 1982).

As mentioned earlier the number of medicinal plants in India, both indigenous and introduced, has been variously put at between 3,000 to 3,500 species of higher plants. The Glossary of Indian medicinal plants has listed around 3,000 plants (Chopra 1956, 1974 and Asolkar 1992). The Ayurvedic Drug formulary prepared by Department of Indian Systems of Medicine, lists 387 plants (Sarin 1996). Sixteen medicinal plants of exotic origin, introduced in India from time to time, are under cultivation and are now considered a part of the Indian medicinal plant resources. Notable among these are, *Seena, Psyllium, Belladonna, Cinchona, Eucalyptus, Ipecac, Digitalis* and *Maxican dioscorea*, while a number of medicinal plants are occurring in wild in forest. These include *Ephedra gerradiana, Saussurea costus, Podophyllum hexandrum, Taxus baccata, T. wallichiana, Aquilloria malaccensis, Valeriana jatamansi, Strychnos nuxvomica, Terminalia chebula, Rauwolfia serpentina* and various species of *Berberis* (Sarin 2003).

Bhattarcharjee (2000) has described nomenclature, distribution, cultivation, processing, and chemical properties of 560 medicinal plants from all over the world. Maheshwari (2000) has compiled a number of research reports on ethnobotanical studies on folklore medicinal plants of Indian subcontinent. Herbal medicine standardization, are discussed by Kamboj (2000). Medicinal plants of
India their distribution, resources and ethanobotanical uses of medicinal plants have been given by Joshi (2000).

Acharaya Deepak (2004) studied the medicinal plants for curing common ailments in India. Studies on medicinal plants were also done by Cal (2004). Dwivedi (2004) studied unnurtured and untapped super sweet nonsacchariferous plant species in India, which also included the studies on Abrus precatorius.

It is well known that traditional herbal medicine existed before the application of the modern scientific method to health care and even today majority of the world population depends on herbal health care practices Exploring traditional herbal medicines in the context of modern science is the need for optimum and proper utilization of traditional plant drugs. About the progress of medicinal plant it can be said that there is no end of medicines and natural medicine is obtained from the medicinal plant which are further called as herbal product. Therefore we can say that there is no end or saturation of the medicinal plant.

HERBAL SYSTEMS OF MEDICINE

Ayurveda

Ayurveda originated in India long back in pre-vedic period. Rgveda and Atharva-veda (5000 years B.C.), the earliest documented ancient Indian knowledge have references on health and diseases. Ayurveda texts such as Charak Samhita and Sushruta Samhita were documented about 1000 years B.C. Ayurveda has made up two Sanskrit words : Ayu which means life and Veda which means the knowledge of. The term Ayurveda means ‘Science of Life’. It deals
elaborately with measures for healthful living during the entire span of life and its various phases. Besides, dealing with principles for maintenance of health, it has also developed a wide range of therapeutic measures to combat illness. These principles of positive health and therapeutic measures relate to physical, mental, social and spiritual welfare of human beings. Thus Ayurveda becomes one of the oldest systems of health care dealing with both the preventive and curative aspects of life in a most comprehensive way and presents a close similarity to the WHO's concept of health propounded in the modern era.

A perusal of its several classical treatises indicates presence of two schools of Physicians and Surgeons and eight specialties. These eight disciplines are generally called "Ashtanga Ayurveda" and are:

1. Internal Medicine (Kaya Chikitsa)
2. Surgery (Shalya)
3. ENT and Ophthalmology (Shalakya)
4. Pediatrics (Kaumar Bhritya)
5. Psychiatry (Bhoot Vidya)
6. Toxicology (Agad Tantra)
7. Geriatrics (Rasayana)
8. Eugenics and aphrodisiacs (Vajikarana)

Ayurveda has developed its own theoretical framework to understand the structure and properties of all material things based on the theory of Pancha Mahabhutas (the five primordial elements) which analyses all the constituents of the universe based on the sensory
organs that are employed to detect them. They have a theoretical framework based on the three doshas namely Vatha, Pitta, and Kapha to understand health and disease. The Ayurvedic Materia Medica lists the properties of literally thousands of plants as well as hundreds of animals and mineral products based on Ayurvedic concepts.

Ayurvedic idea is that the organism adapts to the environment and its food, climate etc. This principle of adaptation is called Satyama. Though introducing in small number of a germ, the organism can adapt to it and learn to resist it. Ayurveda became increasingly symptom-based, treating the symptoms of a disease rather than the root cause. It is important to note that Ayurveda was originally a consciousness based system of health care. Its philosophy, expressed in modern terms, is to strengthen the immune system.

In Ayurveda diagnosis is always done of the patient as a whole. The physician takes a careful note of the patient’s internal physiological characteristics and mental disposition. He also studies such other factors as the affected bodily tissues, humour, the site at which the disease is located, patient’s resistance and vitality, his daily routine, dietary habits, the gravity of clinical conditions, condition of digestion and details of personal, social, economic and environmental situation of the patient. The diagnosis also involves the following examinations:

1. General physical examination
2. Pulse examination
3. Urine examination
4. Examination of the faces
5. Examination of tongue and eyes
6. Examination of skin and ear including tactile and auditory functions.

Treatment of the disease consists in removal of causative factors responsible for disequilibria of the body matrix or of any of its constituent parts through the use of Panchkarma procedures, medicines, suitable diet, activity and regimen for restoring the balance and strengthening the body mechanisms to prevent or minimize future occurrence of the disease. Use of these three measures is done in two ways. In one approach of treatment the three measures antagonize the disease by counteracting the etiological factors and various manifestations of the disease. In the second approach the same three measures of medicine; diet and activity are targeted to exert effects similar to the etiological factors and manifestations of the disease process.

Ayurveda has developed a very vivid analytical description of the stages and events that take place since the causative factors commence to operate till the final manifestation of disease. This gives this system an additional advantage of knowing that possible onset of disease much before the latent symptoms become apparent. This very much enhances the preventive role of this system of medicine by making it possible to take proper and effective steps in advance, to arrest further progress in pathogenesis or to take suitable therapeutic measures to curb the disease in its earliest stage of onset.

Systematic research in Ayurveda under the patronage of Government of India started in 1969 with the establishment of Central Council for Research in Indian Medicine and Homoeopathy. In the year 1978 CCRIMH was spilt into four separate councils one each for Ayurveda and Siddha, Unani medicine, Yoga and Naturopathy and
Homoeopathy. The central Council for Research in Ayurveda and Siddha (CCRAS), an autonomous organisation under Ministry of Health and Family Welfare, Govt. of India is engaged in developing independent and multi-dimensional research into various fundamental and applied aspects of Ayurveda.

**Siddha**

Siddha system is one of the oldest systems of medicine in India. Siddha system literature is in Tamil and it is practiced in Tamil speaking parts of India. Its principles and doctrines, both fundamental and applied, have a close similarity to Ayurveda, with specialization in Iatrochemistry. Like Ayurveda, this system believes that all objects in the universe including human body are composed of five basic elements namely, earth, water, fire, air and sky. The food, which the human body takes and the drugs it uses are all, made of these five elements. The proportion of the elements present in the drugs vary and their preponderance or otherwise is responsible for certain actions and therapeutic results.

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.

Siddha is one of the ancient medical systems of the world. It was founded by Siddhars (Saints) who were highly talented scientists and who perfectly understood the human mind and body during health and illness from embryonic life to death. The founders who were known as Siddhas, lived in various parts of India. Government of India has set up a pharmacopoeia committee for Siddha system of Medicine for
preparing official Formularies/Pharmacopoeias with a view to prescribe working standard for preparation of drugs and to prescribe working standard for compound formulation including test for identifying purity and quality of the drugs and to prescribe working standard for compound formulation including test for identifying purity and quality of the drugs. Central Council for Indian Medicine, constituted under IAACC Act 1970, regulates the education of Siddha system and central council for research in Ayurveda and Siddha was established in 1978 with a view to initiate, under taken and regulate the research work in Siddha system of Medicine also.

Unani

The Unani system of medicine is one of the oldest and most acceptable systems of medicine practiced in India and all over the world. Its main emphasis is promotion and prevention of health through cure of diseases. Unani Medicine is both very old and very modern. Hippocrates practised it over 2400 years ago. His medicine however included a great deal of ancient Egyptian medicine as well as important components of the ancient Mesopotamian traditions. In the Middle East and in the Asian Subcontinent, Unani Medicine continues to serve millions of people as their only or main traditional medicine. Further, as modern medicine also originated from the ancient Greek traditions, new scientific concepts can readily be integrated into its practises. Thus Unani Medicine is both an ancient medicine and the traditional medicine of the future. The first physician of the system was asclepedeus who learnt the principles of medicine from Hazrat Idrees. Another renowned physician was Galen who played a major role in propagation of the system far and wide.

Hippocrates put forward the humoural theory, which formed the basic framework of this system of medicine. His era marked the
beginning of the Golden period of the Unani system of medicine. He also initiated the concept of hospital and built the first hospital of the world in Hamas (Egypt) after travelling around the globe to find a suitable place. A few Important texts of the system include Kitab-ul-Hashaish (1st Century B.C) Kamil-Us-Sana (10th century A.D.), Canon of Medicine (11th century A.D), Umoor-e-Tabiyyah (Basic Elements of Life).

The Unani System of medicine is based on the Humoural Theory. According to these theory there are four humours in the body i.e. Dam (Blood), Balgham (Phlegm), Safra (Yellow Bile) and Sauda (Black bile). These are generated in liver by the nutrient components of the ingested food and liquids. There is a strong relationship between a body fluid and its associated humour so any imbalance in a humour will also cause changes in the composition and properties of its associated body fluid. Health is a state of body in which all the humours are in equilibrium and in accordance with their own temperament and the environment. Any alteration in the equilibrium leads to disease.

Unani medicine has given great importance to the prevention of the disease than cure. There is an influence of surroundings and ecological conditions on health of human being. There are six factors, which are essential for the maintenance of good health called Asbab-e-Sittah Zaruriah. These essentials are as follows:

1. Air (Hawa)
2. Food and Drinks (Makool-o-Mashroob)
3. Body movement and Repose (Harkat-va-Sukoon-e-Badania)
4. Mental movement and Repose (Harkat-va-Sukoon-e-Nafsania)
5. Sleep and Wakefulness (Naum-o-Yaqzah)
6. Retention and Evacuation (Ehtibas-o-Istafraagh)
Firstly, the practitioner takes a full case history. This will have many aspects, but generally includes observation of the patient, e.g., observing a patients posture and listening to their voice, observing the tongue and its coating, the eyes, the hands (skin colour, etc.) and the finger nails. It also almost always involves taking the pulse (Nabz), which often takes a little time, as the practitioner does not just take the pulse rate, but also looks for subtle changes in the pulse that may indicate present or threatening health conditions. In addition, the practitioner may press reflexes and examine the urine (Baul) and stool (Baraz) of the patient. The physician also takes into account the daily routine of the patient.

In Unani system of medicine, treatment is based on temperament and humour. In diseased condition, there are imbalance in body temperament and humour. Therefore, Unani physicians laid down the principles for the correction of temperament and humour. Every humour has a specific temperament as described earlier e.g. hot, wet, cold, and dry. So, the drug used for the treatment should posses an opposite temperament than that of diseased humour, resulting in normalization of temperament. A disease, which is cold in nature, can be cured by a drug, which has hot temperament.

The Central Council for Research in Unani Medicine (CCRUM) an autonomous organisation under the Ministry of Health and Family Welfare, Government of India engaged in developing independent and multi dimensional research into various fundamental and applied aspects of Unani system of medicine. The CCRUM gained name and fame for the successful treatment in Leucoderma during its thirty years of research.

To conclude, all Indian system of medicine use naturally available part and products of plants, animals and mineral to achieve a common aim of promotion of health, prevention and cure of disease.