CHAPTER-I

INTRODUCTION
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According to the World Health Organization (WHO), as much as 80% of the world’s population relies on traditional medicine. The World Health Organization (WHO), has defined herbal medicines as “finished labeled medicinal products that contain as active ingredients, aerial or underground parts of plants, or other plant material or combinations thereof, whether in the crude state or as plant preparations”. Primarily, the population of developing countries is using herbal medicines for primary health care. They have stood the test of time for their safety, efficacy, cultural acceptability and lesser side effects. The chemical constituents present in them are a part of the physiological function of living flora and hence they are believed to have better compatibility with the human body (Rajasekharan 2002).

The health problems that plague modern society are well known in the medical world, but the rapid strides are being made in current pharmacology is barely able to keep pace with them and even the vast range of drugs available are often far from satisfactory. Underlying the praises heaped upon such products for their efficacy is a more cautious note of warning. This propaganda, voiced in a low key, invites the consumer to turn to more natural alternative medicines, many of which were once widely used, but have long since been abandoned in favour of progress.

As a result of this new trend, a large number of people who are perhaps septical or apprehensive about conventional drugs have now turned in to alternative treatments and in particular treatments that make use of medicinal plants. They are quite willing to place their trust in the competence of herbalists, amateurs or professionals, who often have no formal medical background whatsoever. In their attempt to achieve good health by ‘natural’
means, they are tempted by expensive little packets of attractively wrapped and cleverly advertised herbs claiming to cure every type of complaint.

The plant world is an immense storehouse of active chemical compounds. Nearly half the medicines we use today are herbal in origin, and quarter contains plant extracts or active chemicals taken directly from plants (Anonymous 2003).

It has been estimated that out of about 2000 drugs that have been used in curing human ailments in India, only about 200 are of animal origin and a similar number are of mineral origin. The rest, i.e. about 1500, are of plant origin (Jain 1968).

**Herbal Medicine**

**The antiquity of herbal medicine:**

The earliest record shows that the evidence of use of herbs in Indian, Chinese, Greek, Roman and Syrian texts dates back to about 5000 years. The classical Indian texts include Rig Veda, Atharva Veda, Charaka Samhita and Sushruta Samhita. The herbal medicines/traditional medicines have therefore, been derived from rich traditions or ancient civilizations and scientific heritage. This had come to the present generations through oral traditions (Rajasekharan 2002).

**Global Scenario**

**Greek Medicine:** The history of Greek medicine and pharmacy begins from Hippocrates (borne in 460 B.C.), father of medicine, who in his writings named nearly 400 ‘samples’ as medicinal substances. Theophratus (370-285 B.C.) in his work *De Historia Plantarum* mentioned about 500 drugs. The Dioscorides, who flourished about 60 A.D., is said to have become a surgeon in Nero’s Army so that he would be able to study the flora and fauna of different countries. In his life, he traveled Italy, Greece, Asia Minor, Spain
and France and collected a great number of botanical specimens. Whenever circumstances permitted, he questioned the natives about the medicinal virtues and uses of the specimens he gathered. His work *Materia medica* was published in 1499, which contains a lot of information on various drugs. Important among are: Acacia, Aconite, Brine, Aloes, Oil, Starch, Dill, Anise, Bitter almond, Juniper, Rose oil, root, licorice, wine, betumin, worm wood, Lichens, hemlock mint, Elaterium, Vinegar lettuce, Cardamom, Cumin and alcoholic extract of root of Mandrake and Poppy as a soporific in surgery. Later, this book was translated into Arabic and some European languages. Pliny, the Elder (A.D. 23-79) in his work *Historia Naturalis* described medicines derived from plants. Galen, born in 130 A.D., is said to have kept a pharmacy for a time in Rome and he derived so many preparations of vegetable drugs, which were called ‘galenicals’. He advised his readers “in order to know drugs, inspect them not once or twice but frequently, though twins look alike to strangers, they are easily distinguished by friends”. His works were also translated into Arabic languages, (Kaushik & Dhiman 1999).

**Egyptian Medicine:** *Ebers Papyrus* is believed to be written about 1500 B.C., which contains a collection of preparations and formulae covering a wide range of uses. The important drugs mentioned in it includes oil, wine, beer, yeast, vinegar, turpentine, figs, castor oil, myrrh, mastic, frankincense, worm wood, aloes, opium, cumin, peppermint, anise, fennel, saffron, lotus, linseed, juniper fruits, henbane, mandragora, poppy, gentian, colchicum, squill, cedar, elder berries, honey, grapes, onion, garlic, acacia and date blossoms, (Kaushik & Dhiman 1999).

**Assyrian and Babylonians Medicine:** In the library of Sardanapalus at Ashurbanipal which dates back from 650 BC have been found clay tablets belonging to Assyrians and Babylonians, relating to medical and
pharmaceutical subjects. Their list of drug posses 250 herbs, of which important one include cassia, cinnamon, costus, orris root, anise, jasmine, oleander, allamander, cathartica, mint, henbane, liquorices, alcohol, fats, oil, wax, turpentine and alum, (Kaushik & Dhiman 1999).

**Chinese medicine:** Pun taso, a pharmacopoeia like compilation consisting of volume contains several thousand prescriptions. The origin is attributed to the mythical god of medicine believed to have flourished about 2735 B.C. About 265 drugs have been mentioned in this herbal work of which 240 are vegetable substances. In the 1st century AD, the herbal treatise Shen Nong recorded over 250 medicinal plants and also listed their temperature and taste. The combinations of these two factors determine the healing potential of each plant (Anonymous 2003).

**Arabian medicine:** After the decline of Galen medicine in Rome, the work of earlier Greeks physician were forsaken and work of Galen gradually assumed the position of greatest authority in medicine. Greek medicine found its votaries among Arabs who caused as much of literature as possible could be found translated into Arabic. The followings are the famous workers.

Rhazes (Abu Bakar Mohammad Bin Zakaria Razi), who died in 932 A.D., had written nearly 250 works some of which were devoted to pharmaceutical subjects. His famous work was *Alhavi Kabeer*, and Garrison credited him with Hippocrates in his influence upon medicine. Avicenna (Sheikh Bu Ali Seena) known among Unani physicians as Skeikh (980-1033 A.D.) was the founder of Graeco-Arabic school of medicine and wrote ‘canons’ the second volume in which they described 719 drugs.

Sharif (Al Idrisi) (1100-1166 A.H.) who was born in Sevta along with his associates Rashiduddin Suri toured the hills and forests of his country Syria in search of medicinal plants. The reference of his work is found in
Alaquaqir of Ibn-Baitar, which has described 1400 drugs and has given the reference of more than 150 Arab and Syrian physicians who had been concerned with the collection of the information about these drugs.

The Arab physicians on the medicinal properties of the plants have made important contributions. Ziauddeen, Abu Mohamed Abdullah ibn-i-Ahmed-al-Maliki (1197-1241 A.D.), chief botanist in the court of Egypt, wrote monumental work *Jameul- Mufradat* that deals with 2000 drugs, of which 1700 are herbs. Abul farj-ibn-al-qof (A.H.630-685) and Yusuf bin Omar Saheb-ul-Yemen (died 694 A.H.) contributed the Arabic medicine by writing *Tabaquat-ul-Atibba* and *Almotamad* respectively. Besides, Sheikh Dawood of Antakia wrote a book in 1008 A.H. on medicine named *Tadhkirat-ul-Albab* described several hundred herbs besides drugs of animal and mineral origin, (Kaushik & Dhiman 1999).

Outstanding among the large ranks of the humanists was Ermolao Barbo who sought to give uniformity to the wide variety of terms and names used in the old writings and to establish parallel areas with the ancient texts thus permitting a more comprehensive view of the whole subject. In this work *Castigations Plinianae* (Revision of the works of Pliny), he corrected a number of points and clarified a system of nomenclature that was no longer understood, while at the same time corrected of other errors and repetitions. Although he brought nothing that was scientifically new to the text, he shed a great deal of light on a subject that, with the passing of time, had become unintelligible.

His criticism of nomenclature was accompanied by criticism of the current fashion for foreign plants. Imported exotic plants were no longer passively accepted as panaceas and credence was not automatically given to claims of miraculous remedies. Instead, attempts were made to find local plants with similar properties in the conviction that there was still a great deal to be discovered. A new discipline in research into medicinal herbs was thus
introduced (confirmed by the founding of various university chairs, most notably those of Bologna and Padua in Italy).

At the same time herbaria were established and botanical gardens were also created where at last samples could be grown and studied on the spot. In due course, botanical gardens were established in almost all Italian Universities and also began to appear elsewhere in Europe. In Britain perhaps the largest and best-known gardens were founded in Edinburgh (1670) and near London at Kew (1759).

With the invention of printing in the 15th century, a great number of herbals were published. The sixteen, seventeen and eighteenth centuries were subsequently produced a wealth of information on the subject which was for the first time, became accessible to the public at large.

Another important development at this time was xylography (wood-engraving). Now plants could be recorded illustratively by means of prints. In Britain probably the English Botanist and surgeon, John Gerard, who also became superintendent of Lord Burglary’s gardens published the best-known herbal of this period, The General Historie of Plantes, in 1597. Gerard’s herbal was richly illustrated with examples of plants he had found growing in his London garden.

One name that stands out in the history of English herbalism is that of Nicholas Culpeper linked herbs with astrology, many of the medicinal claims he had made about the different plants tended to be fanciful, in contrast to the two works by Gerard and Parkinson. Nevertheless, his book was enjoyed a great popularity and today, Culpeper is almost a household name. By the sixteenth century a fundamental turning point had been reached in the history of medicinal herbs. With the advent of the Swiss-German physician and herbalist, Paracelsus (1439-1541), the whole scene was changed. His introduction of new methods and concepts saw the beginning of chemical
research, which was led to the development of synthetic product, (Chiej 1982).

National Scenario

Indian medicine:

The history of medicine in India can be traced to the remote past in the Vedic period. The *Rig Veda*, perhaps the oldest repositories of human knowledge having been written about 4500-1600 B.C., claims about 99 medicinal plants. *Yajur Veda* listed 82 plants. *Atharva Veda*, which is considered important among all four Vedas, deals with 288 plants (129 According to Dr. Udupa), almost all have medicinal ingredients and were used to cure deadly diseases. The later production from Vedas, the *Brahmans* deal with 129 plants and *Kalpa sutras* described about 519 plants. Those plants that had not been dealt in detail in the earlier works like the *Rig Veda*, *Atharva Veda* and *Brahmans* have been vividly described in later Sanskrit texts, like *Kalpa sutras*, (Kaushik & Dhiman 1999).

*Ayurveda*, the science of life is considered upveda (about 2500 B.C) contains a more detailed account of many drugs and their uses. *Ayurveda* in fact is the foundation stone of the ancient medical science and art of healing. The eight divisions of *Ayurveda* were followed by the comprehensive works of *Charaka* (1000 B.C) and of *Sushurata* (800 B.C) that gave a detailed description of the material as it was known to ancients. *Charkas samhita*, the first recorded treatise on the *Ayurveda* is the edited version of the old scientific treatise by Agnivesha who wrote the first treatise on Ayurvedic medicine based on teaching of Ayurveda from his preceptor, Atryega, the great sage, (Kaushik & Dhiman 1999).

The period from (800 B.C.) is considered as the golden era in the Indian system of medicine. Another, triad known as *Laghu trayi of Ayurveda* are the compilations by Madhavakar (12th century), who wrote
Madhavanidana, concerned mainly with diagnosis; Shangadhara (14th century), who wrote *Sharngadhara samita*, a systematic Ayurvedic materia medica and Acharya Bhava Mishra (15th century) a native of Benaras who wrote *Bhavapraksha* which contains more than 600 drugs including some of the foreign drugs. Besides a large number of *Nighantus* or pharmacy lexicons on the medicinal herbs were written.

The oldest *Nighantu* seems to be written by Deodas Kashiraj, the Raja of Benaras, who is also believed to be the incarnation of Dhanvantri. He is said to have taught his *Dhanvantri Samhita* to his pupils among whom Sushrutra was most renowned. He is also said to have written another book, known as *Raj nighantu* on drugs. In this book, about 400 herbs have been described and many other authors have drawn upon his source. Narhari Pandit, a native of Singhpur in Kashmir, wrote *Raj nighantu* or *Chauramani*. Madanpala wrote *Madanpalanighantu*; Lala Saligram, a native of Moradabad wrote *Saligram nighantu*, which dealt 1574 drugs, out of which some have been illustrated with the help of drawings.

It is interesting to mention that during Ayurvedic period the chemistry of natural products isolated both from flora and fauna was well understood at least for practical purposes. Nagarjuna is considered as a learned person in Hindu chemistry, was the inventor of kajli (a compound of sulphur and mercury) and art of calcination (Bhasma). He was not only a renowned Vaidya but was an authority on astronomy, chemistry and magic as well. Nagarjuna was born in a poor Brahmin family and he wrote ‘*Rasa ratnakara, Arogyomanjari* and *Kakshaputa*. *Bhoja prabandha*, a treatise written about 980 A.D., contains a reference to inhalation of medicaments before surgical operations and an anaesthetic called *Sammohini* is said to have been used during the time of Buddha.

From this period down to Mohammedan invasion in India, Hindu medicine was flourished. But after the period of the tantras and siddhas, the
glories of the Hindu medicine rapidly declined because during invasion of India by Mohammedans, no original work could be done and Hindu medicine gradually began to decay. The Buddhist doctrine of ahimsa had also influenced the work as no work could be done in surgery field as consequently the thinking of "study and practice of the healing art led to pollution" and "to touch the body is sinful", etc. influenced the work. However, Greeks, Scythians and Mohammedans invaded India successively and enriched their materia medica by coming in touches of Indian antiquity, (Kaushik & Dhiman 1999).

With the decline of Buddhism, degeneration was set in all round, i.e., in knowledge, learning and practice of both medicine and surgery and process of decay became advanced about the time of the Mohammedan invasion. This decline became more rapid because invaders brought their own healing system that was well advanced for that period and thus the Ayurvedic system of medicine got down rapidly. Then, Arabic system was introduced which became the state system of treatment of illness. Arabian medicines were prevalent during the reign of Pathan and Mughal dynasties but with the fall of Mughals, it was also decayed. During the intimate contact between the Hindu medicine and the Arabian medicine, which lasted for many years, intermingling occurred and each utilized the materia medica of the other. Due to which both systems had declined and a rich store of the combined materia medica was left behind. First the Portugese then French, European and lastly Englishers invaded India and decline was still further marked. Dr. Garcia da Orta, who came in India in 1534, perhaps was the earliest European to describe some Indian drugs. He was appointed medical adviser to the Portuguese Viceroy in 1554-55 and traveled over different parts of India and examined the plants growing there. He published a treaties on drugs used in Indian medicine in Dutch language in 1565 in Goa which was translated into English later on. Western system of medicine was introduced with the
invasion of British rule in India, which was appreciated and accepted by people due to its advanced technology especially due to its surgical achievements. They brought their own materia medica and there took place further intermingling and introduction of new medicinal plants into the country, (Kaushik & Dhiman 1999).

However, the very fact that the Indian system of Ayurvedic medicine survived all trials and tribulations through centuries bore enough to testimony to the efficacy of this indigenous system of medicine. Hence, the western scholars and medicinal practitioners could not ignore it. Sir William Jones perhaps was the earliest contributor who wrote a memoir *Botanical observation on selected plants*. This was followed by Flemmings (1810), who wrote *Catalogue of Indian medicinal plants and drugs*, Ainsile (1873), *Materia medica of Hindoostan*, Roxburgh (1832) *Flora indica* and Drury (1858) *Useful plants of India*, which was revised later in 1873. Waring (1868) was the first who brought out the *Pharmacopoeia of India* supplemented by Mohidden Sheriff (1869) and later by Dymock, Warden and Hooper (1890-93). It is a most careful and useful compilation containing a mass of information regarding the uses of the indigenous materia medica in the Eastern and Western medicine. Meanwhile Hooker (1872-97) explored the plant wealth of India and published a monumental work *Flora of British India* in seven volumes. Another document *viz.*, *The dictionary of economic products of India* was originally projected by J.N. Mukherji, but subsequently completed by Dr. George Watt, the reporter on economic products to the Government of India during 1889-1896. This work is considered most important as it not only incorporate the earlier work on the indigenous plants but also information on the new results on clinical trials by various medical authorities, besides cultivation and economic importance of many of them with reference to their inland and export trades are recorded. Later, works such as *Indigenous drugs of India* by Kanny Lal Dey (1896) and *Indian
medicinal plants by Kirtikar and Basu (1918), are largely summerized and compiled from the above-mentioned works. In the later, work illustrations have also been provided which greatly help the workers in differentiating the plants, which they are apt to be confused. Blatter et al. revised this, in 1933, (Kaushik & Dhiman 1999).

Meanwhile, Brandis (1906) published a monumental work Indian trees in which some information was provided on medicinal and other uses of plants. Besides, Nadkarni in 1908 wrote a treatise on Indian plants and drugs which later in 1927 was again published as Indian material medica and revised in 1954, provided information on 2671 medicinal plants. Earlier, Chopra (1933) started a project at Calcutta School of Tropical Medicine, Calcutta, which resulted in the publication of a useful and informative volume on Indigenous drugs of India, which was revised later in 1958 by the same author with his colleagues after independence.

After Independence, Council of Scientific and Industrial Research, New Delhi, during 1948-1976 published Wealth of India, which is considered an updated edition of Dr. Watt's work of the dictionary of economic products of India. Illustrations and plates that made it superior over previous work of Dr. Watts supplement. However, revision of the work has been launched to update the Wealth of India and four volumes have already been published. Vaish (1940) published Abhinav Booti Darpan, which was illustrated and is considered a landmark in the field of Ayurveda, (Kaushik & Dhiman 1999).

After Independence, Bhandari (1958) published Vanoushdhi Chandrodaya (an encyclopedia of Indian Botany and herbs), which in addition given information on important preparations made from the plants besides their medicinal uses. This has been revised and its new edition was published in 1993, given updated information in the medicinal field. Singh (1948) prepared a guidebook Vanoushdhi darshika for the students of botany and forestry and later on (1955), he surveyed the forests of Bihar and
published his work under the title *Bihar Ki vanaspatiyan*. Singh (1969) published *Vanoushdhi nirdeshika* (Ayurveda pharmacopoeia), which was revised later in 1983. This provided much information about the adulteration of the drugs including main preparations made from the plant products. In 1962, Government of India constituted Ayurveda committee with a view to maintain the uniform standards in the preparation of drugs and prescribed working standards for compound formulations including tests for identifying purity and quality of the drugs. Central Institute of Medicinal and Aromatic plants at Lucknow is also serving in this field. Pharmacopoeial Laboratory for Indian medicines established at Ghaziabad is serving as a centre for standard setting cum-drug testing laboratory for Indian medicines including Ayurveda, Siddha and Unani system of medicines. Under this centre, Amchi research unit has been set up also to carry out clinical researches and survey of local drug potentials of Tibetan system of medicine (Amchi system), which is in vogue in Ladadh, Lahul, Tawang and in some other regions. Similarly, Central council of Indian medicine was established for working in Ayurvedic, Siddha and Unani system of medicines. National Institute of Ayurveda was established in 1976 at Jaipur (Rajasthan) in collaboration with the Government of Rajasthan, which is working as a national centre for promoting Ayurveda.

Besides, Central Council for research in Ayurveda and Siddha was constituted in 1978 to develop and coordinate scientific research in different aspects of fundamental Ayurvedic and Siddha system of medicine. Institute of History of medicine and medical research, Delhi and Central Council for Research on Unani medicine established in 1979 are working for the coordination and scientific research in Unani Medicine which indirectly incorporate Ayurveda (Kaushik & Dhiman 1999).
Ayurvedic System of Medicine:

An ancient Indian healing system, Ayurveda is also called 'the science of living'. Following a methodical approach of diagnosis by eliciting the patient's family history, examining the entire body, categorizing the patient's temperament, analyzing his digestion and reading the pulse, the Ayurveda physician concludes which of the doshas (humors) is imbalanced. It then proceeds to strengthen the body's inherent ability to rejuvenate, heal and restore its natural balance. It stresses on removing the cause of disease rather than its symptoms, (Jaggi 1998).

Unani System of Medicine:

Unani system of medicine owes its origin to Greece. It was the Greek Philosopher-Physician Hippocrates (460-377BC) who freed medicine from the realm of superstition and magic and gave it the status of science. The theoretical framework of Unani medicine is based on the teachings of Hippocrates after a number of other Greek scholars enriched the system considerably. Of the Galen (131-210 AD) stands out as the one who stabilized its foundation on which Arab Physicians like Rhazes (850-925AD) and Avicenna (980-1037AD) constructed an imposing edifice. Imbibing what was best in the contemporary systems of traditional medicine in Egypt, Syria, Iraq, Persia, India, China and other Middle East and Far East countries enriched Unani medicine.

Development of Unani medicine:

In the 7th century, Mohammad, the prophet of God and his successors, the caliphs, created a vast Arabian empire, which within a century of the passing away of the prophet encompassed territories greater than those of any other earlier civilization.

On the borders of Persia, in the region of Asia minor, a small territory named Jundi-Shahpur, flourished as a center of Greek learning. It was here
that Nestorian Christians, Jews and other scholars practiced and taught Greek sciences and medicine. When the caliphs captured the area, they left it undisturbed. In fact, during the early expansion of their empire, summoned physicians from there, whenever medical aid was required.

After the Abbasids seized power in about A.D. 750, they made an organized attempt towards the pursuit of scientific learning. The procurement and translation of Greek and Indian medical texts and others was encouraged. Scholars in Iran and neighbouring countries embarked upon the translation of the best available writings in Syria, Greek, Persian, and Sanskrit. The practice of medicine now developed into an established profession.

Translation of Greek and other medical text into the Arabic language, and the new books written by pioneering non-Muslim scholars, coupled with the setting up of hospitals and medical libraries in the larger cities of Arab empire, ushered in an era when Muslim scholars stood poised to make original observations and innovations. The emergence of Muslim scholars, mostly Persian, took place between A.D. 900 to 1,100. The first and surely the greatest of the physicians and authors of this period was Al-Razi.

Al-Razi popularly known by medieval Latinists as Rhazes was probably the first physician known to have refused to surrender to the authority of galen's erroneous doctrines. As chief physician of a big hospital in Baghdad his fame spread far and wide. Combining all the knowledge available on diseases with his own observations he composed a lengthy manuscript, which posthumously appeared in the book form under the title of Al-Hawi. This was later translated into Latin (continence) and other European universities, influenced western medical thought.

The detail and accuracy of Al-Hawi in the recognizing different diseases, differentiating among similar-looking diseases, their classification and the methods adopted to treat them, makes Al-Hawi a highly regarded text.
even today. The treatise on small pox and measles contained the first
description of small pox as a clinical entity.

Another great physician was Ibn Sina, also known by his Latinised
name Avicenna (980-1037). A child prodigy, Ibn Sina was interested in many
fields of knowledge. In medicine, he was more interested in the theory rather
than the practice of medicine. His book Al-Qanun, was translated into Latin
( Canon), and studied in medieval European universities. It is still regarded in
India and Pakistan as the supreme authority on all matters connected with
Unani medicine. Rhazes and Avicenna were both of Persian origin but wrote
in Arabic.

Unani System of medicine in India: When Mongol horders under Chinghiz
Khan, Hulagu and Timur brought ruin to the flourishing Persian and Central
Asian cities, scholars and physicians from these regions were compelled to
flee to places where they felt comparatively safe and where they could
continue their creative activities. Since India had good relations with Persia
and the economic and political conditions therein were favourable. Many
physicians and scholars from Persian cities migrated to India.

In India, Arabs introduced Unani system of medicine and soon it took
firm roots in the soil. When Mongols ravaged Persian and central Asian cities
like Shiraz, Tabrez and Galan, scholars and physicians of Unani medicine fled
to India. The Delhi Sultan, the Khilijis, the Tughlaqs and the Mughal
Emperors provided state patronage to the scholars and even enrolled some as
state employees and court physicians. During the 13th and 17th century Unani
medicine had its hey-day in India. Among those who made valuable
contributions to this system into period where Abu Baker Bin Ali Usman
Ksahani, Sadruddin Damashqui, Bahwa Bin Khwas Khan, Ali Geelani, Akbal
Arzani and Mohammad Hashim Alvi Khan.
The scholars and physicians of Unani medicine who settled in India were not content with the known drugs. They subjected Indian drugs to clinical trials. As a result of their experimentation added numerous native drugs to their own system further enriching its treasures.

Unani medicine is a part of the culture of the Indian subcontinent, and is practiced widely in India, Pakistan, Bangladesh and other countries. Based upon the concept of the humors and vital forces, which control the functioning of the body, the principles of Unani medicine are not very different to those of Ayurveda. Besides the curative aspect, Unani medicine is used for the promotion of health and rejuvenation of vigour.

Delhi, the capital of Sultans, became an even greater center of culture and glory than Baghdad. The Khilji and Tughluq Sultans nurtured eminent Unani physicians, surgeons and ophthalmologists. During the reign of Sikander Lodi (1489-1517), Mian Bhowa an eminent courtier, composed a medical treatise entitled Madan-ul-Shifa Sikander Shahi in Persian. The Mughal rulers patronized physicians and surgeons from medical centers in Persia, more particularly from Gilan, Shiraz and Tabrez.

During the reign of Akbar, there was a mass exodus of learened men from regions, where Arabian medicine was taught. People came to India in search of name and fame, the political conditions in their countries not being favourable for their advancement. Abdul-Fazl, the renowned historian, makes mention of 29 eminent physicians who paid homage to Akbar. These included Hakim Ali Gilani, Hakim Abul Fatah Gilani (who invented the Indian hookah), Ain-ul-Mulk Hakim Shamsuddin Ali Sherazi, Hakim Hummam, Hakim- ul-Mulk Gilani and some Hindu physicians like Mahadev, Bhim Datt, and Narayan. This trend continued during the reigns of the successive great Mughals-Jahangir, Shah Jahan and Aurangzeb.

After the reign of Aurangzeb, while the Mughal emperors continued to support and encourage the teaching and practice of Unani medicine, the
gradual deterioration of their own political and economic situation acted as a setback to this system, as it did to other social facilities and activities. The English rulers showed no interest in either Unani medicine or Ayurveda, causing these systems to be further neglected. During the British rule, Unani medicine suffered a setback and its development was hampered due to withdrawal of governmental patronage. Since the system enjoyed faith among the masses it continued to be practiced. It was mainly the Sharifi family in Delhi, the Azizi family in Lucknow and the Nizam of Hyderabad due to whose efforts Unani medicine survived during the British period. An outstanding physician and scholar of Unani medicine, Hakim Ajmal Khan (1868-1927) championed the cause of the system in India.

Unani system of medicine, based on the ancient Greek and Indian theories of four humours (Phlegm, blood, yellow bile, black bile), holds an imbalance is believed to be caused by a faulty digestion.

Diagnosis entails ‘touching’ of the skin and examination of general characteristics of the patient to identify his inherent type of temperament and compare it with his current diseased state. Treatment aims at restoring the balance in the body’s self-preservation power by correcting the diet and lifestyle and prescribing appropriate drugs (Jaggi 1998).

**Siddha System of medicine:**

Siddha medicine is based largely in Ayurvedic concepts. It is likely that the intermingling of ideas and culture between the Aryans in North India and the Dravidians in South India resulted in a synthesis of Philosophy and pharmacological and therapeutic procedures. Siddha medicine written entirely in Tamil is still practiced largely in Tamilnadu.

Thiruvalluvar Nayanar, literally the secret devotee or the priest of the Pariah cast, is said to have been a weaver who lived in Maylapore (San Thome), a suburb of Madras. He is said to have lived around the first century.
The book *Thirukkural*, one of the most famous in Tamil literature, is said to have been composed by him at the request of his neighbours in order to bestow upon the Tamil people a *Veda* of their own cast. In Siddha system the methods of diagnosis are specified, with pulse reading and urine examination being considered important. Siddha advocates the use of metals and minerals in medicines.

Prevention of disease and promotion of health are important aspects of Siddha. Correct food habits are stressed and generally considered as a satisfactory method for curing common ailments, (Jaggi 1998).

**Tibetan System of medicine:**

The Tibetan system of medicine called Amchi is essentially based on Ayurvedic principles. It is practiced in Ladakh, Lahaul, Spiti, Darjeeling, Sikkim, Tawang and West Kameng. Tibetan medicine lays more stress on healthy living. It is inseparable from Buddhism. It is an amalgamation of art, science and spiritualism.

Ayurveda entered Tibet along with Buddhism. Around A.D. 650, the ruler of Tibet invited many Indian scholars including Ayurvedic physicians to this country. Tibetan scholars also come to India to learn Ayurveda. Ayurvedic texts were translated from Sanskrit into Tibetan language between the 12th and 14th centuries. *The Tanjur*, a voluminous Tibetan religious scripture, is a translation of twenty- two Ayurvedic methods. Tibetan secular literature also contains many medical works, the most popular one is known as *Rgyud Bzi*.

The traditional Tibetan system of medicine is unique in that it holds one’s karmas or actions, past and present, primarily responsible for upsetting the body’s balance and causing disease. Climate, evil spirits and germs are others causative factors. It also requires the practitioner and the patient to be deeply religious as prayers and religious rituals are believed to enhance the
efficacy of treatment and medicines. Diagnosis comprises examination of the pulse and urine followed by asking the questions to patients. Herbs, minerals and animal products are used in Tibetan medicine and special diets are prescribed (Jaggi 1998).

**Herbal Medicine in North-East India:**

There is no comprehensive work on herbal medicine on any of the area of northeastern India in general. During the last three decades several publications have appeared on medicinal plants of northeastern India. Some promising work carried out in this field are by the Baruah & Sarmah, (1984 – 1987) on medicinal plants used by the Northeast tribes; Begum & Nath, (2000) on medicinal plants used for skin diseases; Mudgal & Jain, (1980) on local uses of *Coptis teeta* distribution and cultivation; Sarma & Baishya, (1992) on medicinal plants used for different ailments by the North East tribes; Kumar (2002) mentioned 230 medicinal plants of North east India, and their uses; Rai & Sharma, (1994) on status, usages and potential medicinal plants of the Sikkim Himalayas.

Rao (1990) on medicinal plants used by Ao and Angami Naga, and on medicinal herbs. In Tripura workers in this field are Deb (1968) on medicinal plants of Tripura; Singh et al (1997) on Ethno-medico Botanical studies. In Sikkim major works were carried out by Rai & Sharma (1994) on medicinal plants of Sikkim Himalayas and Singh (1973) on medicinal fern of Sikkim Himalaya.

**Herbal Medicine in Arunachal Pradesh:**

There is no comprehensive work on medicinal plants and the ethnobotany of any of the ethnic groups or on any of the area of northeastern India in general. This is also true for Arunachal Pradesh. Kanjilal et al (1934-1940), however, mentioned some uses of plants by the people including the Abor inhabiting Arunachal Pradesh (old Assam region); Jha (1984) mentioned in a very brief way the uses of herbal medicines by the tribes of Arunachal Pradesh in his book *Wealth of Arunachal Pradesh*. During the last two decades several publications have appeared on ethnobotany of northeastern India including Arunachal Pradesh. A special bulletin brings out on *Medicinal plants of Arunachal Pradesh* by Haridasan et al (1995) from SFRI. The work is a compilation of literature studies and field surveys. In this bulletin 72 medicinal plants has been described briefly and a list of 464 medicinal plants, which are available in Arunachal Pradesh, were mentioned. Works carried out on tribal medicine of Arunachal Pradesh are by Bhuyan et al (2003) described 49 medicinal plants used by the Tagin tribe; Das (1996) on plants uses by the Adis; Pandey et al (1990) on 28 healing herbs of the Mons. District level works carried out on medicinal plants of Arunachal Pradesh are by Sarmah et al (2003), who recorded the ethnomedicinal uses of 116 plant species from Tawang and Kameng district; Bhuyan (1989) on medicinal flora of Lohit district; Dam & Hajra (1996) ethnobotany of the Monpas of Kameng district; Hajra (1977) on important medicinal plants from Kameng district; Nath &

**Aims and Objectives of the present work:**

There is no comprehensive work on medicinal plants from West Kameng and Tawang districts and only sporadic works have been carried out on these two districts and almost no work have been carried out on East Kameng district of Arunachal Pradesh.

Therefore, the present work on "Medicinal flora of erstwhile Kameng district of Arunachal Pradesh - their value addition and ethnomedicine" have been undertaken with the following objectives:

(i) Inventorization and assessment of medicinal plants of the district.
(ii) To work out the availability of medicinal plants used in different indigenous systems of medicine in India (Ayurveda, Unani and Siddha).
(iii) To work out the medicinal plants of the district having values in international and domestic market.
(iv) To explore and to record the indigenous knowledge of the people about the curative properties of plants.