CHAPTER I:

INTRODUCTION
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Nature's enormous treasure is the first choice of human beings since the dawn of civilisation as a resort to their starvation and feeling of humiliation. Their survival has been dependent on their innate curiosity of their environment. Being brought up in the natural environment they devoted themselves to isolate the curious behaviour of the herbs and plants within this treasury with all their power, wisdom and knowledge. Indeed, intelligensia of the ancient world were able to detect the curious behaviour of the plants by trial and error and thereby astonished the world by revealing which ones are remedial, which ones are harmful and which gives the highest nourishment.

The endless quest for a happy and prosperous life led them to isolate and detect the medicinal properties of the herbs and plants which can remove sufferings of human life. The wide spread and long standing practice of using herbs and plants in medicine in Eurasia, especially around the Mediterranean, this sub-continent and China has been transcribed through the pictographs of Egyptians, the clay tablet ideographs of Babylonians and the Vedic sanskrit as well as by verbal communication of the secretive, fraternalistic Greek and other pharmacist (Stern,1974).
There was essentially a period of 1000 years during which little progress was achieved in the medicinal sciences and in botany after the contributions to medicines of Hippocrates (460-377 BC), Dioscorides (1st century AD) and Galen (131-200 AD) together with early Arabian Physicians. Actually original data in botany were accumulated during the middle ages and new recipes were added in successive periods (Lange, 1970). Further the history of different nations and different religions have also revealed the use of mysterious properties of herbs and plants. Presently diverse works have been done on plant chemistry and their biochemistry and pharmacology etc. in its all possible scientific parameters. Still nature is mankind's greatest chemist and many compounds remain yet to be discovered in plants.

Development and use of plants in Ancient India:

The use and study of medicinal plants in India is an ancient art of the days of antiquity. Indians have perpetuated the empirical science of herbology in relation to health not in harmony but in mutual confliction because of various systems of life style. Yet India has been one of the biggest and renowned centre in the world where the healing science of human ailments was elaborately and specifically studied. Here ancient practice of Hindus are
known as Ayurvedic. The literatures of the healing science have permeated to Asia, Asia minor, Europe, China and other Western countries.

Indian philosophy is one in which all the branches of science are harmonised. The Vedas are the highest authority of the Hindus among the oldest scripts of India. Since the time of Rigveda medicinal plants have been used in the prevention and cure of disease and for promotion of health and happiness. Rigveda (4500-1600 BC) is the only oldest Indian script perpetuated an empirical science of herbology in relation to health hazards. The healing science of medicinal plants have been elaborately and scientifically described in Rigveda encompassing traditional, spiritual and mythical role. Atharvanaveda (1000 BC), the essence of all the other three Vedas, is another hymns where the use of plants as drugs have been explained systematically and also mention about the use of minerals as medicine after proper purification.

Ayurveda (Science of life), an Upaveda of Atharvanaveda, is treated as one of the oldest treatise of medical science in India (also in world) and contains hymns of remedy and prolongation of life. This oldest monograph of life science is the mile-stone of Indian medical science where the properties and uses of the plants (as drug) are
detailed in addition to the various influences upon the physical, psychological and meta-physical aspects of human life. Because of manifold qualities of mankind, Ayurveda attracted scholars of various countries vis. Greek, Arabic, Egyptian, Chinese at about 2500 BC and 600 BC. The two major Samhita's - Charak Samhita and Susuruta Samhita also indicates the unique place of Ayurveda in this regard.

In Charak Samhita, specially, the characteristics and remedial effects of plants has been mentioned in addition to the medical ethics, pharmacy and study programme for students and teachers. On the other hand, Susruta Samhita extensively deals with surgery in its 120 chapters and included all branches of medical science (vis, pathology, embryology, anatomy, toxicology, medical treatment and diagnosis of some other special disease). Ayurveda or the Indian system of medicine has been made fairly more scientific by Charak and Susruta and their Samhitas are our authorities today. Because of high medicinal and medical value their ancient treaties were translated into Greek, Arabic, English, Latin and German languages in as early as eighth century.

The inhalation of medicaments (different kinds of plants or extracts etc) before surgical operation were described
in another treatise - Bhojaprabhandha. This treatise was written at about 980 AD and said to have been used since the time of the Buddha. The precise knowledge of medicinal use of plants of Buddhist was compiled in Vinayapijakat.

Other important treatise compiled in the light of ancient Indian medicine were - Rasavidya - deals with chemistry of different elements, compounds, pharmaceuticals, plants etc; Sarangadhara Samhita (14th century AD) - gives instructions on posology, terminology and pharmaceuticals and examination of pulses etc; Bhava-Prakash (15th century AD) - specified the origin of Ayurvedic cosmology, principles of Health, materia-medica etc. These high valued and authentic literature of medicinal and medical science of India have attracted the Western and Asian scholars and the mobilisation of manpower and literature had taken place for the relief of human distress and disabilities. Jacolliot, an English scholar remarked - "we should not forget that India, that immense and luminous centre of olden times, was in constant communication with all the peoples of Asia and that all philosopher's and sages of antiquity went there to study science of life". In the light of the invaluable informations of the Vedas, Mahakavyas and other valuable manuscripts, treatise - not only the physical properties of the natural vegetations are recognised but also probed into the principles
regarding their medicinal properties which are found irrefutable in this advance age of science.

**Traditional and Indigenous system of Medicine:**

The traditional and indigenous system of medicine is not only in vogue in India since the time of antiquity but also perpetuate throughout the world till date. Specially there is a great disparity between the health care services in the urban and rural areas due to the concentration of trained personnel in urban areas. Although the modern system of health care is readily available in parts of the world yet about 80% people in rural areas are still living even without elementary health care (WHO 1978). Great reliance has to be placed upon self-medication and traditional medicine. Because of this fact in 1978 WHO has estimated that traditional medicines covers atleast 80% of the population. Even WHO recognise the value of traditional medicine systems and attempts are being made to develop these to their fullest potential and use to their maximum advantage throughout the world (WHO 1978). Similar recommendations have been made by first South-East Asian & Pacific Congress of Clinical Biochemist meet in January, 1978.
The practitioners in the traditional Medicine can generally be grouped into 3 types namely - i) the herbalists who enjoy the prestige and reputation of being the real practitioners of traditional medicine, ii) the divine healers whose practice depends mostly on the purported supernatural powers of diagnosis and who on occasion use the medicinal plants and iii) the witch doctors who also use plants as a part of treatment.

In 1974 UNICEF and WHO have conducted a joint study about the health needs in the developing countries and concluded that the traditional practitioners of traditional medicine of different categories should be trained for the Primary health care services including traditional birth attendants.

In 1976 WHO's Regional Committee for Africa has arranged a technical discussion programme on "Traditional medicine and its role in the development of health services in Africa". In pursuing the practice of traditional medicine in Africa, in the past decade WHO organised a number of conferences on this subject and the main ones having being held in Dakar in 1968, Cairo in 1975 and Abidjan in 1979. The working group of WHO, established in June 1976, has taken a realistic programme for the promotion, development and co-ordination activities of traditional medicine throughout the world. In similar manner the Mexican
Institute of Medicinal Plants has conducted research programmes on Medicinal Plants - i) to create a bank of information from 16th century to modern times, ii) to isolate their active principle on the cardiovascular system with anti-diabetic and anti-parasitic properties. In the same year (i.e. in 1976) similar programme had been adopted by the Regional Committee of the South-East Asia for the promotion of traditional and indigenous system of medicine. Further for popularisation and exploration of traditional medicine and to collect more facts and figures the 1st International Conference on Traditional Asian Medicine (ICTAM) was held in 1979 in Canberra (Australia). In this conference scientist and research workers from all parts of the world had participated and the importance of traditional medicine of different countries have discussed and brought to the light.

The latest International Horticultural Congress was held in Germany, one of the biggest research centre of the world on traditional medicine, in 1982 at Humberg where the Protection and Cultivation of Medicinal and Spice Plants used in traditional system of medicine have been discussed.

Carl F. Taylor (1976) has estimated that the organised health services in India provide only 10% of the medical care, that another 10% is provided by qualified physicians
in the towns and cities and that the balance is split between home medical care and indigenous and traditional practitioners. It is clear that out of 8000 published recipes of Ayurvedic Materia Medica some 1200 drugs are in frequent use and so simply prepared that they could be easily adopted anywhere in the world. Thus despite the expansion of medical health care, there is no indication that traditional systems are losing their influence.

In China traditional medicinal technique uniquely involving herbology and acupuncture have been fused with cosmopolitan medicine to form the New Chinese Medicine (Kao, 1973). In this regard Dr. Zhang Junteien remarked in the National Academy of Sciences that - "In our country increasing emphasis has been laid in recent years on researches on natural products for medicinal use". Dr. Zhang (1979) claimed that there are 5000 species of medicinal plants in China including 1000 that are in common use. Keji (1982) reveal that the use of traditional medicine in cardiovascular disease decreases the severity and mortality of patients and thus creates a new emphasis in this line. Under the auspicious of WHO and UNDP, a group of community health specialist and senior health administrator of 29 developing countries conversed on Peking in 1977 to study the New Chinese Medicine System. The New Chinese Medicine thus develop in its own line of
action with newer and more scientific experimental technique and concept and that treats man as a whole entity. Thus the development of traditional and indigenous system of medicine of different countries have been geared up to attain its fullest potential.

**Effect of Modern Science**:

Since the development of modern science almost to its fullest potential - chemical, biochemical, pharmacological and clinical investigation of medicinal plants on the basis of modern scientific technique has been possible with the advance of organic chemistry. The structural analysis and the identification of plant products become possible and large volume of work was published during the last quarter of the 19th and 1st half of 20th century. The ingenious effort of the genious scholars and experts led to the development of phytochemistry with newer and advanced techniques in a more extensive way. As a result more and more new compounds have been isolated from the medicinal plants viz. lipids, sugars, alkaloids, terpenes, glycosides, resins, lactones, steroids, hormones etc. The discovery of ephedrine from a Chinese indigenous drug 'Ma-Huang' actually opened the phytochemical research work and attracted research workers in this line all over the world. Rao (1977) have reported that as many as 50,000 new alkaloids have been discovered in plants.
In the industrialized country, phytotherapy has been developed in the last two decades tremendously accompanied with more and more consumption of the medicinal plants. It has been reported by the International Trade Centre that the total value of imports of raw materials of plant origin for the pharmaceutical and cosmetic industry rose from US $ 52.0 million in 1967 to US $ 71.2 million in 1971 and the annual growth since that day has been in order of 5-7%. The plant drugs used in the pharmaceutical preparation throughout the world since 1971 are as follows:

3000 tonnes of aloes, 10,000 tonnes of fresh artichoke leaves, 5000 tonnes of chinchona bark, 1000 tonnes of belladona, henbane and datura leaves, 1000 tonnes of foxglove leaves, 5000 tonnes of senna. The consumption of herb teas has also been rising steadily and quantity of different herbs consumed in 1974 were as follows:

150 tonnes of lime blossom, 250 tonnes of mint, 100 tonnes of camomile, 200 tonnes of verbena, 30 tonnes of orange blossom, 30 tonnes of star anise, 45 tonnes of eucalyptus leaves. These indicate the genuine interest shown in phytotherapy and medicinal plants throughout the world.

*Rauwalia serpentina* has been used in India and Malaya as a febrifuge, stimulant to uterine contraction, as an antidote to insect and snake bites, as a sedative and
hypotensive drug. Siddique and Siddique (1930) and later other research workers have investigated the chemical nature of the plant and more than 50 different alkaloids have been isolated. Vakil (1949) and Abrams (1969) studied the use in hypertension on the basis of ancient literatures. Chemical, biochemical and pharmacological analysis of plant *Ammi visnaga* (Apiaceae), widely used in the Mediterranean and Arabian countries as an anti-spasmodic in renal colic, reported to contain a glycoside - Khellin. It is also found to an effective drug in coronary vasodilator. Chinese reported the presence of berberine sulphate in coptis genes has a prominent tuberculostatic activity.

Now-a-days, the most feared human malady - cancer - creates havoc throughout the world causing many premature deaths. Research workers of East and West have been busy in isolating a drug from any source to cure and control this havoc. Indigenous medicines and folklore claims are the major source of their research work. Weisberger (1957) et al. reported the remedial effect of *Allium sativum* (Garlic) on the basis of modern analysis which was used as an anticanceral drug in India, Bulgaria, France and British columbia. Hartwell (1960) also reported some medicinal plants effective in cancer. Red Indians of North America, remote inhabitants of USA,
in Russia, in Great Britain have used the red sap from *Sanguinaria canadensis* (blood root) for treatment of cancer. On the basis of these report Stockl (1929), Shear et al. (1960), Phelan et al. (1962) isolated alkaloids Sanguinarine and Chelerythrine from this plant and their biochemical and pharmacological studies have been done. Savel (1966) reported two alkaloids - Vinblastine and Vincristine present in *Vinca rosea* which has been used as an anticancerous herb in India. Thus more and more researches have been conducted on medicinal plants in every nook and corner of the world to isolate and formulate a drug for the thrilling dread of cancer.

Likewise the isolation of cardiac glycosides from *Digitalis purpurea* (foxglove) used mostly in England, USA, and many western countries in the treatment and prevention of cardiac failure is another record of discoveries because more than one million people died of cardiac failure in USA in 1972 alone. Thus Botanist and Chemist have revealed that Apocynaceae, Bignoniaceae, Brassicaceae, Cactaceae, Liliaceae, Scrophularia are the major genes of cardiac glycosides (McCawley, 1955) and isolated and identified hundreds of effective glycosides. Koji (1982) reported that medicinal plants of these genes are used in the cardiovascular disease in China and engaged themselves in the isolation of a drug on modern
Salix genes used as indigenous medicines by the villagers of North America, USA, Europe and Eurasia as a pain killer and antifever drug led scientist to discover the 19th century's one of the important anti-pyretic and pain killer drug the - Aspirine.

Rutin, another important glycoside isolated from Ruta graveolens has been reported from 40 different species of plants. It has been widely used in the capillary fragility and more recently its remedial effect in the after effect of atomic radiation (Knowltan 1949). Demethoxy Kanngin from Pongamia glabra (1950), an anticanceral plant; flavonoid glycosides from Rutaceae (1956) and other genes; hygrine from coca; conine from hemlok; piperine from piper; atropine, hyoscine from Solanaceous; quinine, cinchonine from chinchona; opium alkaloids from opium; vitamins - like ascorbic acid, carotene, riboflavin etc., amino acids, terpenes etc. are the recent discoveries of the western and eastern scientist and research workers which have unveiled the active principles of the indigenous drugs used widely in different parts of the world since time immemorial. Their pharmacological, biochemical and clinical trials have been made on the basis of the indigenous importance which enhance the
modern medicine to a great leap.

Likewise many more literatures can be cited on the progress of phytochemistry and its application for alleviation of human suffering on the basis of indigenous and traditional system of medicine throughout the world.

During the recent years organic chemistry has made rapid and remarkable progress particularly in the field of synthetic chemistry. Chemists have synthesized very potent and effective drugs after having the knowledge of the structure and nature of the compounds isolated from the plants and thereby the use of indigenous herbs and plants directly has been reduced to a great extent. Further the synthesis of arsenical and antimalarial drugs for the treatment of protozoal disease and sulphonamides for the treatment of bacterial diseases are great achievements of synthetic organic chemistry. Due to the human disturbance and ruthless exploitation of plant resources the synthetic organic chemistry has filled up a major portion to overcome such difficulties.

National Progress:

India is unquestionably the country occupying topmost position in use of herbal drugs having as many 540 plant species in different drugs and medicines (Kapoor and Mitra, 1979). 75% of the total population in India consult
the traditional physicians and the sales turnover of indigenous medicines is about one and half times of modern drugs (Rustogi, 1980).

In India systematic investigation of medicinal plants actually started with the setting up of Calcutta School of Tropical Medicine in 1921, under the leadership of Col. Chopra, a premier in the medical field. The aim of this pioneering work of Col. Chopra was to isolate the active principles of medicinal plants on modern scientific basis and study of their biological effects.

In addition to his survey of medicinal and poisonous plants available in different parts of India about another 118 medicinal plants used as indigenous drugs were subjected to chemical and biological investigations. Col. Chopra enlisted his works and published in the form of a book "Glossary of Indian Medicinal Plants" - a unique treasure for all scientific workers in this line. Further he has recorded the distribution and abundance of medicinal plants and their folklore and traditional use. Later Sir John Simerson and his group ( ) started systematic examination of the essential oil bearing plants of the country. The 8th International Symposium on the chemistry of natural products (1972) have laid importance in the study of natural products and thus a number of research centres in the universities and research centres
have taken programme in this line. In 1950 (Central Drug Research Institute, Lucknow) have been established for promotion of scientific analysis on medicinal plants. In 1964 Ministry of Health and Family Planning Deptt., Govt. of India had taken up two schemes of survey of medicinal plants (at Haridwar) and Indian Survey of Medicinal Plants (at Ranikhet), a survey unit - in order to explore the remote places of India to isolate and identify the indigenous medicine. More such units have been later set up almost in each state of the country. In 1969 the Central Council for Research in Indian Medicine and Homoeopathy had been set up by the Govt. of India to promote and foster research in different aspects of fundamental and applied Ayurveda, Siddha, Unani, Homoeopathy systems of Medicine and Yoga system.

**Cultivation of Medicinal Plants : Scope and Utility :**

In recent years there have been increasing in screening an ample supply of medicinal plants because of drastic decrease or extinction of plant resources. Excessive biotic pressure of the forest is also responsible for degradation of the natural resources. The biotic pressure may be due to over exploitation of natural resources for timber, overgrazing, excessive lopping for fodder, mismanagements specially in the forties and fifties,
monocultivation or planting of huge land under a single species, burning of forests by the local people and use of forest or wood land for purpose other than forestry. Considering all the factors it is seen that the cultivation and preservation of medicinal plants is one of the important task of the society and Govt.

It is needless to say that India possesses climatic condition varying from the torrid to the frigid region and has been described as an epitom of climates, seasons and soil of the world. Because of these factors it embraces vast quality of different species of herbs and plants. About 2000 species of plants with possible medicinal properties are known to grow in India and about 5 lacs Ayurvedic practitioners has been utilising these plants (WHO). The Indian pharmacopia and Ayurvedic pharmacopia show that these are over 167 plant species having forest origin which are used both in Ayurvedic and in western system of medicine. But during 1965-66 India imported about 80% of drug ingredients costing of 145 million rupees and the export reached 139 million rupees during 1974-75. Further the annual requirements of digitalis lanata for its crude drug is 1.48,000 kg and at present India imports about 9-10 tonnes of digoxin (Anonymous, 1979). Some varieties of local herbs have substituted some imported ingredients after proper
standardisation and thereby helps in the promotion of export. In order to make up the deficiency, Indian Council of Agricultural Research and Central Council of Scientific and Industrial Research have undertaken some programmes in the cultivation of medicinal plants. Later, Indian Council of Medical Research has also taken steps for the promotion and cultivation of medicinal plants on priority basis. It can also be cited that a world wide programme has been taken for the cultivation of medicinal plants under the auspicious of the Therapeutic Requirements Committee of Medical Research Council, Great Britain, in 1941 and State Department of Agriculture, USA. Such organisation exists in most of the European countries, viz, Germany, Belgium, Holland, France, USSR etc. and are doing splendid work in the cultivation of medicinal plants which in turn earn a good amount of foreign exchange.

Earlier it was mentioned that Assam is one of the largest producer of medicinal plants of India because of its varieties of climatic conditions and topography and hence its inhabitance maintains a Ayurvedic way of life since time immemorial. But due to some minor reasons it has to procure medicinal plants from other states of India. It is therefore thought that the cultivation of large number of medicinal plants in Assam is quite necessary from its
medicinal and economical points of view. In recent years State Forest Department has been trying to expand and intensity the cultivation of medicinal plants. At present these are only a few medicinal plant gardens in Assam e.g. Ayurvedic College Garden, Gauhati, Regional Research Laboratory Garden, Jorhat, State Forest Department at Amsoi and Basistha and four to five other private gardens have cultivated some important medicinal plants like Rauwolfia serpentina, Rauwolfia canescens, Piper migran, Solanum khasianum, Dioscorea deltoidea, Mentha piperta and Euclaptus, Citronella etc. Most of these are available for sample cultivation only. From the economic point of view it can be cited that in the year 1974-75 the State Silviculturist Deprt. has earned a profit of Rupees 1,30,750.00 from the cultivation of a single medicinal plant namely Rauwolfia canescens. Tiwari et al. (1974) and Shah and Yadav (1967) have indicated that the cultivation of medicinal plants in Uttar Pradesh a farmer can earn as much as 10 times more against the cultivation of traditional crops like wheat, barley, rice, bazra etc. It is also mentioned that the topograph and climatic conditions of Assam are quite suitable for the cultivation of medicinal plants in large scale. Bhattacharjee et al. (1977) have reported that there are prospects of cultivation of about 125 medicinal plant species in Assam.
Further the annual requirement of medicinal plants only for the Govt. Dispensaries in a meagre amount in Assam is not small. According to a report of Assam Ayurvedic College, Gauhati the annual requirement of medicinal plants in the year 1979-80 would be about 50 tonnes for manufacturing a limited number of Ayurvedic drugs. The expansion of production to its fullest potential require a huge amount of medicinal plants which is not possible only from natural sources. The cultivation of medicinal plants in every nook and corner of Assam may help in overcoming the situation to a great extent. Thus it can be concluded that the cultivation of medicinal plants not only protect and preserve the medicinal plants but also increase the revenue of the state and solve a minor portion of unemployment.

Assam in the field of Medicinal Plants: Past and Present

Assam, situated in the North East of India, is known for its mysterious past. Because of high rainfall and manifold climatic condition Assam is endowed with wide variety of valuable flora. The only monograph "Flora of Assam" by Kanjilal et al (1939) contains some authentic information on the floral resource of Assam and this region. In this monograph over 4310 different species of 142 different plant families have been included. The most common and major families occurring in Assam are Apocynaceae,
Asteraceae, Euphorbiaceae, Moraceae, Acanthaceae, Compositeae, Leguminosae, Anonaceae and Myrsinaceae. The Russian Scientist, Vivilov (1976) has recorded to be the 1st and foremost centre of origin of many of the cultivated plants which are widely used in medicine.

The flora and fauna of the state is the richest in the world and naturally a lot of medicinal plants of tropical and sub-tropical nature are available here. The culture and therapeutic use of plants as drug is very ancient in Assam. Various traditions, customs and socio-economic behaviour of different ethnic groups of the state contribute in developing and popularizing the system. The Assamese medicinal works known as "Nidana" and other Ayurvedic works, particularly, 'Bhavaprakash' of 11th century were well in vogue among the people of that time.

In addition, there were hundreds of Assamese literature which deals with disease and their treatment by both Ayurvedic and 'Sejali' system (the act of Assamese physician). Hunter (1879) prepared and enlisted a long list of medicinal plants in his work "Statistical Account of Assam". Barua (1884) pointed out that though the sanskrit works on Ayurveda were not entirely rendered into Assamese yet parts of them were rendered Assamese. Barua (1933) recorded that there were certain specific way of remedies in the Kamrupi Ayurvedic Pharmacopia, which were associated with the name of Nagarjuna, a tantric siddha and
alchemist of yore. Now-a-days, the traditional practice is confined particularly in the interior villages and the medicinal plants are thus partially exploited. It is a matter of great regret that the work and study on plant products remained sporadic and no remarkable efforts are being made to systematically examine the medicinal plants of this state and region.

Since the last few years back a few groups of scientific workers have engaged themselves in a systematic survey of medicinal plants occurring in Sibsagar, Kamrup, Nowgong, Karbi Anglong, Meghalaya, Arunachal etc. investigation on the basis of folklore claims and traditional use of medicine. Gopinath (1974), Majumdar et al. (1977), Bhattacharjee et al. (1977, 1979), Baishya et al. (1980), Deka et al. (1983) have brought to light some medicinal plants available in Assam and in this region. Further it has also been revealed from their work that there is enough scope for study of the important and interesting aspects of the medicinal plants utilizing the modern scientific techniques. Needless to say that these folklore and traditional medicines tend to extinct and are confined in the remote villages in the hands of tribal and village people. Majumdar et al. (1978), Goswami et al. (1982) has thrown some lights in this line in order to draw the attention of the research workers which may help to discover some new drugs.
It is evident from the foregoing speculation that chemical, biochemical, pharmacological and clinical study of the active principles of the medicinal plants available in Assam have been waiting for the scientific workers. But it is matter of great regret that the phytochemical study in this state has not as developed as in the other parts of the country, although the establishment of the Calcutta School of Tropical Medicine in 1921 the phytochemical study have been rapidly developed longitudinally and latterally in India in different parameters like alkaloid, glycoside, terpenoid, lipid, pigment etc.

Recently with the establishment of Regional Research Laboratory, Jorhat, phytochemical study is slowly progressing in Assam. Kupchan (1968, 1970) made an extensive study on the alkaloids of *Stephania larpandifolia* collected from Assam and isolated two new biogenetically interesting hasubanan type of alkaloids. Gopinath (1974) studied the medicinal plants available in Sibsagar, Nowgong and Karbi Anglong of Assam. From *Litsea sabifera* collected from Sibsagar district and isolated two new alkaloids - sebiferine, a morphine dienone alkaloid and a new aporphine alkaloid - litsiferine. Mahanta (1974) reported the presence of acetylind linkage in some medicinal plants with a preliminary investigation of some medicinal plants available in Assam. He also reported a detailed analysis and active principles of *Piper sylvaticum*
Piper boehmeriaefolium Wall., Machilus bombycina King, Alphonsea venticosa Hook. The presence of vaticanin and some other new terpenoids in the Vatica lanceaefolia Linn and in the Dipterocarpaceae family are revealed by Kotaky (1977). Borthakur (1978) investigated certain medicinal plants viz, Cryptocarya amygdalina, Litsea laeta and Litsea salicifolia of Assam, and reported the presence of polyolefinic acid, nor-aporphine alkaloid and other alkaloids. Saikia (1979) and Barua (1980) isolated phenolic, terpenoid compounds from Chisochetan peniculatas Hiern, Canasium resiniferrum Brace, Sagesbeckia orientalis, Inule eupatorioides, Chromolena odorata and Compositeae family respectively. Another anti-canceral and anti-malarial herb Tithonia diversifolia (Hemsl) Ray was investigated by Barua (1980) and reported the presence of sesquiterpene lactones. Earlier Rastogi et al. (1976) reported the presence of tagitinin as one of the active constituent in this herb. Thus the study of the folklore and traditional medicine and their investigation on modern scientific stand point can pay rich dividend to the research workers which may cure some incurable diseases. In this way the study of medicinal plants have been progressing in this state and region.
In spite of the extensive study of the cardioactive glycosides only the gross manifestations of the altered organs and tissue function are understood to-date, use of biochemical approach is necessary to understand the detail mechanisms of actions in the cellular, the sub-cellular and the molecular levels.

*Thevetia neriifolia* Juss or Yellow Oleander plant is very widely distributed in Assam. Many folklore claims are associated with the poisonous properties and the therapeutic use of the different parts of this plant. The glycosides of *Thevetia neriifolia* Juss have shown to be a very promising cardiac glycosides having a number of good qualities. The plant and its glycosides have not as yet been very thoroughly studied chemically, pharmacologically and biochemically.

It is therefore aimed in the present investigation to study the chemical nature and biochemical effects of the extract of the plant. In Chapter III, the chemical properties including determination of the molecular weight and empirical formula of the glycoside extract, the spectral nature have been described and in the subsequent chapters the effects of the administration of the extract in varying doses on respiration rate, blood glucose, blood protein,
alkaline phosphatase, cholesterol and calcium have been studied. In Chapter-VIII, the histochemical changes in the brain, liver and pituitary after administration of the extract have been presented to explain the paralytic effect of the extract. An attempt has been made to explain and correlate the findings in Chapter IX.

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