CHAPTER - 2
REVIEW OF LITERATURE

2.1 AN OVERVIEW

Since the beginning of human civilization, medicinal plants have been used by mankind for its therapeutic value. Nature has been a source of medicinal agents for thousands of years and an impressive number of modern drugs have been isolated from natural sources. Many of these isolations were based on the uses of the agents in traditional medicine. The plant-based, traditional medicine systems continue to play an essential role in health care, with about 80% of the world’s inhabitants relying mainly on traditional medicines for their primary health care (Owolabi et al., 2007).

Medicinal plants are plants containing inherent active ingredients used to cure disease or relieve pain (Okigbo et al., 2008). The use of traditional medicines and medicinal plants in most developing countries as therapeutic agents for the maintenance of good health has been widely observed (Anon., 1996). Modern pharmacopoeia still contains at least 25% drugs derived from plants and many others, which are synthetic analogues, built on prototype compounds isolated from plants. Interest in medicinal plants as a re-emerging health aid has been fuelled by the rising costs of prescription drugs in the maintenance of personal health and well-being and the bio-prospecting of new plant-derived drugs (Lucy and Edgar, 1999).

Long before the earliest record available today, it seems many different people cultures discovered that some plants are not only good to eat, but many plants have healing properties. As civilization grew from 3000 BC onwards, that is, in Egypt, India, China and the Middle East, the use of herbs became more sophisticated and gradually the first written account of plants of medicinal value were made. Nearly half or more of all medicines currently prescribed are derived from members of the plant kingdom. Ancient Egypt was not
alone in recording the healing power of plants and gave the world the famous *Eberus papyrus* of Circa 1500 BC.

The instant rising demand of plant-based drugs is unfortunately creating heavy pressure on some selected high-value medicinal plant populations in the wild due to over-harvesting. Several of these medicinal plant species have slow growth rates, low population densities, and narrow geographic ranges (Nautiyal *et al.*, 2002), therefore, they are more prone to extinction (Jablonski, 2004). Conversely, because information on the use of plant species for therapeutic purpose has been passed from one generation to the next through oral tradition, this knowledge of therapeutic plants has started to decline and become obsolete through the lack of recognition by younger generations as a result of a shift in attitude and ongoing socio-economic changes (Kala, 2000). Furthermore, the indigenous knowledge on the use of lesser-known medicinal plants is also rapidly declining. Continuous erosion in the traditional knowledge of many valuable plants for medicine in the past and the current renewal interest, the need to review the valuable knowledge with the expectation of developing the medicinal plants sector arises. (Kala *et al.*, 2006).

The ethnobotanists have been trying to preserve the use of medicinal plants by various ethnic groups so that the information could be passed on to the modern world and be applied by the modern man in treating different diseases in a more modernized way in the form of medicines and others.

The diverse ethnic communities with their traditional cultures are often exploited, making them gradually lose their knowledge and information about their own traditional cultures in the modern world. Because of this, they are unable to use many of their forest resources. And so before these people completely lose their knowledge of plants having medicinal properties, there is an urgent need to record as much information about them and to
study their properties and implications (Lalnundanga, 2000). The studies on folk medicines through ethnobotanical survey are gaining importance. In discussing the role of ethno botany in our search for new drug, we must constantly bear in mind the widespread exaggeration of the usefulness of ethnobotanical data. Nevertheless, we cannot afford to pre-judge reports of aboriginal uses of plants simply because they seem to fall beyond our limits of credence. Since primitive society possesses nothing more than a very limited intuition about the properties of plants. It therefore, behoves us to push forward, along with ethnobotanical investigation, studies on the flora in general (Schultes, 1962; Lalramnghinglova and Jha, 1999).

Systematic study about the knowledge gained by various ethnic group from their ancestors in regard to plants, used as foods, medicine, clothing, or religious rituals, are covered under ethno botany. The work so far undertaken in the field of medicinal plants under ethnobotanical researches by different workers to acquaint the modern world as well as local communities in an attempt to preserve and document vanishing knowledge and to introduce the use of medicinal plants abroad and in India are reviewed here.

2.2 ABROAD

There have been several ethnobotanists who have undertaken ethnobotanical investigations abroad. Some of the significant contributions in the field of Ethnobotany are mentioned below.

The foremost centre of ethnobotany is the Botanical Museum of Harvard University in Massachusetts and the evolution of the modern approach to the science of ethnobotany started in the United States. The best studied area for these purposes is the South-West of the United States of America (Ford, 1985).
The well known ethno botanists of the world, Dr. Richard Evan Schultes conducted ethno botanical exploration in Oklahoma, Oaxala, Amazon, Mexico and in other regions. He had spent almost 12 years among the tribals and worked on hallucinogens, medicinal and toxic plants (Schultes, 1938, 1954, 1956, 1962).


Abbas et. al. (1992) reported ethnobotanical information on 52 medicinal plants used in traditional medicine of Bahrain. Ethnobotanic information on 52 plants species of Sengkurong and 29 plants species of Bukit Udal of Darrussalam were given by Haji Mohiddin et. al. (1991) and Holdsworth (1991) respectively. 100 anti-leucodermic traditional herbal medicines consisting of 80 medicinal plant species being employed by Caucasians in the Mediterranean area were reported by Capitanio et. al. (1989).

Barrett (1994) has investigated 152 plants used by the people of Nicaraguasis, Atlantic Coast for the treatment of various diseases. The diversity and prevalence of medicinal plant used for this region has been reported for the first time.

Youngken et. al. (1970) documented plants for antimalarial activity. Ethnobotanical studies from Central Nigeria includes 52 plant species having ethnobotanical importance (Bhat et. al., 1990).

Huyin et. al. (1998) have reported that Baphicacanthus cusia plays a very important role in the traditional life of the Hani and other ethnic groups in Jinpin country, Yunnan province. Indigo obtained from aerial parts is used to dye their traditional clothes, and the roots and leaves are used as medicine.
George (1995) has reported pharmacopoeia of 108 medicinal species from 52 families. Fifty percent of the pharmacopoeia is composed of species indigenous to Tonga, 30 percent of the species introduced by Polynesian settlers, and 20 percent are species of post-European introduction. The traditional and modern uses of 48 native plants which grow in the First Yukon region, Alaska, have been documented and the medicinal and edible material used by the Guich in Athabaskan and Caucasian residents have been identified. The present and past values of these plants in Guich’s culture are discussed (Holloway and Alexander, 1990).

Halbarstein and Saunders (1978) have reported traditional medicinal practices and medicinal plant usage on a Bahamian Island. Weniger et al. (1986) have documented popular medicinal plants of the Central Plateau of Haiti. The ethnomedicinal plants from Garifuna of Eastern Nicaragua is reported by Coce and Anderson (1996). The folk herbal medicine used by Fiji Indians is documented by Singh (1986).

Caceres et al. (1990) have screened 84 plants which is used to cure gastrointestinal disorders caused by Enterobacteria in Guatemala. Giron et al. (1991) have reported medicinal flora used by the Caribs of Guatemala. The 16-ethnomedicinal plants used by the people of Guatemala against Gram-Positive Bacteria, (causing agent of respiratory diseases) were evaluated by Caceres et al. (1993).

Joshi and Edington (1990) reported medicinal plants of central Nepal. Ethnobotanical observation on 71 plant species from Tharu tribe of Chitwan District, and 86 plant species from Makawanpur District of Nepal were reported by Dangol and Gurung (1991) and Bhattarai (1990), respectively.

Bhattarai (1990) has reported medico botanical information on 51 empirically accepted prescriptions involving 36 plant species belonging to 36 genera and 27 families, collected from the rural inhabitants of Kabhrepanchok District of Central Nepal.
Quisenberry (1960) lists more than eight hundred known medicinal plants in the Philippines alone, including flora efficacious in the treatment of a number of maladies such as asthma, diarrhoea, dysentery, malaria, diabetes etc.


Chung *et al.* (2008) documented the occurrence of five species of *Acamella* in Taiwan, of which two were not reported for the flora of this island before, namely: *A. brachyglossa* and *A. ciliata*.

Kunwar *et al.* (2010) reported 48 Nepalese medicinal plants used in the Far-west Nepal and validated the ethnomedicinal uses by comparative assessment with the common uses of the Ayurveda.

Analgesic and Anti-inflammatory Effect of *Clausena suffruticosa* root extract in animal model has been studied by Chakma *et al.* (2011), and revealed the presence of alkaloids, flavonoids, tannin and sterols. Evaluation of antioxidant, antibacterial, antifungal and cytotoxic effects of *Clausena suffruticosa* ethanolic root extract was done by Rahman *et al.* (2011).

Okere and Adegeye (2011) studied the In vitro propagation of an endangered medicinal timber species *Khaya grandifoliola* C. Dc. to prevent the species from extinction.

studied the traditional utilization of Chinese Chellera (*Stellera chamaejasme* L.) in North West Yunan, China.

2.3 INDIA

India has several traditional medical systems, such as *Ayurveda* and *Unani*, which has survived through more than 3000 years, mainly using plant-based drugs. The *materia medica* of these systems contains a rich heritage of indigenous herbal practices that have helped to sustain the health of most rural people of India. The ancient texts like *Rig Veda* (4500-1600 BC) and *Atharva Veda* mention the use of several plants as medicine. The books on ayurvedic medicine such as *Charaka Samhita* and *Susruta Samhita* refer to the use of more than 700 herbs (Jain, 1968).

The study on ethno botany in India was initiated by the economic botany section of Botanical Survey of India since 1954. Dr. E.K. Janki Amal (1956) had published a paper on subsistence economy of India. In 1960, Dr. S. K. Jain started intensive field studies among the tribal of central India and published several paper on ethno botany (Jain 1963 a-c; 1964 a-b; and 1965).

In India, written records of the use of plants for curing human or animal diseases can be traced back to the earliest (4500-1600 BC) scriptures of the Hindus, the *Rigveda* (Jain, 1994).

The Indian system of herbal medicine had caught the attention of the West since the beginning of the colonial days and some books on these have been published. The important contributions are: (a) Garcia da Orta (1563), the personal physician of the then Portuguese Governor in India published his *‘Colloquies on the Simples & Drugs of India’*; (b) 12 volumes work on Kerela medicinal Plants (1678-1703) from Amsterdam, (c) *A catalogue of*
Indian Medicinal Plants & Drugs (Fleming, 1810) and (d) Materia Medica of Hindoostan (Ainslie, 1813).


Ethnobotanical investigation has led to the documentation of a large number of wild plants used by the tribal for meeting their multifarious requirements (Anonymous, 1990).

Mudgal and Pal (1987) gave a synoptic treatment on ethnobotanical works in India. Binu et. al. (1992) compiled an outline of ethnobotanical research carried out in different states and union territories of India. The last two decades have seen different works carried on to record information on different medicinal plants from different regions of the country (Jain and Mitra, 1997). Prakash (1998) reviewed status of Indian medicinal plants.

Some of the important plants and other products used in indigenous medicine in Andhra Pradesh and in India are provided by Gambel (1967) and Watt (1981). Rao et. al. (1996) reported 27 plant species used to cure dental disorder at Tirumala Hills in Chittor district of Andhra Pradesh. Reddy et. al. (1989) investigated plant based crude drugs of Anantpur and Chitoor districts, Andhra Pradesh. They reported 64 plant drugs. Kumar and Nisteswar (1990) documented 188 medicinal plant species of Kakinada district. Hemadri et. al. (1987) recorded 211 species of the medicinal plants wealth of the state of Andhra Pradesh. The medicinal plants wealth of Karimnagar districts of Andhra Pradesh was documented by Hemadri (1990, 1991). The medicinal plants used for family planning and birth control is reported by Vedavathy et. al. (1991).

Santhals’ taboos, medicines and folklore customs were documented by Boddings (1925, 1927). The medicinal plants used by Santhals, Mundas, Orans, Birhors, Bedia of Chotanagpur plateau are reported by Tarafder (1983 a-b, 1984 a-b). Tarafder (1983 c-e) documented ethnogynaecolgy of different tribals in Bihar. The ethnomedicinal plants of
famous Saranda forest is documented by Jain (1989). Jha et al. (1989) reviewed folk medicine of Mithila zone of Bihar.

The plant species having ethnomedicinal value, used by Bhils, Rabaries, Gharashias and Dubias tribes in Gujarat were documented by Shah and Gopal (1985). The ethnomedicinal informations along with other uses of 133 plant species used by tribals of Saurashtra are recorded by Shah et al. (1981). Joshi (1988) provided information on 139 plants of medicinal value. The ethnomedicinal uses of plants in Sunderban recorded by Tribedi et al. (1993).

Lal and Yadav (1983) recorded 69 species having medicinal importance and 66 prescriptions for therapeutic dose were also mentioned. Medicinal application of each species was presented. Jain (1984) documented 26 medicinal plant species of Morni and Kabasar hills in Ambala district of Haryana.

50 plant species having ethnomedicinal importance along with part of plants used and mode of administration of each species are reported by Kapahi (1990). The medicinal plants of Chamba Forest Division and Kangra Forest Division (Uhal valley) is recorded by Gupta (1964) and Uniyal and Chauhan (1971) respectively.

Ethnobotanical uses of plant species by the Gaddhis, Gujjars and Bakerwals inhibiting Bhadarwah hill in Jammu were reported by Kapur and Nanda (1992). A survey on the ethno botany of Kashmir Sind Valley was done in 1983 by Dar et al. The medicinal plants used by Amchis of Ladakh has been recorded by Srivastva et al. (1981).

The important contributions on medicinal plants from the state of Karnataka are medicobotany of Mysore (Rao, 1977) cited by Binu et al. (1992); medicobotany of Tumkur district (Yoganarasimhan et al., 1982); folk medicine of Bangalore district (Pushpalata et al., 1990); ethno botany of Soligas in Biligiri Betta (Hosagaudar and Henry, 1996) and the ethno botany of Gowlis of Uttara Kannada district (Bhandary et al., 1996).
The ethnomedicinal investigations containing information about the medicinal plants are reported by Mooss (1952, 1976, 1978); Kolammal (1979); Manilal (1981); Ramachandran and Nair (1981), Nambiar et. al. (1986) and Sivarajan and Balachandran (1994) and Radhakrishnan et. al. (1996).

Folk medicine of Baiga tribes along with medicinal uses of 25 species are reported by Pandey et. al. (1991). The flowering plants (233 numbers) of high medicinal value of Madhya Pradesh are recorded by Oommachan and Masih (1991). The medicinal plants commonly used by ‘Sahariya’ tribe are recorded by Jain (1992).

Vartak (1981) reported Medicinal plants of Karnala tribal area of Kolaba district in Maharashtra. Ethnomedico-botany of some sacred plants of Western Maharashtra and ethnomedico-botany of genus Mucuna from Western Maharashtra are recorded by Upadhye et. al. (1997).

Saxena and Dutta (1975) have investigated 82 medicinal plants used for antifertility, fibre and food by the rural folk of Orissa. Saxena and Tripathi (1990) recorded 200 plant species having medicinal uses. A survey of medicinal plants used by tribals of Mayurbhanj was carried out by Mudgal and Pal (1980); Tribedi et. al. (1982); Saxena et. al. (1981).

Ethnomedicinal plants suitable to cure venereal and gynaecological diseases are documented by Singh and Pandey (1996). Ethnomedicobotany of household remedies of Phagi Tehsil of Jaipur district is documented by Sen and Balra (1997). Khandelwal (1998) have reported ethnomedicine of Bhills in Rajasthan: plants used in diarrhea.

Raghunathan (1976) have documented medicinal flora of Nilgiri. Ethnomedicinal plants used by Malayali and Veduvar tribes of Salem district of Tamil Nadu were documented by Dwarkan and Ansari (1992).

Plant species used by Kols, Gondas, Lodhas and Gujars of Banda district, Uttar Pradesh against various infections were documented by Saxena and Vyas (1981). Other
notable works done in U.P are traditional uses of medicinal plants from Jaluan district (Khanna et. al., 1996); medicinal plants used by the forest ethnic of Gorakhpur district (Singh and Siddiqui, 1997); native medicine of Jansari tribe (Singh, 1997); ethno-medico-botanical studies on the fungi of Kumaun Himalaya (Joshi et. al., 1997) and native plant remedies for liver disorder among the tribals of Uttar Pradesh (Singh and Prakash, 1998).

The contributions in the field of ethnomedicobotany in West Bengal are plants of ethnobotanical importance used by Santhals, Bhumij, Birhors and Kherias in Purulia (Jain and De, 1996; Sur et. al., 1992); herbal medicines used by the tribals of Bhankura district (Namhata and Ghost, 1993); 36 plants used for rheumatic pain, chronic acidity and tuberculosis (Mishra et. al., 1997) and ethnomedicine to modern medicine: An observation studies in some villages in West Bengal (Ghosh and Sarma, 1997).

Ethnobotanically, the flora of Andaman and Nicobar constitutes an interesting group as it consists of considerable percentage of Malaysian elements (Binu et. al., 1992). Some of the interesting contributions in the field of ethnomedicobotany are ethnobotany of Shompens of Great Nicobar (Chakrabarty and Rao, 1988); ethnomedicobotany of Nicobarese (Dagar, 1989b; Dagar and Chakhtai, 1989) and folk medicines of Nicobarese (Dagar and Dagar, 1996).

Chawla et. al. (2012) studied the traditional, pharmacological and phytochemical properties of various bioactive compounds present in Ficus carica Linn.

Kala (2010) documented 37 plant species available in the agro-forestry system and used for curing various ailments by traditional healers in Tehri Garhwal, Uttarakhand.

Acute anti-inflammatory activity of Pandanus fascicularis Lam. was studied by Kumar et. al. (2011).
Raina et. al. (2010) studied reproductive biology of Picrorhiza kurroa – a critically endangered high value temperate medicinal plant and reported the chromosome number and reproductive behaviour for the first time.

Joshi et. al. (2012) studied the ecology and conservation of threatened plants in Tapkeshwari Hill ranges in the Kachchh Island, Gujarat, India. They assessed 13 plant species, of which 5 species are reported to be medicinally important.

Rout and Panda (2010) documented 77 plant species represented by 73 genera and 41 families used by the local people in traditional health care system in Mayurbhanj district of Orissa.

Kumar et. al. (2012) reviewed the hepatoprotective activity of 10 medicinal plants which are commonly used in the Indian traditional system of medicine.

Desai and Patel (2012) recorded 24 medicinal plants from Gadhvada (Dharoi Range) area, District Mehsana (North Gujarat), India.

2.4 NORTH EASTERN STATES

Information and reports of the ethnobotanical investigations carried out in these regions by several ethnobotanists are as follows.

Some of the notable contributions in the state of Assam are- Medical plants used by the Karbi Anglong of Mikir Hills (Borthakur, 1976); ethnomedicinal surveys of Miris (Hajra and Baishya, 1981); Medical plants from Tezpur district (Puri, 1987); Ethno botanical information on Plants associated with religio-cultural beliefs of the Tai Khamti race of the Assam and Arunachal Pradesh is reported by Gogoi and Borthakur (1991). Plant used to cure jaundice in Golaghat district is documented by Pandey et. al. (1996). The herbal remedy of the Nepalese of Assam is also reported by Borthakur et. al. (1996).

Joseph and Kharkongor (1981) surveyed the Khasi and Jaintia tribes and recorded 100 plants species of ethno botanical importance. Rao and Neogi (1980) studied Ethnobotany of Khasi and Garo tribes. Medicinal plants used by Garo tribes are also studied by Rao and Shampru, 1997; Rao, 1989). While ethno botanical uses of 33 plants employed by the Khasis, Jaintias and Garos for Ichthyotoxic purpose are documented by Chhetri et. al. (1992).

Folk medicines used to cure 25 diseases by the Manipuris are recorded by Sinha (1990); Devi (1989, 1990) contributed ethno biological studies of Manipur valley. Singh (1996) reported aphrodisiacal plants used by the Meitei community. Medico-botany of Meitei community in Manipur state is recorded by Singh and Huidrom (1997). Some other important contributions are: medicinal uses of 36 species used by Naga tribes in Ukhrul district (Elangbam et. al., 1989). Ethnobotanical uses of 931 medicinal plants (Sinha, 1987).

Medicinal plants used by Zealang sub-tribes of Nagaland are recorded by Jamir and Rao (1990). Ethno botanical folk practices and beliefs of the Ao Nagas have been reported by Sapu and Yogendra (1996). In 1997, Jamir reported the medical herbs utilized by the Naga
tribes. Megoneitso and Rao (1983) have documented medicinal plant species used by the Angamis of Kohima district.

Some of the most relevant contributions in the state of Arunachal Pradesh are Medicinal plants of Arunachal Pradesh compiled by Hajra (1977); Ethnomedicinal Plants of Tirap district (Tiwari et al., 1978); Ethnobotanical studies of plants used by Monpa tribes of Kameng District (Dam and Hajra, 1981); Medicinal Plants of Lohit District (Bhuyan, 1989); Ethnobotany of wild edible plants (Haridasan et al., 1990); Tiwari and Tiwari (1996) contributed some important medicinal plants of the tropical, sub-tropical and temperate regions of Siang, Subansiri and Tirap Districts. Ethnobiological records on 171 plant species of lower Subansiri district was done by Gangwar and Ramakrishnan (1990). Notes on the ethno botany of the Monpa tribe of Tawang district were recorded by Rawat et al. (1997).

The contributions made by Hajra and Chakraborty (1982), Bennet (1983) and Uniyal (1980) in the field of ethnomedicinal plants in Sikkim are important.

Deb (1968) has recorded medicinal plants of Tripura. Ethno-medico-botanical studies in Tripura reported by Singh et al. (1997).

Srivastava and Adi community (2009) studied Traditional knowledge of Adi tribe of Arunachal Pradesh on plants and reported 113 plant species used by the Adi tribe.

The ethnomedicinal information along with other uses of 214 species of plants used by the Nyishi (Daffla) tribe of Arunachal Pradesh is documented by Srivastava and Nyishi community (2010).

Mao et al. (2009) reported 7 potential ethnomedicinal plants uses, 7 over collected medicinal plants and 25 threatened important medicinal plants of North East India.

Benniamin (2011) documented 51 medicinally important Pteridophyte species of North East India with special reference to Arunachal Pradesh.
Lepcha et al. (2011) conducted a survey on medicinally important plants from the landslide prone areas of East Sikkim, India, and documented 25 species of plants.

Khumbongmayum et al. (2005) documented 120 ethnomedicinal plants in the sacred groves of Manipur. Kayang (2007) studied the Tribal knowledge on wild edible plants of Meghalaya, Northeast India and recorded 110 wild growing plants along with their ethnomedicinal uses and other uses.

Singh (2011) reported 28 commonly used anti-diabetic plants in the indigenous system of health care which are found in Manipur, North-East India.

Pfoze et al. (2012) documented 120 medicinal plants used by the Nagas and Kukis tribes in Senapati district of Manipur. Rout et al. (2010) studied traditional medicinal knowledge of the Zeme (Naga) tribe of North Cachar Hills District, Assam on the treatment of diarrhea and documented 8 plant species used for the treatment of diarrhoea.

Some of the notable works done in the field of ethnomedicine in the state of Mizoram are enlisted below:

In 1940, Lorrain mentioned a few traditional medicinal plant used by the Lushai (Mizo). Some diseases/ailments along with medicinal treatments from plants were mentioned by Irish (1975) and Thangchuanga (1979). A total of 228 cases of human diseases and 27 animal diseases along with herbal medicine used for their treatments were documented in ‘Zoram Upa Pawl Thurawn Bu’ by Anonymous (1984). Herbal medicine used for treatment of 97 diseases has been reported by Darlianthanga (1989). Saptawna (1990) reported 58 plants species used as medicines. Lallianthanga (1990) reported 128 plant species used as local medicine. Vailinga (1991) also documented 165 diseases and their ethnomedicine, Lalramnginglova (1991) documents 437 plant species on the basis of secondary informations. Mekkalath (2000) documented 200 plants species used as medicine.
In 1997, Lalramnghinglova and Jha reported the ethno medicine including medical of plants & animals combined, used by ethnic communities of Mizoram. A detailed account of 236 plants species of ethno botanical importance have been documented by Lalramnghinglova (2003). Lalnundanga (2000) also has documented 68 plants species of ethnomedicinal importance. Some of the most notable contribution are made by Lalramnghinglova (1996); Lalramnghinglova and Jha (1996); Lalnundanga et. al. (1997); Lalramnghinglova and Jha (1997); Jha and Lalnundanga (1998); Lalnundanga and Jha (2000) and Sawmliana (2003).

Bhardwaj and Gakhar (2005) recorded 17 ethno-medicinal plants used by the tribal of Mizoram to cure cuts and wounds. Lalfakzuala et. al. (2007) reported 89 plant species used ethnobotanically in the western Mizoram.

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