



CHAPTER-2

**REVIEW
OF
LITERATURE**

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2.1 Historical review of ethnobotany

The term ethnobotany was first given by Harshberger in 1895 to the studies dealing with plants used by the aborigines Harshberger, (1896). Ethnobotany has been defined as the study of the relationship between man and his ambient vegetation. According to Schultes (1962), ethnobotany is “the study of the relationship which exists between people of primitive societies and their plant environment”. In other words, it is an anthropological approach to botany.

Much before the coining of the term “ethnobotany” usage of plants by man for different purposes was mentioned in classical Indian, Greek and Arabic traditions dating back from ancient time to 9th century A.D. Rig-Veda and Atharva -Veda, which date back to 2000 B.C. to 1000 B.C., are the oldest Vedic literature resources of India. They contain valuable information at the latest regarding medicinal plants which were in vogue during that period.

Kirtikar and Basu (1935), have stated “The ancient Hindus should be given the credit for cultivating what is now called ethnobotany” Works of Kalidasa (fourth century A.D.), Varahmihira (sixth century) A.D.) Banabhatta (ninth century A.D.) provide a fair glimpse into the botanical knowledge and medicinal wisdom of the times (Raghunathan.K 1987).

The Yunani, system of medicine, which originated in Greece during 400 B.C., came to India through the Arab physician who held accompanied Mughal invaders. The Siddha system, which is known to have originated from the Hindu God Siva, passed through his wife Parvati and finally his disciplines, was in use mainly in Dravidian civilization (Jain, 1994).

The term “ethnobotany” was not coined until 1895 by the botanist John Willium Harshberger, the history of the field begins long before that. In A.D. 77, the Greek surgeon Dioscorides published “De Materia Medica” which was a catalogue of about 600 plants in the Mediterranean. It also included information on how the Greeks used the plants, especially for medicinal purpose. This illustrated herbal publication contained information on how and when plant was gathered, whether or not it was poisonous, its actual use, and whether or not it was edible (if even provided recipes). Dioscorides stressed the economic potential of plants.

A good number of “Materia Medica” were also compiled by various workers. This practice is still going on and more and more such publications in the form of Books, Journals, Monographs Travelogues, Ethnographies and commentaries are coming up.

With the advancement of civilization, the knowledge about the uses of plants for various purposes was also depicted in the form of painting, inscriptions, carving, symbols, folk song, folk tales, myths, rhymes, riddle and proverb etc. in these materials the man plant relationship of various civilization such as, Assyrians (400 B.C.) Sumarians (3500 B.C.) Ancient Indians (3500 B.C.) Chinese (3000 B.C.) and Egyptians (2500 B.C.) can be seen. In the oldest Chinese literature “Era-Ya (3000 B.C.) a good number of plants have been described with medicinal properties.

The people from Greece and Rome also contributed to the knowledge of ancient medicinal plants. Theophrastus in book “History of plants” described about 500 plants having medicinal and food values. Elder and Pling described thousands of medicinal plants in the book “Natural History” (Tippo and Fuller, 1954).

In 19th century a good number of workers compiled literature regarding the traditional uses of plants by the primitive human societies. In this connection John Flemings (1810) published a book entitled “Catalogue of Indian medicinal plants and Drugs”

Ainsle (1813), written “Materia Medica of Hindustan” and Harshberger (1852), entitled a book “Thirty Five Years in the East” were the important contribution (Sinha 1988).

In India, it was Dr. S.K Jain, (1986) from NBRI, Lucknow, affectionately known as Father of Indian Ethnobotany who made pioneering investigation. Growth and development of ethnobotany in India owes much to the painstaking works done by eminent scientists on different aspect of ethnobotany lik S.K. Jain, S.L .Kapoor, V.P. Kamboj, K.V. Billore, N.C. Shah, Ved Prakash, R.P.Rao , K.C. Audichya. D.S.Bhukani, P.V.N. Kurup, K.C. Tiwari, Anil Goel, Archana Godbole, Pushpagandan, H. Santapau, Virendra Nath, A.K. Pandey, Momon Ali, Usha Shome, K.K. Kirtikar, M.L. Dhar, B.N. Dhawan, K. Himadri, S.K. Borthakur, K.S. Manilal etc.

In the beginning, ethnobotanical specimens and studies were not very reliable and sometimes not helpful. This is because the botanist and the anthropologists did not come together on their work. The botanists focused on identifying species and how the plants were used instead of including how plants fit in to people’s live. On the other hand, anthropologists were interested in the culture role of plants and the specific aspect. Therefore, early ethnobotanical data does not really include both sides. In the early

twentieth century, botanists and anthropologists finally collaborated and the collection of reliable, data began.

The work so far done in the field of ethnobotanical researches by different workers to help the modern world as well as local communities in recuing disappearing knowledge and returning it to local communities in India and world reviewed here.

2.2 Worldwide ethnobotanical studies:-

The modern modern approach to the science of ethnobotany evolved in U.S.A. and the foremost centre for the botanical aspects is the Botanical Museum of Harvard University in Massachusetts. Here, ethnobotanists like Rachards Evans Schultes, Richard Gorden Wasson, Siri Von Reis, Altshul, Timothy Plowman, E. Wade Davis etc. contributed in various field of ethnobotany (Shah, 1987). The South West of U.S.A. is the best studied area in the World for ethnobotany (Ford, 1985).

The well known ethnobotanists of the world, Dr. Richard Evan Schultes conducted ethnobotanical explorations on Oklahoma, Oaxaca, Maxico, and Amazon and in other regions. He had to spend almost 12 years among the tribals and worked on hallucinogens, medicinal and toxic plants (Schultes, 1938, 1954, 1956, 1962 and 1963).

Barrau *et al.* (1973) at, National Museum of Natural History, Paris has done work on ethno-agriculture. This group has been engaged in the study of origin of cultivated plants and linguistics in South East Asia. Berlin and Breedlove (1973) contributed to the knowledge of ethnotaxonomy, ethnobotanical nomenclature in folk biology and plant classification of the traditional communities of Mayan-speaking people of highlands, Chipas. Berlin *et.al.*(1974), during several years of field work at Mayan- speaking group of the highlands of Chipas, a state of Southern Mexico, collected and documented many hundreds of folk botanical categories.

Ford (1978) publication on the nature and status of ethnobotany, which is a compilation of several papers on the anthropological and ethnobotanical information, is if great significance.

Muhunnah (1991) has investigated 44 plants, belonging the Hehe and Safawa tribes, inhabiting the Southern highlands of Tanzania. Abbas *et al.* (1992) investigated 52 folk medicinal plants used in tradition medicine of Bahrain.

Cunningham (1993) studied african medicinal plants with emphasis on conservation and primary health care. Bhat *et al.* (1990) have reported 52 plants species collected during ethnobotanical survey of Kwara state, Central Nigeria. This first hand information pertains to the modernized people of Central Nigeria. Ford (1978) edited a landmark

volume: The Nature and Status of Ethnobotany that contains several interesting papers on ethnobotany.

The history of the study of useful European plants dates back to ancient Greek times. One of the earliest works is *De Materia Medica*, published in A.D.77 by the Greek surgeon Pedanius Dioscorides about the use of six hundred plants in the Mediterranean. Later from Medieval and Renaissance periods to the nineteenth century, scholars and explores continued collecting and describing the indigenous uses of plants worldwide. For instance, the Swedish botanist Linnaeus, the founder of modern scientific botany, also published books of such as *flora Lapponica*, where he included not only plants of Lapland but also their local uses. (Linnaeus, 1737).

Later, modern botanical and medical science itself was built on studies of medieval European uses of the food plants and medicinal herbs that graced the tables of both nobles and peasants (Altron, 1990)

Manadhar (1980) documented some lesser known medicinal plants and food plants of Nepal. Manandhar (1989) presented ethnobotanical notes on some piscidal plants of Nepal. Gill, L.S. (1997) studied folk medicinal plants practices and beliefs of the Bihi people in Nigeria.

Yusuf *et al.* (1994) reported the medicinal plants of Bangladesh. Qureshi, S.J. *et al.* (2001) studied ethnobotanical study of Kahuta from Rawalpindi district Pakistan. Ogle B.M. *et al.* (2001) studied micronutrient composition and nutrition importance of gathered vegetables in Vietnam.

Khan *et al.* (2002) presented the ethnobotanical survey in Rema Kelanga wild life sanctuary in Bangladesh. Van Wyk, (2002) the documentation and study of people plant interaction in Africa began relatively with the arrival of European colonists. Ghani *et al.* (2003), studied on medicinal plants of Bangladesh with chemical constituents and uses. Chherti and Shrestha (2004) studied ethnobotany of some weeds of winter crops in Dhulikhel, Nepal.

Malia (2005) has reported uses of some Indian plants in folk medicines of Nepal. Fajinmi, A.K. (2005) reported herbal remedies in animal parasitic disease in Nigeria. Estmoba *et al.* (2006) studied medicinal wild plant knowledge and gathering patterns in a Mapuche community from North-Western Patagonia. Shinwari *et al.* (2006) studied medicinal and aromatic plants of Pakistan. Uddin, S.N. (2006), studied traditional uses of ethnomedicinal plants of the Chittagong hills tracts Bangladesh. Ibrar *et al.* (2007)

contributed ethnobotanical studies on plants resources of Ranyal hills, district Shangla, Pakistan.

Birendra *et al.* (2009) conducted a study on some ethnomedicinal plants in Kavrepalan chowk district, Nepal. Qureshi *et al.* (2010) studied ethnomedicinal uses of herbs from Northern part of Nara desert, Pakistan.

Uddin M.S. (2010) conducted ethnobotanical studies of the Khumi community in Bandarban, Bangladesh. Gidey Y. (2010) studied of traditional medicinal plants by indigenous people in Mekele town capital city of Tigracy regional state of Ethiopia. Cruze-Garcia *et al.* (2011) conducted ethnobotanical investigation of wild food plants used by rice farmers in Kalasin, North East Thailand. Uprety *et al.* (2012) studies traditional use medicinal plants in the Boreal forest of Canada.

Kumar *et al.* (2014) studied ethnobotanical survey of medicinal practioner and indigenous people in different districts of Chittagong division, Bangladesh. Uddin M.Z. *et al.* (2014) studied determination of informant's consensus factor of ethnomedicinal plants used in Kalenga forest, Bangladesh. Yassin Seada *et al.* (2015) conducted ethnobotanical study of indigenous knowledge of plants material culture in Masha and Yeki district, south west Ethiopia. Hong *et al.* (2015) studied ethnobotanical study on medicinal plants used by Maonan people in China.

Some of the important foreign books on various aspect of ethnobotany of the Coahuilla Indians (Barrow,1900); *Notes on Jamarican Ethnobotany* (Beckwith 1927); *Etyhnobotany of the Thompson Indians of British Columbia* (Steedman,1930); *Ethnobotany of Western Washington* (Gunther,1945); *An Introduction to Ethnobotany* (Faulks,1958)., *Ethnobotany of the Hawaiians* (Beatrice,1975); *The Nature and Status of Ethnobotany* (Ford,1978); *ethnobotanica Lengua Maskoy* (Arenas, 1981); *Huastec Mayan Ethnobotany* (Alcorn, 1984); *People of the Desert and sea: Ethnobotany of the Indians* (Felger and Moser,1985); *Edible plants of the Praire:An ethnobotanical guide* (Kindsher,1987); *Thompson Ethnobotany* (Turner, *et al.*, 1900); *Ethnobotanical classification* (Berlin,1992); *Ethics Ethnological Research and Biodiversity Ethnobotany: A methods Manual* (Martin, 1995); *Ethnobotany- Pricipal and Applications* (Cotton,1996); *Dariene Ethnobotanical Dictionary* (Duke,1968); *Amazonian Ethnobotanical Dictionary* (Duke & Vasquez,1994); *An ethnobotanical analysis of the tree species common to the subtropical moist forest of Peten, Guatemala* (Mutchnick & Mc Carthy,1997) and *Economic Botany and Ethnobotany in Al-Anadalu*

(*Iberian Peninsula: Tenth-fifteenth century*), *An Unknown Heritage of Mankind* (Hernandez- Bermeza and Garcia- Sanchez, 1998).

2.3 Ethnobotanical studies in India:-

Ethnobotanical investigation has led to the documentation of a large number of wild plants used by tribals for meeting their multifarious requirements (Anonymous, 1900). In India, organized study of ethnobotany is of recent origin (middle of the century).

In India organized study on ethnobotany is of recent origin. Studies on ethnobotany was initiated by Dr. E.K. Janaki Ammal as an official programme in the Economic Botany Section of Botanical Survey of India since its very inception in 1954 and published a paper on subsistence economy of India (Janaki Ammal, 1956). From 1960 Dr. S.K. Jain started intensive field studies among tribals of Central India (Jain, 1963 a-e., 1964 a-d, and 1965 a-b). The publication from his group in early sixties triggered ethnobotanical activities in many other centres particularly among botanists, anthropologists and ayurvedic medicinal practitioners. During the last two decades, work has been initiated at *inter alia*, National Botanical Research Institute Lucknow., National Bureau of Plant Genetic Resources, Delhi., Central Institute of Medicinal and Aromatic Plants, Lucknow., Council for Research in Ayurveda & Siddha and Central Council for Research in Unani, Medicine. Several Universities have introduced ethnobotany in their syllabi. An AICRP on ethnobiology came into operation from 1982, at NBRI, Lucknow, four centres of Botanical Survey of India (Shillong, Howrah, and Coimbatore & Port Blair) and some other institutions (Jain & Mitra 1997).

Some of notable works are; plants used for food by tribals in Purulia (Jain and De, 1964), plants used in different herbal remedies of Lodha tribe in Midnapur district (Pal & Jain 1989).

Jain S.K. (1964) studied wild plants foods of the tribals of Bastar (M.P.) Jain, S.K. *et al.* (1964,) studied some less known plants food among the tribals of Purulia district. Pal, D.C. (1972) reported magico religious beliefs about plants among the adivasi of Bihar. Gaur, R.D. (1977) studied wild edible fruits of Garhwal, Himalya.

Agarwal (1981) studied trees, flowers and fruits in Indian folk songs, folk tales folk proverbs. Bennet (1983), Hajra & Chakroborty (1982) and Uniyal (1980) reported plants used by tribals, wild plants sold in market and a new source of food has been respectively. Mudgal (1987) gave a synoptic treatment on ethnobotanical works in India. Das and Mishra (1988) studied some medicinal plants of Koraput district, Odissa. Chandra (1989) studied medicinal plants used by the tribes of Arunachal Pradesh.

Viswanatan, (1989) Ethnobotany of the Malayalis in the Yelagiri hills of North Arcot district.

Arunnek kumar *et al.* (1990) & Arunee kumar & Nisteswar (1991) recorded 188 medicinal plants species from Rayalaseema, used for family planning and birth control. Binu *et al.* (1992) compiled an outline of ethnobotanical research work carried out in India. Dwarkan and Ansari, (1992) ethnomedicinal uses of plants employed by the Gounder 'malayali' and 'Veduar' tribes of Salem district. Sikarwar and Kaushik (1992) studied traditional medicines among the rural folk of Morena district, Madhya Pradesh. Pal (1994) presented observation on ethnobotany of tribal of Subansiri, Arunachal Pradesh. The ethnobotany of Kadars, Malasars and Muthuvans of the Annamalais in Coimbatore district was studied by Hosagoudar & Henry, 1996, and the tribal ethnobotany of Nilgiri district was reported by Mandal & Basu, 1996. Borthakur *et al.* (1996) reported plants used by the Miris or Mishings of Assam and plants in the folklore and folk life of the Karbis (Mikirs). Sinha (1990) reported ethnobotanical uses of 27 plant species employed by the Manipuris in their folk medicine against 25 diseases. Gaud & Pullaiah (1996) reported forty plants used in ethno-veterinary the Chenchus, Sugalis and Yorukalas tribes.

Borthakur *et al.* (1996) reported the herbal remedies of the Nepalese of Assam. Tiwari and Tiwari (1996) studied some important medicinal plants of the tropical, sub-tropical and temperate regions of Siang, Subansiri and Tirap district.

Rao *et al.* (1996) reported 27 plants species occurring in Tirumala hills of Chittoor district used by local people for dental disorder. Vedavathy & Murudula (1996) examined the traditional medicines practiced by the Yanadis tribe.

Pandey *et al.* (1996) the native plant remedies for jaundice in Golaghat district. Singh (1996) reported aphrodisiacal plants used by Meitei community of Manipur. Upadhye *et al.* (1997) reported a few plants used in worship by tribal communities in western Maharashtra along with their medicinal utilities. Reddy *et al.* (1997) reported some important medicinal plants used by the Chenchus, Erakalus, Yanadis, Sugalis etc. for the treatment of ephemeral fevers and anthrax in cattle. Jamir (1997) reported the medicinal herbs utilized by the Naga tribes.

Kausik *et al.* (2002) investigated biological activities and medicinal properties of Neem (*Azadiractha indica*). Singh *et al.* (2004) ecological studied ethnomedicinal uses of Pteridophytes of Amarkantak, Madhya Pradesh. Sinha *et al.* (2004) documented *Tinospora cordifoli* (Guduchi), a reservoir plant for therapeutic application- A review.

Tirkey and Jain (2005) reported tradition of clan names and conservation among the Oraons of Chattisgarh. Mahanta *et al.* (2005) studied natural dye – yielding plants and indigenous knowledge on dye preparations in Arunachal Pradesh. Sharma and Brijlal (2005) presented the ethnobotanical notes on some medicinal and aromatic plants of Himachal Pradesh. Jadhv (2006) studied ethnomedicinal plants used by Bhil tribe of Bibdod, Madhya Pradesh. Yesodharan and Sujana (2007) studied wild edible plants traditionally used in the Parambikulam, Wild Life Sanctuary, Kerala, India. Buragohain and Konwar (2007) studied ethnomedicinal plants used in skin diseases by some Indo-Magoloid communities of Assam.

Swarnkar and Katewa (2008) carried out ethnobotanical observation on tuberous plants from tribal area of Rajasthan. Sharma *et al.* (2008) presented ethnobotanical observations on Bamboos among Adi tribes in Arunachal Pradesh. Kaur and Chaturvedi (2008) studied ethnobotanical approach on wild plants for manufacturing musical instrument by Gond and Korku tribes of Vidarbha. Sikarwar *et al.* (2008) reported some unique ethnomedicinal perceptions of tribal communities of Chitrakoot, Madhya Pradesh.

Bandopadhyay *et al.* (2008) studied plants of Koch Bihar district, West Bengal. Shirat (2008) reported ethnomedicinal uses of some common lower plants used by tribals of Melghat region (M.S.) India. Chakma *et al.* (2009) studied nutritional status of Baiga –A primitive tribe of Madhya Pradesh.

Pattanaik *et al.* (2010) studied in the weekly fair of Koraput, Odissa. Sahu *et al.* (2010) reported ethnomedicinal plants by natives of Baragarh district of Odissa. Wagh Vijay *et al.* (2010) studied role of non-timber forest product in the livelihood of tribal community of Jhabua district (M.P.). Khyde *et al.* (2010) presented ethnobotanical reports about few important diseases from Akole tehsil of Ahmednagar district (M.S.) India. Jain, A.K. *et al.* (2010) conducted folklore claims on some medicinal plants by Bheel tribe of Guna district, Madhya Pradesh. Jamir *et al.* (2010) documented traditional knowledge of Lotha-Naga tribe in Wokha district, Nagaland. Kumar and Rao (2010) reported folk herbal medicines used by the Meena community in Rajasthan.

Sharma and Kumar (2011) conducted ethnobotanical studies on medicinal plants of Rajasthan (India): A review. Khongsai *et al.* (2011) reported ethnomedicinal plants used by different tribes of Arunachal Pradesh. Jadhav *et al.* (2011) studied documentation and ethnobotanical survey of wild edible plants from Kolhapur district. Kutum *et al.* (2011) conducted ethnobotanical study of missing tribes living in Fringe villages of Kaziranga national park of Assam, India. Wagh Vijay *et al.* (2011) studied ethnomedicinal plants

used for curing dysentery and diarrhoea by tribals of Jhabua district (Madhya Pradesh). Jain *et al.* (2011) studied traditional phytotherapy of Balaghat district, Madhya Pradesh. Ray *et al.* (2011) studied ethnomedicinal plants used by tribals of East Nimar region, Madhya Pradesh. Pareek and Trivedi (2011) conducted ethnobotanical studies on medicinal plants of Kaladera region of Jaipur district.

Jain Ashok *et al.* (2011) reported some ethnomedicinal plants species of Jhabua district, Madhya Pradesh. Srivastava *et al.* (2011) studied ethnomedicinal importance of the plants of Amarkantak region, Madhya Pradesh, India. Pathak and Mishra (2011) studied some medicinal plants of Sheopur district, M.P. Gangwar and Gangwar (2011) reported taxonomic and economic classification of riparian floral diversity along river Ganga in Garhwal Himalayan region of India. Srivastava *et al.* (2011) documented *Achyranthes aspera*- An important medicinal plant. Sahu (2011) studied plants used by Gond and Baiga women in ethno-gyneocological disorders in Achanakmar wild life sanctuary, Bilaspur, Chattisgarh.

Yadav *et al.* (2012) studied ethnoveterinary practice in Rajasthan, India: A review. Sharma and Kumar (2012) studied traditional uses of herbal medicinal plants of Rajasthan: Guggal. Jain Alka *et al.* (2012) studied the ethnobotany and nutritional values of wild rice [*Zizania latifolia* (Griseb)]. Turcz. ex. Stapp. Harishankarlal *et al.* (2012) studied ethnomedicinal uses of weeds in rice field of Hazaribag district of Jharkhand India. Jain and Tiwari *et al.* (2012) reported nutritional value of some traditional edible plants used by tribal communities during emergency with reference to central India. Singh and Ray (2012) studied medicinal plants used by tribals of Dhar district, Madhya Pradesh, India. Sharma *et al.* (2012) studied dye yielding plants of the Garhwal Himalaya, India. Shanmugam *et al.* (2012) studied traditional uses of medicinal plants among the rural people in Sivagangi district of Tamilnadu. Bobade and Khyade (2012) detailed study on the properties of *Pongamia pinnata* (karanja) for the production of biofuel.

Agarwal *et al.* (2013) conducted ethnobotanical studies on *Ocimum* spp. in Rajasthan. Sharma and Kumar (2013) reported traditional medicinal plants of Rajasthan, India. Padal *et al.* (2013) studied traditional phytotherapy of Vizianagaram district, Andhra Pradesh. Padal and Chandrasekhar *et al.* (2013) carried out ethnomedicinal investigation of medicinal plants used by the tribes of Peddabayalu mandalam, Visakhapatnam district, Andhra Pradesh. Jane and Patil (2013) reported an effective medicinal herb *Otitis media*. Ahirwar, J.R. (2013) studied socio-religious importance of plants in Budelkhand region

of India. Sharma and Sood (2013) conducted ethnobotanical survey for wild plants of district Solon, Himachal Pradesh, India.

Upadhyay Deepak (2013) studied ethnobotanical important plants in parts of Shivalik hills of Kangra district, Himachal Pradesh. Ahirwar J.R. (2013) studied socio-religious importance of plants in Budelkhand region of India. Srivastava (2013) studied ethnomedicinal plants used for treatment of gynecological disorder by tribal of Dindori district of Madhya Pradesh. Jatav and Mehta (2013) studied medicinal plants used in dermatological problems with special reference to Sahariya tribe of Shivpuri district of Madhya Pradesh.

Soni *et al.* (2014) documented forest fungi in the aid of tribal health-A case study. Jain and Verma (2014) studied assessment of credibility of some folk medicinal claims on *Bombax ceiba* L. Brahma *et al.* (2014), studied socio culture and religious plants used by Bodo tribe of BTC Assam, India. Terangpi *et al.* (2014) studied ethnobotanical plants of the kaebi ethnic group in Assam state (India) for management of gynaecological disorder. Saha *et al.* (2014) studied ethnoveterinary practices among the tribal community of malda district of West Bengal. Bhattacharya *et al.* (2014) reported *Dalbegia sisso* – an important medicinal plant. Thakur *et al.* (2014) studied of some ethnomedicinal plants used by tribals of Alirajpur, Madhya Pradesh, India.

Kumar *et al.* (2015) studied ethnobotanical utilization of climbers from Patna and Nalanda district of Bihar, India. Siva, R. (2015) studied status of natural dyes and dye-yielding plants in India.

2.4 Studies on comparative ethnobotany:-

Byg, R.A. (1986) studied medicinal plants of Sierra-Madie: Comparative study of Tarahumara and Mexican market plants. Barford, A.S., and L.P. Kvist (1996) conducted comparative ethnobotanical studies of the American groups in coastal Ecuador. Moerman *et al.* (1999) studied a comparative analysis of five medicinal floras.

Ladio and Lozada (2003) studied comparison of wild edible plants diversity and foraging strategies in two aboriginal communities of North Western Patagonia. Terashima and Ichikawa (2003) presented a comparative ethnobotany of the MBUTI and EFE democratic republic of Congo. Leoporatti *et al.* (2003) conducted preliminary comparative analysis of traditional medicine of Bulgaria and Italy. Vanderbroek *et al.* (2004) studied a comparison of 'traditional healers' medicinal plant knowledge in the Bolivian Andes and Amazon. Ladio *et al.* (2007) conducted a study on comparison of traditional wild plant knowledge between aboriginal communities inhabiting arid and

forest environment in Potagonia, Argentina. Satayana *et al.* (2007) studied traditional knowledge of wild edible plants used in the North West of Iberian Peninsula (Spain and Portugal).

Leporatti and Ghedira (2009) presented comparative analysis of medicinal plants in traditional medicine in Italy and Tunisia. Hart and Paul (2000) reported cladistic approach to comparative ethnobotany: dye plants of the South Western United states.

Malik *et al.* (2010) presented a comparative analysis of medicinal plants used by folk medicinal healers in three districts of Bangladesh. Mohammed Rahmatullah *et al.* (2011) conducted a survey of medicinal plants used by Garo and Nen Garo traditional medicinal practitioners in two villages of Tangail district, Bangladesh. Bradaces *et al.* (2011) studied medicinal plants use in Vanuatu: A comparative ethnobotanical study of three Islands.

Maroyi A. (2011) conducted ethnobotanical study of medicinal plants used by people in Nhema communal area Zimbabwe. Sop *et al.* (2012) studied ethnobotanical knowledge and valuation of woody plants species: a comparative analysis of three ethnic groups from the sub- sahel of Burkina Faso. Ellena Rachele *et al.* (2012) studied comparative medical ethnobotany of the Senegalese community living in Turin (North Western Italy) and in Adeane (South Senegal).

Berhane Kidane *et al.* (2014) studied use and management of traditional medicinal plants by Maale and Ari ethnic communities in Southern Ethiopia. Alfred Maroyi and Cheikhoussef (2015) conducted a comparative study of Medicinal plants in rural areas of Namibia and Zimbabwe. Malik Sadia *et al.* (2015) conducted a comparative ethnobotanical study of Cholistan (An arid area) and Pothwar (a semi arid area) of Pakistan for traditional medicines.

2.5 Studies on qualitative phytochemical analysis of medicinal plants:-

Phytochemical analysis of several medicinal plants has been carried out by many scientists in our country. Mojab *et al.* (2003) conducted phytochemical screening of some species of Iranian plants. Edoa *et al.* (2005) reported phytochemicals constituents of some Nigerian medicinal plants. Sharanabasa, P.P.A *et al.* (2007) conducted phytochemical studies on *Bauhinia racemosa* Lam., *Bauhinia purpurea* Linn. and *Hardwickia binata* Roxb.

Parekh and Chanda (2008) conducted phytochemical screening of some plants from western region of India. Doss A. (2009) conducted preliminary phytochemical screening of some Indian medicinal plants. Arunkumar and Mutuselvam (2009) studied on analysis

of phytochemical constituents and antimicrobial activities of *Aloe vera* L. against clinical pathogens.

Aiyelaagbe *et al.* (2009) carried out phytochemical screening for active compounds in *Mangifera indica* leaves from Ibadan. Khyade and Vaikos (2009) reported phytochemical and antibacterial properties of leaves of *Alstonia scholaris* R.Br. Ayoola and Adeyeye (2010) worked on phytochemical and nutrient evaluation of *Carica papaya* (Paw Paw) leaves. Agrahari, A.K. *et al.* (2010) conducted phytochemical screening of *Curculigo orchoides* Gaertn. root and tubers. Tiwari *et al.* (2011) presented a review phytochemical screening and extraction. Joshi *et al.* (2011) investigated antimicrobial properties of different medicinal plants: *Ocimum sanctum* (Tulsi), *Eugenia cryophyllata* (Clove), *Achyranthes bidentata* (Datiwan) and *Azadiractha indica* (Neem).

Yadav and Agarwala (2011) carried out phytochemical analysis of some medicinal plants. Verma *et al.* (2011) conducted analysis of phytochemical constituents of the ethnolic and chloroform extracts of *Calotropis procera* using gas chromatography, mass spectroscopy (GC-MS) technique. Dhale, D.A. (2011) conducted a study on phytochemical screening and antimicrobial activity of *Bauhinia variegata* Linn. Savithramma N. *et al.* (2011) carried out screening of medicinal plants for secondary metabolites. Khan Farhal *et al.* (2011) conducted phytochemical screening of some Pakistanian medicinal plants. Haddouchi, F.T. *et al.* (2011) conducted phytochemical study of *Thymus Fantanesii* and *Laurus nobilis*. Vaghasiya, Y.R. *et al.* (2011) carried out phytochemical analysis of some medicinal plants from Western region of India.

Nwokolo *et al.* (2012) reported phytochemical characterization and comparative efficacies of crude extracts of *Carica papaya*. Raphael E. (2012) investigated phytochemical constituents of some leaves extract of *Aloe vera* and *Azadiractha indica* plant species.

Wadood *et al.* (2013) carried out phytochemical analysis of medicinal plants occurring in local area of Mardan. Kumar *et al.* (2013) investigated antimicrobial efficiency of leaf extracts of *Pithecellobium dulce*.

Dhawale (2013) carried out phytochemical analysis of eight medicinal plants from Amravati district (MS) India. Ugwu *et al.* (2013) conducted phytochemical and acute toxicity studies of *Moringa oleifera* ethanol leaf extract. Wani *et al.* (2013) conducted qualitative phytochemical screening of three indigenous medicinal plants of *Lantana camara*, *Mangifera indica*, *Azadiractha indica*.

Yadav, Phani *et al.* (2013) studied on phytochemical evaluation of *Nyctanthes arbor-tristis*, *Nerium oleander* and *Catharanthes roseus*. Khated, N. *et al.* (2013) studied anticancer activity of *Carica papaya* extracts invitro and phytochemical analysis. Hussain *et al.* (2013) conducted preliminary phytochemical screening and proximate analysis of the trunk bark of *Alstonia scholaris* (L.) R.Br. Rawat Suman *et al.* (2013) studied on phytochemical screening and antimicrobial activities of *Cordia dichotoma* Forst.f. Kharat *et al.* (2013) conducted qualitative phytochemical screening of *Gnidia glauca* (Fresen) Gilg. Plant extract.

Kavitha and Premalakshmi (2013) conducted phytochemical analysis of ethnolic extract of leaves of *Clitoria ternatea* L. Das Gupta *et al.* (2013) conducted preliminary phytochemical studies of *Kalanchoe* (*Gastonia-bonnierei*). Arora Anubha *et al.* (2013) carried out phytochemical analysis of methanolic extracts of some medicinal plants. Phukan and Phukan (2014) conducted phytochemical and pharmacognostic analysis of *Alstonia scholaris* (L.) R. Br.