



PLANTS OF NUTRACEUTICAL AND ETHNO-VETERINARY THERAPEUTIC POTENTIAL VALUE IN GORAKHPUR DISTRICT OF U.P. (INDIA)

Ram Autar

Department of Botany, M M M P G College Bhatpar Rani Deoria, Uttar Pradesh, India.

ABSTRACT

The present ethno-medicinal investigation was undertaken for the documentation of information on uses and conservation of ethno-medicinal plants being used in various veterinary ailments. Out of 134 families with 600 genera and 1,027 plant species found in Gorakhpur the plants of 57 families represented by 106 genera and 132 plant species were used in various veterinary ailments. The study showed that Papilionaceae is represented by nine genera and ten species; Asteraceae is represented by seven genera and nine species whereas Cucurbitaceae by six genera and seven species; Poaceae by four genera and seven species; Caesalpinaceae by four genera and six species; Apiaceae by four genera and species each; Solanaceae by three genera and six species; Acanthaceae and Lamiaceae by three genera and species each; Moraceae by two genera and five species; Brassicaceae and Amaranthaceae by two genera and four species each; Menispermaceae and Liliaceae by two genera and three species each; Meliaceae, Sapindaceae, Anacardiaceae, Rosaceae, Lytharaceae, Apocyanaceae, Asclepiadaceae, Piperaceae, Euphorbiaceae and Zingiberaceae by two genera and two species each; Mimosaceae, Combricaceae, Rubiaceae, Dioscoreaceae and Cyperaceae by one genera and two species each; whereas rest twenty eight families, viz., Annonaceae, Fumariaceae, Cappariadeace, Carryophyllaceae, Malvaceae, Linaceae, Oxalidaceae, Rutaceae, Mitaceae, Leaceae, Myrtaceae, Punicaceae, Cactaceae, Plumbaginaceae, Oleaceae, Buddlejaceae, Cuscutaceae, Bignoniaceae, Verbenaceae, Plantagenaceae, Nyctagenaceae, Chenopodiaceae, Polygonaceae, Louraceae, Loranthaceae, Cannaceae, Agavaceae and Araceae are found to be represented with single genera and species each.



KEYWORDS: ethno-medicinal investigation , Asclepiadaceae, Piperaceae, Euphorbiaceae.

INTRODUCTION

Plants have a significant contribution towards the wealth of a country. During recent years, exploration of our plant wealth and its economic utilization have rightly been given due importance. The value of medicinal plants to the mankind is very well proven since Vedic period. The allopathic method of treatment is advancing day-by-day but still about 64% of world population depends on the traditional method of medicinal system for improving their health problems (Farnsworth, 1994). Out of 64 % of the world population, the major traditional users belong to the areas of rural and tribal areas of the developing countries. People of these regions are using neighbouring plant species for treatment of minor and major diseases either by their choice, or economic reasons or lack of access to other expensive treatments (Prance, 1991; Qureshi et al., 2006). The use of these neighbouring plants for overcoming the health related issues has started from many ancient eras in different part of the world.

As these plants are being used from many past centuries, the knowledge of people has enhanced the response of plants to respective diseases (Sen et al., 2011). Harshberger (1895) and Jain (1995) were the first who performed study on application of neighbouring plants as per the pre-historic knowledge base for medicinal use and such study comes under ethnobotany or ethnomedicine. Over 2,500 medicinal

plants are introduced to the modern world and still much more are yet to be explored (Huxley, 1984). India and China are two largest countries in Asia which have the richest array of registered and relatively well-known medicinal plants. Nature has been a source of medicinal plants for thousands of years and an impressive number of modern drugs have been isolated from natural sources. Unique geography, climate and environmental conditions of India, make it richest source of medicinal plants (Kshirsagar and Singh, 2000). About 65% of total population depend on such traditional knowledge for healthcare (Timmermans, 2003) while of the rural population, this amounts to 85% (Jain, 1994) in India. Our country is known for its rich ancient cultural Practices and about 300 tribal communities consisting of 53 million populations are still dependent on such source for health care (Reddy et al., 2010). Roughly the amount of plants engaged in such activities by these people ranges from 7000-7500 (Matthews, 2005; Mao et al., 2009; Survase and Raut, 2011). Unani, Siddha and Amchi medicine systems also provide a valuable source of knowledge of medicinal plants by prescribing about 700, 600 and 600 species, respectively (Joy et al., 1998; Ahmad et al., 2006; Samy et al., 2008; Sen et al., 2011) for healthcare uses. Plant produces a diverse range of bioactive molecules making them a rich source

of different type of medicines. Ethno-botanical and ethno-medicinal studies are today recognized as the most viable method of identifying new medicinal plants or refocusing on those earlier reported plants for bioactive constituents. However, many plants having medicinal value have been documented in our ancient literature but still there is a lack of documentation of plants which are being used by the tribal people (De et al., 2010; Sen et al., 2011; Kumar, 2013; Bajpai et al., 2016). Lack of proper documentation and oral communication of such knowledge base from one to another generation are forcing towards a need for scientific exploration and documentation of medicinal knowledge before it faces the risk of extinction (Sajise, 1995; Murthy, 2012). The study area is blessed with several floras by nature and it is referred as natural paradise and is very rich in ethnic and floristic diversity. Due to vast area of natural forests, Gorakhpur is well known as City of Forests. The rich biodiversity of Gorakhpur district of Uttar Pradesh has provided an initial advantage to its inhabitants for observing and scrutinizing the rich flora for developing their own traditional knowledge in curing various ailments of men as well as animals. The primitive tribals acquired the knowledge of economic and medicinal properties of many plants by trial and error methods and they are the store house of such valuable knowledge. This accumulated knowledge is passed on from one generation to the other by oral tradition without any written document. The people of the region are rich in ethno-medicinal knowledge owing to their close affinity with the surrounding vegetation. Many plant species of immense medicinal value are abundantly found in the district. Medicinal plants form the basis of traditional or indigenous systems of healthcare are being used by most remotely located dwellers of the area. Religious inspiration, inaccessibility and lack of medical facilities in

the villages seem to be the cause of depending on these medicinal plant species. Remedies based on these plants often have negligible side effect and due to relatively high costs of allopathic medicines, traditional herbal medicine have become an affordable choice for the poor people in rural areas. Traditional system of medicine is a wise practice of indigenous knowledge system, which has saved the lives of poor people in the region. There is great traditional knowledge hidden among the tribes and rural people of the district which can be used for human welfare. Keeping the aforesaid view, the rich ethno-medicinal practices of the area have already received considerable scientific attention and the ethno-medicinal practices have been documented. The present work was undertaken to document and analyse various traditional herbal method of treatment for various ailments in the rural areas of Gorakhpur district not only for human beings but also for the domestic animals.

STUDY AREA

Gorakhpur is known as "Tarai belt of Uttar Pradesh" is a natural heaven for wild vegetation and rich phytodiversity. Gorakhpur is situated on the basin of rivers Rapti and Rohini. The geographical shape of the Gorakhpur City is of bowl. Gorakhpur (26.75 • N, 83.38 • E), is strategically located in the central Indo-Gangetic Plain (IGP), near the foot hills of Himalayas. It having an area about 3483.8 sq. km. in which 2.38% area is covered by dense natural forests. The climate is warm and temperate, maximum and minimum temperature ranges between 09o to 43 o C where as average rainfall is 1227 mm. Soil is very fertile and is composed of Gangetic alluvium of Rapti and Rohini. In aspect of botany, this area is very interesting. In north, the Himalaya rise as a virtual wall beyond the snow line. Above the alluvial plain lies the Tarai strip, a seasonally marshy zone of sand and clay soils. As the northern Tarai region has higher rainfall than the plains and the falling rivers from the Himalaya slows down thereby spreading out in the flatter Tarai zone with the deposition of fertile silt which makes it reproductive land during the monsoon season and receding in the dry season. Thus, Tarai region has higher water level and is characterized by moist sub-tropical condition and a luxuriant turnover of green vegetation all the year around. This Tarai belt is well blessed and inhabited by tribal community inside the forest as well as around the forest area and is a natural paradise for ethno-botanical, mycological, plant pathological as well as work related with wildlife alone or interdisciplinary work. The general vegetation of the area is tropical deciduous type. However, some of the trees are evergreen and semi-evergreen. "Kushmi forest" is main point of attraction and specialty of the district Gorakhpur. Aforesaid ideal environmental factors support the luxurious growth of biodiversity.

METHODOLOGY

The present study was based on the field survey of Gorakhpur district of Uttar Pradesh. The voucher specimens of ethno-medicinal importance were collected, pressed, dried, preserved and mounted (Jain and Rao, 1976) with their ethno-therapeutic data and identified through the available taxonomic literature manuals and floras (Duthie, 1994 and Hooker, 1872-1897). The information was collected from herbal practitioners or local healers and other experienced persons. They were interviewed for local names, plant part used, method of preparation of medicine, dosages and their mode of administration. The specimens were maintained in the Herbarium of Department of Botany, M.M.M.P.G.College Bhatpar Rani Deoria. Information was validated using literatures (Yineger et al., 2007; Pande et al., 2007; Phondani et al., 2010; Tarik et al., 2014; Verma, 2014; Eshetu et al., 2015; Narayana and Narasimharao, 2015 and Mall and Tripathi, 2017) and findings were incorporated. The plants used in the treatment of various ailments are enumerated with correct botanical name followed by vernacular names and family as well as plant parts used and mode of administration in respect to simple preparation as well as compound preparation of medicine.

RESULT AND DISCUSSION

The perusal of the Table 1 revealed that 17 plant species help in curing diarrhoea and dysentery whereas 16 plants are being used for wounds, 14 plant species for removal of ecto-parasites while in case of indigestion and gas problem, 10 species play effective role in curing up. 9 plant species is being used in foot and mouth diseases and skin infection while 8 plant species to expel internal parasites. In case of curing bone fracture, cough and cold, food poisoning, retention of placenta, eye problems and stomachache seven plant species are being used up. Six plant species are revealed to be effective against mastitis, tympany, maggots wound, fever, lockjaw (tetanus) and haematuria.

Table 1. Plants with ethno-veterinary uses in different ailments and their mode of use.

S.No.	Disease/Di sorder	Plant sp.	Family	Plant part use	Method of use
1.	Anorexia	Trachyspermum ammi Spr Terminalia chebula Retz. Cuminum cyminum L. Raphanus sativus L.	Apiaceae Combretaceae Apiaceae Brassicaceae	Seed Bark Rhizome Seed	Seeds of Trachyspermum ammi and bark of Terminalia chebula, Rhizome of Cuminum cyminum (ajwain), seeds of Raphanus Sativus is grinded and mixed with black salt are applied to eat in anorexia when animal stops eating fodder.
2.	Anthrax	Abrus precatorius L Vitex negundo L Curculigo orchioides Gaertn. Piper nigrum L. Allium sativum L.	Papilinoidea Lamiaceae Hypoxidaceae Piperaceae Amaryllidaceae	Stem bark Leaves Tubers Seed Rhizome	Stem bark of Abrus precatorius (Rosery pea) along with leaves of Vitex negundo, tubers of Curculigo orchioides each 50 gm and 15 gm Piper nigrum and Allium sativum are grained and boiled in water so as to prepare decoction. The decoction is given orally twice in a day for a weak to cure anthrax, a serious disease that effect sheep and cows and sometimes people and can cause death.
3.	Analgesic	Cuscuta reflexa Roxb.	Cuscutaceae	Bark	Cuscuta reflexa Roxb., amarbel is used in bone fracture and lockjaw as an analgesic
4.	Anti-diuretic	Coriandrum sativum L. Lawsonia inermis L.	Apiaceae Lythraceae	Seed Leaves	The seed powder of Coriandrum sativum, dhania (Apiaceae) is mixed with paste of leaves of Lawsonia inermis along with small amount of water is given twice a day for a weak to animal to cure loose moti
5.	Antihelminthic	Achyranthus aspera L. Azadirachta indica A. Juss.	Amaranthaceae Meliaceae	Whole plant Leaves	The whole plant of Achyranthus aspera, latjeera is grinded to make paste and given orally along with sugar to buffaloes, cow, goat, sheep as anthelmintic and easy delivery. One hundred gm leaf paste of Azadirachta indica A, Juss., neem is administered twice in a day for about fi ve days to treat cough, lever diseases and as anthelmintic
6.	Appetizer	Cannabis sativa L. Cassia fistula	Cannabinaceae Caesalpiniaceae	Leaves Pods Leaves	Dried leaf powder of Cannabis sativa, bhang given orally works as appetizer. The paste of pods along with wheat bread is given twice in a day to cattle in the case of indigestion. The paste of leaves is mixed along with mustard oil and given twice in a day for a weak to improve appetite. The young leaves are cooked and given as purgative.

				Leaves	
				Pod	The paste of ripe pods is also administered along with water for purgative purpose. The pod is directly used.
7.	Alimentary disorder	Piper longum L.	Piperaceae	Fruit	Powder of fruit of Piper longum, pipili, pippali, pipar, pipulamul is mixed with water and applied to drink orally till cure when saliva comes from mouth due to poisoning. Leaf paste is externally used to cure germs and wounds.
		Prunus persica Betsch.	Rosaceae	Leaves	Seeds and rhizome of Zingiber officinale, Ferula asafoetida and fruit of Piper nigrum are mixed and grinded with water and the paste is used to cure blot which results gloating of stomach.
		Trachyspermum ammi Sprague	Apiaceae	Seed	Two hundred fifty gm seed powder is mixed with hundred ml Arachis hypogea oil and given twice a day for a week so as to cure cattle suffering from cough and cold.
		Vigna radiata L. Wiliz.	Papilinoideae	Seed	
		Arachis hypogea L.	Papilinoideae	Oil	
		Curcuma domestica L.	Papilinoideae	Oil	
		Zingiber officinale Roscoe	Zingiberaceae	Rhizome	Rhizome of Curcuma domestica, Zingiber officinale and bulb of Allium sativa, seeds of Trachyspermum ammi and Brassica juncea is milled and mixed with jaggery of Saccharum officinarum is provided to animal to eat for curing abdominal pain.
		Allium sativa L.	Zingiberaceae	Rhizome	
		Trachyspermum ammi Sprague	Zingiberaceae	Rhizome	
		Brassica juncea L. Vassili	Amarylilidaceae	Bulb	
		Matveievitch	Apiaceae	Bulb	
		Czernajew	Brassicaceae	Seed	
		Saccharum officinarum L.	Brassicaceae	Seed	
			Brassicaceae	Seed	
			Poaceae	Jaggery	
8.	Bone fracture	Achyranther aspera L.	Amaranthaceae	Root	A piece of fresh root of Achyranthus aspera, latjeera is grounded and the paste is applied so as to cure bone fracture.
		Agave americana L.	Agavaceae	Leaves fibre	Leaf fibres of Agave americana, ramban are used to tie the fractured bone.
		Amaranthus sp. L.	Amaranthaceae	Leaves	Amaranthus sp., chaulai is being used in bonefracture and wounds.
		Calerbrookia oppositifolia Sm.	Lamiaceae	Leaves	Calerbrookia oppositifolia, shamber, bhirnoli is being used in bone fracture, internal injury, sprain and muscular pull.
		Cuscuta reflexa Roxb	Cuscutaceae	Thin vine	Cuscuta reflexa, Amarbel is used in bone fracture and lockjaw.
		Lanea coromandelica Houtt. Mess	Anacardiaceae	Vegetative part	Lanea coromandelica, Mohin is used in bone fracture.
		Litsea glutinosa Lour Robinson	Lauriaceae	Vegetative part	Litsea glutinosa, Maida is used in stomach disorder and is bone fracture.

9.	Blot	Basella alba L. Acmella caulirrizza L. Lycopersicum esculentum L. Trachyspermum ammi Spr. Zingiber offi cinale Piper nigrum L. Ferula asafoetida L.	Basellaceae Asteraceae Solanaceae Cucurbitaceae Zingiberaceae Piperaceae Apiaceae	Vegetative part Flower Fruit Seed Rhizome Fruit Rhizome	The fresh vegetative paste and the flowers of Acmella caulirrizza are made in to paste and mixed together is squeezed. The filtrate solution is given thrice in a day orally to cure blot in cattle, sheep goat and equine. The fruit applied to cure blot where gloating of stomach take place Seeds of Trachyspermum ammi, rhizome of Zingier offi cinale, Ferula asafoetida and fruit of Piper nigrum are mixed and grinded with water and the paste is used to cure blot which results gloating of stomach
10.	Boils	Bauhinia vahlii Weight and Arnott. Dioscorea bulbifera L.	Caesalpiniaceae Dioscoreaceae	Leaves Leaves	Bauhinia vahlii is used in hoof disease, boils pimples, carbuncle and post calving care. Dioscorea bulbifera is used in ear diseases, pimples and boil.
11.	Broken horn	Curcuma longa L. Brassica nigra L. Curcuma domestica L. Lens culinaris Medik. Tagetes erecta L.	Zingiberaceae Brassicaceae Zingiberaceae Papilinoideae Asteraceae	Rhizome Oil Rhizome Seed Leaves	Fine paste of rhizome is mixed with pure mustard oil of Brassica nigra, Black mustard. It is applied on the mischief parts of cattle horn. The rhizome paste is applied externally to the broken horn. Lens culinaris Medik., Lentil, Masoor is used to remove sterility and cure of broken horn. The fresh leaves are gound to make paste. The paste is squeezed, the juice so obtained is applied extremely in broken horn where there is shelling off the outer of horn and conconitant bleeding.
12.	Burn	Capsicum annum L. Lathyrus sp. L. Solanum Tuberosum Triticum aestivum L	Solanaceae Papilinoideae Solanaceae Poaceae	Fruit Pod Under ground stem Seed	Capsicum annum, Mircha is being used in burn Lathyrus sp., Sweet pea is used when there is burn. Solanum tuberosum, Aalu is used in burns Seeds are grinded and a paste is made. It is applied externally on burns on the skin.
13.	Carbuncle	Bauhinia vahlii weight and Arnott.	Caesalpiniaceae	Flower	Flower is used in hoof disease, boils pimples, carbuncle and post calving care.
14.	Cold	Datura metel L. Ocimum sanctum L.	Solanaceae Lamiaceae	Fruit Leaves	About 100 gm of ripe fruits of Datura metel, Hindu dhatura are made into paste along with water and given to cattle twice a day for a weak to cure cold. Three hundred and fifty gm fresh leaves (Shyamatulsi) are boiled in 500 ml water for preparation of decoction. The decoction so obtained

		Triticum aestivum L.	Poaceae	Seed	is given to cattle twice in a day to cure cough and cold.
		Vigna radiata R. Arachis hypogaea L.	Papilinoideae	Seed Oil	Seeds made into powder and administered orally to cow to cure common cold and dysentery. Two hundred fifty gm seed powder of Vigna radiata R. Witezek, Mung bean is mixed with hundred ml Arachis hypogaea oil and given twice a day for a weak so as to cure cattle suffering from cough and cold.
15.	Cough	Allium cepa L.	Liliaceae	Bulb	The paste of onion, Allium cepa, Pyaz, bulb mixed with mustered oil given orally thrice for three weeks for the treatment of cough.
		Dendrocalamus strictus Roxb. Nees	Poaceae	Leaves	Green leaves of Dendrocalamus strictus (Roxb.) Nees., Bans, Bamboo, Calcutta bamboo are grinded with seeds of Hordeum vulgare and is administered along with water to cattle to cure cough.
		Hordeum vulgare L.	Poaceae	Seed	Three hundred and fifty gm fresh leaves of (Shyamatuli) is boiled in 500 ml water for preparation of decoction. The decoction so obtained is given to cattle twice in a day to cure cough and cold.
		Ocimum sanctum L.	Lamiaceae	Leave	Linum usitatissimum, also is used in dysentery, cold, cough and as tonic.
		Linum usitatissimum L.	Linaceae	Seed	Seeds of Oryza sativa, dhan are boiled with water and the extract is applied orally to cure cough.
		Oryza sativa L.	Poaceae	Seed	Saccharum sp., ganna is used when there is cough.
		Saccharum officinarum L.	Poaceae	Stem	Juice of fresh leaves of Tribulus terrestris, Bindii, Devil's thorn is given to animal in case of colic and chronic cough
		Tribulus terrestris L.	Zygophyllaceae	Leave	Two hundred fifty gm seed powder of Vigna radiata, Mung bean is mixed with hundred ml Arachis hypogaea oil and given twice a day for a week to cure cattle suffering from cough and cold.
		Vigna radiata (L.) Wiliz	Papilinoideae	Seed	
		Arachis hypogaea L.	Papilinoideae	Oil	
16.	Cataract	Ampelocissus latifolia (Roxb.) Planch	Vitaceae	Foliage	Ampelocissus latifolia, Wild grape is reported to be used in cataract
		Tridax procumbens L.	Asteraceae	Leaves	Used in cataract.
17.	Constipation	Ficus religiosa L.	Moraceae	Stem Bark	The paste of stem bark of Ficus religiosa, Peepal is given against constipation.
		Plumbago zeylanica L.	Plumbaginaceae		Used in constipation

18.	Continual release of urine	Cucumis melo Duth and Full.	Cucurbitaceae	Fruit	Used in continual release of urine, heat stroke, indigestion.
19.	Conjunctivitis	Cucurbita maxima Duch ex Lam Cynodon dactylon Pers.	Cucurbitaceae Poaceae	Fruit Leaves	Used in conjunctivitis One tea spoonful leaf juice of Cynodon dactylon Pers., Doob ghas is dropped in each eye in morning and evening for three days or so for the treatment of conjunctivitis.
20.	Chicken pox	Phyllanthus emblica L. Plantago ovata Forssk.	Euphorbiaceae Plantaginaceae	Fruit Seed husk	Fruit is used in chicken pox Used in chickenpox and to expel internal parasites.

Five plant species are related to overcome the sun burn, four plant species were revealed to overcome the problems of rheumatism and lactation. Also, four plant species are used for easy delivery, snake bite, galactagogue, flatulence, eczema, to induce fertility, in loose motion and broken horn. Three plant species are used to overcome dyspepsia, arthiritis, hoof diseases, sun stroke, neck rose, to stop bleeding, ear disease and debility. In case of anthelmintic, as epitizer, boils, blot, cataract, conjunctivitis, chicken pox, colic disorder, dysentery, frequent loose motion, food suffering from infection, internal injury, itching, jaundice, lactation, liver disease, pimples, swelling, twitching, vomiting, in dog bite, to remove sterility, in bronchitis and as anti-diuretic, 2 plant species are being used up where as in case of anthrax, anorexia, burn, chronic cough, constipation, cold cough, carbuncle, darissa, dysurea, dysphtheria, fasciitis, febrifuge, hepatitis, internal heat, intestinal disorder, irritation, mange, mouth blisters, muscular pull, neck injury, post calvin care, paralysis, pneumonia, as purgative, ranikhet disease, render pest, sprain, scabies, shoulder injury, stomach mange and ulcer, throat swelling, as tonic, tonsils, tongue sore, udder problem, urinary troubles, yolk galls and yolk sore, only one plant species were found to be being

used in ailments. Out of 134 families having 600 genera and 1024 plant species are found in Gorakhpur (Saini, 2005). Of these the plants of 57 families represented by 106 genera of 181 plant species are found to be being used in various veterinary ailments. Acanthaceae is being represented by 3 genera and 5 species; Asteraceae by 7 genera and 9 species, Amaranthaceae by 2 genera and 4 species; Apiaceae by 4 genera and species each; Brassicaceae by 2 genera and 4 species; Caesalpinaceae by 4 genera and 6 species; Cucurbitaceae by 6 genera and 7 species; Moraceae by 2 genera and 5 species; Lamiaceae by 3 genera and species; Papilionaceae is represented by 9 genera and 10 species; Menispermaceae by 2 genera and three species, Poaceae by 4 genera and 7 species; Solanaceae by 3 genera and 6 species; while Meliaceae, Sapindaceae, Anacardiaceae, Rosaceae, Lytharaceae, Apocyanaceae, Asclepiadaceae, Piperaceae, Euphorbiaceae and Zingiberaceae by 2 genera and 2 species each; Mimosaceae, Combricaceae, Rubiaceae, Dioscoreaceae and Cyperaceae by 1 genera and 2 species each; whereas rest 28 families, viz., Annonaceae, Fumariaceae, Cappariaceae, Caryophyllaceae, Malvaceae, Linaceae, Oxalidaceae, Rutaceae, Mitaceae, Leaceae, Myrtaceae, Punicaceae, Cactaceae, Plumbaginaceae, Oleaceae, Buddlejaceae, Cuscutaceae, Bignoniaceae, Verbenaceae, Plantaginaceae, Nyctagenaceae, Chenopodiaceae, Polygonaceae, Louraceae, Loranthaceae, Cannaceae, Agavaceae and Araceae are found to be represented with single genera and species each (Fig. 2). About 60 percent of the world's population is using the traditional medicines for health care which not only includes rural areas but even in developing and developed countries, where use of modern medicine is predominant. The traditional method of medicine involves the use of medicinal plants, minerals, and organic matter. Application of plants in the medicinal field is not a new thought but rather an inherited process. Indian

system of medicine had derived many of their curative tools from these plants. About 45,000 plant species are present in India having a high concentration in the regions of Eastern Himalayas, Western Ghats and Andaman & Nicobar Islands. Roughly 3,000 plants have been well documented of being used as medicine for various diseases and related problems but for traditional practitioners this amount is of greater than 6,000. India is one such country which is the largest producer of medicinal herbs and so it may be called as botanical garden of the world (Mall and Tripathi, 2017). This study showed that the study area is rich in plants having ethno-medicinal importance which may help in overcoming various diseases and its related issues. Though there is availability of modern medicinal system for treatment for various diseases but the local people are still dependent on the traditional medicinal system. The knowledge of traditional healthcare is limited to traditional healers, who are residing in rural areas. Thus there is a need for preserving this traditional knowledge in a form of documentation before it is too late. This study also enhances the need for further investigation on aspects like biochemical and pharmaceuticals as one of the major problems with herbal medicines is that their active ingredients are not very well known. Hence, if active component and molecular interaction is known of these plants, it will help in analysing the therapeutic efficacy of various medicines being used. It is also important to pay attention on preserving the rich diversity of nature in the study area for conservation of mankind and for sustenance of life on the earth.

CONCLUSION

This study showed that there is wide scope for further scientific work as still there are some plants unexplored for their medicinal value. Information on Ethno-medicinal plants may provide a base to explore the new compounds associated with phyto-chemistry and pharmacology. It is even important to consider that the floristic diversity and natural beauty of the study area is the most precious gift that nature has bestowed on our planet Earth and thus one must pay attention to the growing medicinal plants in these areas for its sustainable exploitation cultivation and even its conservation for the sake of mankind as it is well known that "Nature Protects if She is Protected".

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