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Exploration of ethno-veterinary medicinal plants used by tribal and rural communities of Nainital District, Uttarakhand, India

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ABSTRACT

Ethno-Veterinary Medicine (EVM) or Veterinary Anthropology refers to holistic and interdisciplinary study of traditional knowledge, skills, methods, practices and folk beliefs of the people about the health care, healthful husbandry and production of livestock (Yadav, 2014, Mc Corkle, 1986, 1996). This study aims to document information about ethno-botanical information and its traditional use by the local inhabitant for the treatment of livestock in different villages of Nainital district, Uttarakhand. Traditional use of plant and plant resources has a long history in Uttarakhand and its use is rapidly increasing due to having no side effects, easily available at affordable prices. Field surveys were conducted in the various villages/places in Nainital district between 2013-2015. In general Itching, skin diseases, bleeding, foot and mouth disease, gastrointestinal helminthiasis, mange, myiasis, pain, pediculosis, pneumonia, tick infestation and uterine prolapsed, diarrhoea, afterbirth retention, poisoning, indigestion, liver problem, cough, fever, bone fracture were some common conditions/ailments of animals for which traditional ethno-veterinary prescriptions are usually being used in the area. The dependence of humans and livestock on this rich plant diversity is well known phenomenon since time immemorial. In present investigation a total of 38 plant species from 26 different families were recorded as Ethno-Veterinary plants from the study area. Out of 38 species 9 species were tree and rest all species were herbs.

Keywords: Ethno-Veterinary Medicine (EVM), ethno-botanical information, Ethno-Veterinary plants, livestock, folk beliefs, socioeconomic value, Traditional hillers.

INTRODUCTION

Indian Himalayan region includes the parts of trans, northwest, west, central and east Himalaya. This region covers approximately an area of 4,19,873 Km^2. with 2500 Km length and 240 Km width (Samant, et al 1998). The Himalaya is one of the most diversified and complex geological system among the global mountain system. It separates the northern part of Asian continent from South Asia (Zobel, 1997). This region is also known as a 'water tower of the earth', this is due to the presence of water bodies throughout the area, it is estimated that 10–20% of the area is covered by glaciers and remaining 30–40% under seasonal snow cover (Tewari, 2016, Butola, 2008).The unique climatic conditions, physiography and soil characteristics of the area has resulted in a variety of habitats and a significant biological and cultural diversity. The dependence of humans and livestock on this rich plant diversity is well known phenomenon since time immemorial. (Samant and Dhar, 1997). Uttarakhand encompasses an area of 53,485 sq. km., which accounts for nearly 15.5 per cent of the total geographical area of Western Himalaya. Uttaranchal state lies between 28^0 42' to 310 28' N; 77^0 35' to 81^0 o5' E and comprise of 13 district of the Central Himalayas. The major part of this region is mountainous. The region covers about 38,000 sq km and comprises of 3 border district, namely Pithoragarh, Chamoli and Uttarkashi; 7 inner districts: Almora, Nainital, Bageshwar, Champawat, Pauri, Tehri, Rudrapryag, Dehradun, Udham Singh Nagar, and Hardwar. The Nainital district which is located between 80º14' and 78º80' east longitude and 29º00' and 29º05' north latitude. On the northern side lies the Himalayan ranges

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while on the southern side lies the plains making the resultant climate of the district enjoyable one.

Ethno -veterinary is a branch of science which deals with the study of traditional knowledge, methods, skills and practices used for treating various ailments of animals. India is a land possessing rich biodiversity and is counted amongst the mega diversity regions of the world having rich biodiversity with great emporia of ethno-botanical wealth, and traditional knowledge. In India, the concept of art of caring for livestock was provided by the sacred texts of the vedic region. And this rich heritage of traditional knowledge is passes from one generation to another/period through Ayurvrdic, Unani, and Homoeopathy system of medicines which is used since time immemorial. In India, the earliest information on the art of caring for animals was provided by the sacred text of Vedic region and it is used since time immemorial. The wide spread use of traditional medicine could be attributed to cultural acceptability, economic affordability and efficacy against certain type of diseases as compared to modern medicines. Thus, different local communities in countries across the world have indigenous experience in various medicinal plants where they use their perceptions and experiences to categorize plants and plant parts to be used when dealing with different ailments (Partiban et al.,2016, Omoruyi et al., 2012).

Nainital is a very rich biodiversity place of Uttarakhand state has a very rich heritage of traditional knowledge, skills, methods, practices and folk beliefs of the local inhabitants about the health care, healthful husbandry and production of livestock due to their long-term association with forest and forest resources. The continuous interest in herbal medicine in the Uttarakhand, Indian healthcare system could be attributed to these reasons. Firstly inadequate accesses to allopathic medicines and western forms of treatments because medical services are not always provided. Secondly, there is lack of effective modern synthetic drugs for complete eradication of some ailments such as Ebola and/or HIV/AIDS, although they spread worldwide, disproportionately affects Africa more than other areas in the world And thirdly In India, mainly in hilly areas and regions there is a lack and irregularity of transport system due to poor developed roads system, thus urgent medical facilities are not always available. (Noel et al., 2016, Mohomoodally, 2013).

MATERIALS AND METHODS

Description of the study area:

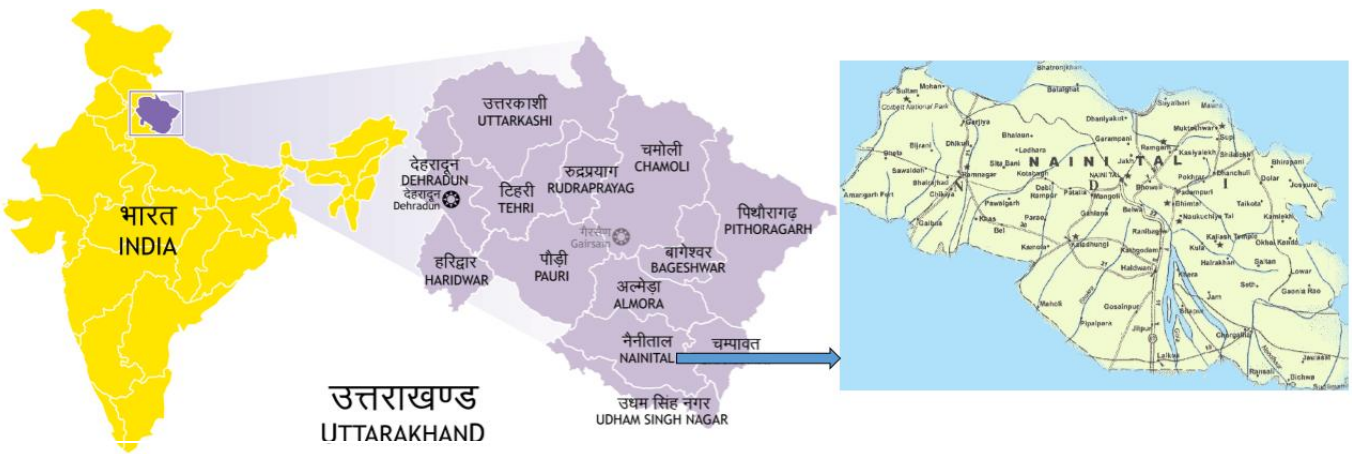
The study was carried out in Nainital district (Figure-1) which is located between 80º14' and 78º80' east longitude and 29º00' and 29º05' north latitude. On the northern side lies the Himalayan ranges while on the southern side lies the plains making the resultant climate of the district enjoyable one.

In the Uttarakhand state of India regular field survey was conducted during 2013-2015 to document the list of important ethno-botanical plants species curing the number of ailments and diseases of animals and livestocks. Efforts were made to collect the plant materials in flowering and fruiting conditions for the correct botanical identification (Somkuwar et al., 2015). Data were gathered via simple observation and semi-structured interview, guided questionnaires, and direct observations (Babbie,1995; Casley and Kumar, 1988; Knoke and Kuklinski, 1982). A structured interview was then administered to 210 respondents from nineteen villages within Nainital district. The respondents were Female (66%), male (34%) during the interview. The villages included Rusi, Gethiya, Aaloo khet, Baldiyakhan, Krishnapur, Shyamkhet, Naryan nagar, Bhowali gaon, Naina gaon, Manora, Mangoli, Bhumidhar, Mehra gaon, Belwakhan, Devidhura, Koon, Sauliya gaon, Takula, and Aarukhan. The respondents were interviewed in their own houses and in nearby places falling within the study area where they would normally go to collect important and useful ethno-botanical plant species to cure the ailments and diseases of their ill livestocks/ animals.

Socioeconomic survey

These methods were used as a means to gather more reliable information, add depth of understanding, and reduce error (Webb et al., 1966). Data were gathered via simple observation and semi-structured interview, guided questionnaires, and direct observations (Babbie,1995; Casley and Kumar, 1988; Knoke and Kuklinski, 1982). A structured interview was then administered to 210 respondents from fourteen villages within Nainital district. The respondents were interviewed in their own houses and in nearby places falling within the study area where they would normally

Figure-1.Study area: Nainital district of Uttarakhand, India



go to collect important and useful ethno-botanical plant species to cure the ailments and diseases of their ill livestocks/animals. The questions were aimed at determining types of livestock reared in the district and the plant species grazed by cattle, and perceptions about ethno-medicinal plant species availability. Interviews were conducted in the local language (Kumauni). The collected specimens of Ethno-Veterinary plants/trees were identified with the help of relevant available taxonomic literature and Herbaria, CCRAS Tarikhet and Department of Botany, D.S.B. Campus, Nainital Uttarakhand were also consulted. The vernacular names were selected as mentioned by two or more of the people. The voucher specimens were deposited at Departmental Herbarium, Department of Botany, D.S.B. Campus, Nainital. The information, thus collected, was used to express species diversity for each plant community type. The species so collected were preserved for taxonomic identification following Jain and Rao (1977) and identified following Gupta (1968) and research publications. The identified specimens were further confirmed by comparing them with reference specimens preserved in the herbaria of Kumaun University, Nainital. The identified species were further classified according to their local names, different parts used traditionally and the disease treatment.

RESULTS AND DISCUSSION

Agriculture with animal husbandry is prevalent profession of rural people of India, Himalayan Region. Diseases are basic problems of man and animals and its cure through ethno-medicinal plant species is comes through Ayurvedic, Unani, and Homoeopathy system of medicines which is used since time immemorial (Pandey et al., 2007, Tiwari, 2010; Rajendra Chary Vijayagiri and Estari Mamidala, 2012). Ethno-veterinary practices used by the people are interesting, and have been practiced since long back. In general bleeding, foot and mouth disease, Dysentery, fever, constipation, conjunctivitis, gastrointestinal, helminthiasis, mange, myiasis, diarrhoea, pediculosis, pneumonia, tick infection, uterine prolapsed, epilepsy, haematuria, hoof disease, stomach ache, were some common diseases/ailments of animals for which traditional ethno-veterinary prescriptions are usually being used in the area. According to the local inhabitants of the area, Dysentery, constipation, conjunctivitis, gastrointestinal, helminthiasis, myiasis, diarrhoea, pediculosis, pneumonia, tick infestation, are the ten disease which is very common problem in present study area and thus the traditional medicines is used by the traditional healers of villages to cure the diseases (Bhatt et al., 2013; Prasad Paindla et al, 2013).

Different plant families recorded:

The present study reveals that Nainital district contains 38 ethno-medicinally important plant species to cure the common ailments and diseases of animals of local inhabitants of the villages. The 38 ethno-medicinally important plants species belongs to 26 different families (Hippocastanaceae, Ulmaceae, Urticaceae, Betulaceae, Bombaceae, Poaceae, Ranunculaceae, Violaceae, Linaceae, Fabaceae, Rosaceae, Saxifragaceae, Cucurbitaceae, Cactaceae, Apiaceae, Valerianaceae, Asteraceae, Gentianaceae, Solanaceae, Lamiaceae, Nyctaginaceae, Cannabaceae, Zingiberaceae, Menispermaceae, Araceae and Pinaceae). The most represented family was Urticaceae and Lamiaceae has the highest number of (4 species each) followed by Asteraceae (3), Poaceae, Violaceae, Valerianaceae, Menispermaceae with each two species, Other families with one species each (Table-1,2).

Table. No.2. Percentage of plant families recorded

S.No	Name of the families	Genus	No. of species	%of species
1.	Hippocastanaceae	1	1	2.85%
2.	Ulmaceae	1	1	2.85%
3.	Betulaceae	1	1	2.85%
4.	Poaceae	2	2	5.71%
5.	Ranunculaceae	1	1	2.85%
6.	Violaceae	1	2	2.85%
7.	Linaceae	1	1	2.85%
8.	Fabaceae	1	1	2.85%
9.	Rosaceae	1	1	2.85%
10.	Saxifragaceae	1	1	2.85%
11.	Cucurbitaceae	1	1	2.85%
12.	Cactaceae	1	1	2.85%
13.	Apiaceae	1	1	2.85%
14.	Valerianaceae	1	2	2.85%
15.	Gentianaceae	1	1	2.85%
16.	Solanaceae	1	1	2.85%
17.	Lamiaceae	4	4	11.42%
18.	Nyctaginaceae	1	1	2.85%
19.	Cannabaceae	1	1	2.85%
20.	Zingiberaceae	1	1	2.85%
21.	Menispermaceae	2	2	5.71%
22.	Araceae	1	1	2.85%
23.	Pinaceae	1	1	2.85%
24.	Bombaceae	1	1	2.85%
25.	Urticaceae	3	4	8.57%
26.	Asteraceae	3	3	8.57%
Total		35	38	

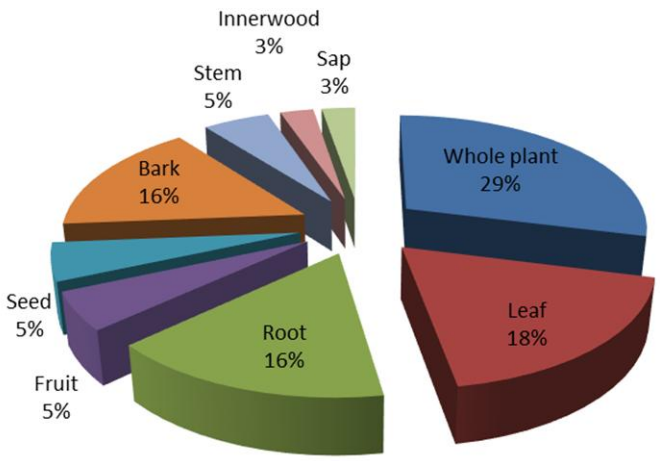
The plants used for medicinal purposes in the regions are presented in with Table.no. 1 and 2 and its graphical representation with relevant information (Figure-2). The further studies aimed to conserve traditional medicine and economic welfare of rural people of the study area, and such traditional knowledge is a wealth for human being.

Percentage (%) of plant parts used for indigenous ethno-medicinal purpose:

Plant parts used by the traditional healers of villages of Nainital district to treat various ailments and diseases were mainly leaves, bark and root. Aerial parts of plant and whole plants were also used in case of small

herbaceous plants. Mainly the whole plant i.e (28.9%) is frequently utilized in the study area followed by leaves (18.8%) for the preparation of herbal medicines ,it was followed by bark (15.78%), root (15.7%), stem, fruit and seed each contributes (5.2%), and Inner wood and sap each (2.6%) (Fig-2). All over the world tribal communities, and peoples uses mainly leaves for the preparation of herbal and home-made medicines (Partiban et al.,2016, Ullah et al., 2013; Swapna Gurrapu and Estari Mamidala, 2016. Morvin Yabesh et al., 2014; Prabhu et al., 2014; Vijayakumar et al., 2015).

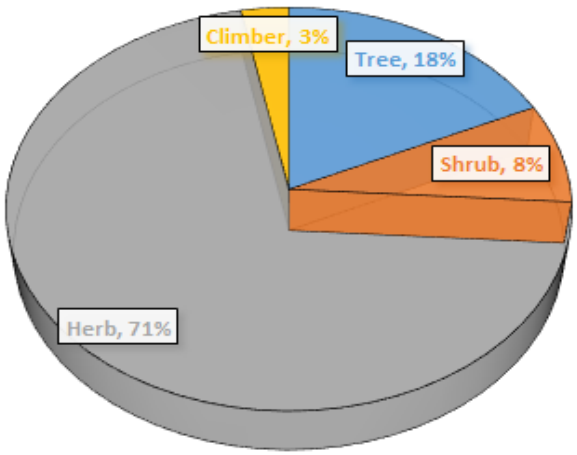
Figure-2 Percentage of parts used.



Habit of medicinal plants surveyed

In the current survey, 71% of the reported species are herb. Other highly reported species are tree (7%), climber (1%) and shrub (3%) (Fig-3).

Figure-3. Habit of medicinal plants surveyed



Traditional healers used herbs and trees most commonly as medicine due to the availability in nature.

Here, in the study survey we found that Stomach ache, Foot and mouth disease, Fever, Constipation, Conjunctivitis, Gastrointestinal were the six common diseases which affects almost the total surveyed villages (Table-3) followed by Bleeding, Uterine prolapsed each affects 18 villages out of total 19 villages, then followed by Pneumonia, Diarrhoea and tick infection.

Table-3. Percentage of total villages frequently affected/suffering from the very common ailments

S. No	Very common diseases	No. of villages affected out of 19 villages
1.	Bleeding	18
2.	Helminthiasis	9
3.	Mange	11
4.	Myiasis	12
5.	Diarrhoea	16
6.	Pediculosis	13
7.	Pneumonia	17
8.	Tick infection	16
9.	Uterine prolapsed	18
10.	Epilepsy	7
11.	Haematuria	11
12.	Hoof disease	13
13.	Stomach ache	19
14.	Foot and mouth diseases	19
15	Dysentery	13
16.	Fever	19
17.	Constipation	19
18.	Conjunctivitis	19
19	Gastrointestinal	19

CONCLUSION

India has got a rich heritage of traditional knowledge in the field of ethnoveterinary medicine and practices, skills, methods, and folk beliefs, but now days the knowledge regarding ethno veterinary medicine is decaying fast due to the advancement of modern veterinary medicines. But (EVM) is still persistence in most parts of Uttarakhand due to some factors which include cost effectiveness, inaccessibility, easily availability, no side effects and other factors linked with the modern veterinary system. The people living in different parts of Nainital region have developed excellent traditional knowledge due to long term association and cooperation with forests. The local inhabitants of the district are utilizing or practicing many ancient traditional methods of healing for their domestic animals. Livestock health is a major issue of concern now days so, we have to protect our big heritage of cultural /traditional knowledge beside the rich biodiversity.

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Conflict of Interests

Authors declare that there is no conflict of interests regarding the publication of this paper.

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