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ETHNOVETERINARY USES OF MEDICINAL PLANTS AMONG TRADITIONAL HERBAL HEALERS IN ALAKNANDA CATCHMENT OF UTTARAKHAND, INDIA

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Abstract

The people of far-flung rural areas still depend to a large extent upon plants and household remedies for curing veterinary ailments. The folk knowledge of ethnoveterinary medicine and its significance has been identified by the traditional communities through a process of experience over hundreds of years. The paper deals with 34 ailments commonly found in nine different categories of livestock/animals (i e. buffalo, cow, oxen, sheep, goat, horse, mule, dog and cat) and their treatment with 73 medicinal plant species belonging to 70 genera and 45 families that occur in forests as well as close vicinity of the rural settlements. Out of the total population, majority of the people (more than 80%) was found dependent on traditional (herbal) system of treatments practiced by local herbal healers (Pashu Vaidyas), while rest of the people preferred modern (allopathic) system of treatments for curing veterinary ailments. In this study we observed that old aged people have more knowledge and experience particularly in remote areas for curing veterinary ailments. The traditional system of treatment is one of the most important prevailing systems in the area where modern veterinary health care facilities are rare or in very poor conditions.

Keywords: Ethnoveterinary uses, Medicinal plants, Veterinary ailments, Livestock, Traditional herbal healers, Alaknanda catchment

Introduction

Animal husbandry is the backbone of the rural sector of the Himalayan region and development of this sector may improve the living standard of rural communities. Livestock provides a wide range of services and products including animal power, wool and supplementary nutrition (Maikhuri, 1992). In spite of environmental compulsions and hardships of remote areas, the spectrum of livestock diversity in this region is rich and varied. This is evident from the occurrence of different breeds of sheep, goats, cattle, horses, mules, buffaloes and poultry etc. In these remote areas, where modern veterinary health curative systems are very poor, the traditional societies have evolved several indigenous veterinary health care practices to maintain a variety of livestock populations (Palni et al., 1998; Samal et al., 2004).

Ethnoveterinary medicines are used extensively and quite effectively for primary health care treatment to make domestic animals productive and healthy. The indigenous knowledge of the veterinary health care system acquired by traditional herbal healers (Pashu Vaidyas) is orally transformed from one generation to other. Over centuries, people have developed their own system of keeping animals healthy and productive using age-old home remedies, surgical and manipulative techniques, husbandry strategies and associated magico-religious practices. Cost, inaccessibility and other problems like side effects of modern animal health care system have encouraged the local people to rely on traditional rural wisdom. Ethnoveterinary practices are often cheap, safe, long time tested and based on local resources and strengths. These can provide useful alternatives to

modern animal health care systems (Kumar, 2002; McCorkle, 1995).

Alaknanda catchment and its adjoining areas have a rich tradition of indigenous medicines and traditional health care practices for curing various diseases of domestic animals. Besides the classical Ayurveda, traditional system of medicine is still popular all over India (Kala et al., 2005). Most of these systems are unique and are often known only to a few individuals and communities. These systems of healing domestic animals make use of many medicinal plants, most of which are endemic and some of them are at the verge of extinction due to over exploitation (Kala, 2005; Maikhuri et al., 1998). These indigenous practices play a crucial role in the livestock health care of traditional societies. However, due to changing socio-economic and cultural values of the traditional communities, the indigenous practices of livestock rearing is gradually declining from the region (Farooquee et al., 1996; Purohit et al., 2002).

The purpose of the present study was to (i) unravel the mode of application/use pattern of the medicine prepared from plants, and (ii) quantify the dependence of the local people on herbal and allopathic systems of veterinary health care.

Materials and Methods

Study area

Uttarakhand state is known for the origin of sacred rivers like the Ganga, Bhagirathi and Alaknanda. The river Alaknanda has its source in the Satopanth and Bhagirath kharak glaciers, which rise from the eastern slope of Chaukhamba peak (7138masl.) of Rudraprayag district in Uttarakhand state of India. The catchment of Alaknanda river extends between 29^0 58' 34" to 31^0 04' 20" N latitudes and 78^0 34' 31" to 80^0 17' 54" E longitudes. It narrows down towards west and tapers off at Devprayag making confluence with the river Bhagirathi and forms the holy Ganga. The Alaknanda catchment stretches in four districts of Garhwal region of Uttarakhand viz., Chamoli, Rudraprayag, Pauri and Tehri. The present study was carried out in a total of 107 villages in 8 valleys (i e. Niti, Urgam, Berahi, Nandakini, Pinder, Mandakini, Bhilangana and Binsar) covering 4 districts (i.e. Chamoli, Rudraprayag, Tehri and Pauri) in Alaknanda catchment and its adjoining areas of Uttarakhand. These areas are inhabited by tribal and non-tribal communities (Figure 1). They mainly occupy the forested regions and have a total population of 27,295 with average family size of 5-6 persons. The rural settlements are located in the altitudinal limit of 1400 to 3000 m asl. These communities have their own culture, tradition and religious beliefs. The major occupation of these communities has been sheep and goat rearing and farming, with peasant farming taking primacy over pastoralism in contemporary time. Almost all the households are involved in agriculture through subsistence farming.

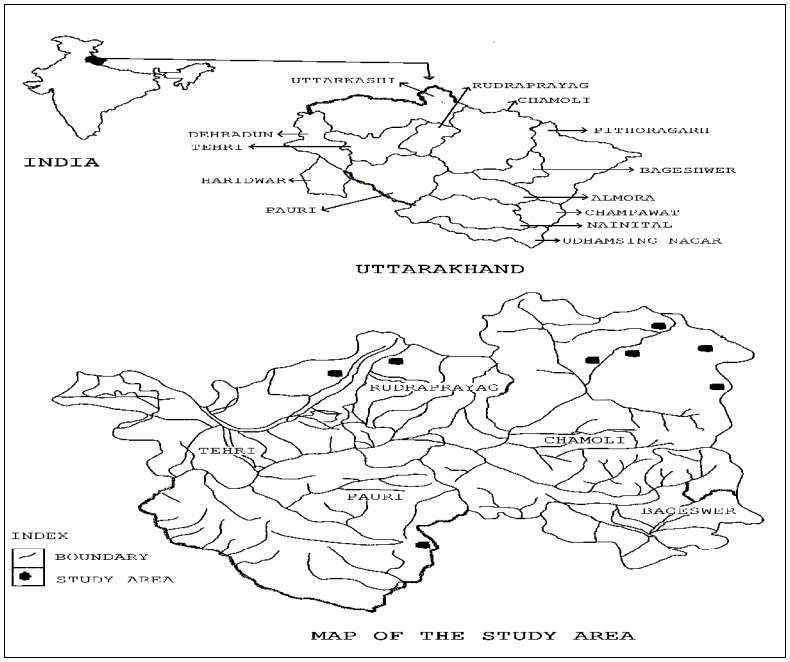

Figure 1: Location map of the study area in Uttarakhand, India

Data collection

In-depth survey was undertaken from April 2007 to December 2008 to collect data and information on the use of different medicinal plant species which are used for curing animal ailments by traditional herbal healers (Pashu Vaidyas) in various remote valleys of the Alaknanda catchment of Uttarakhand. Ethnoveterinary information acquired by tribal and non-tribal communities was collected using semi-structured and structured questionnaires. Extensive field visits were made to local herbal healers for gathering information and for identification and places/localities/habitat of occurrence of medicinal plants in the study area and mode of their utilization for curing particular animal ailment. Randomly selected households and headman, elders, traditional healers, local people and veterinary doctors of the study areas were consulted and interviewed to understand the dependency on traditional (Herbal) and modern (Allopathic) system of treatments for curing animal ailments among various categories of animals. Perception of local people during field trips were recorded under different categories of socio-demographic characters' such as gender, education, age groups and healing experience so as to assess the responses as well as their preferences to know the status of traditional animal health care system.

Besides, workshops and village level meetings in different localities of the study area were conducted time and again in which various groups of people (Traditional herbal healers, local people, Ayurvedacharya, medical doctors, scientists, social workers and school teachers) were invited to participate and to help in documenting their indigenous knowledge on medicinal plants used for managing domestic animal diseases. The information on the use of specific plants species and preparation of herbal medicine and application practices for curing animal ailments collected during the field visit as well as during the workshops/meetings were cross-checked more than two times. The collected plant specimens were identified with the help of regional floras (Naithani, 1985; Gaur, 1999) and taxonomists. Voucher specimens are deposited in the herbarium of G. B. Pant Institute of Himalayan Environment and Development, Garhwal Unit, Srinagar Garhwal, Uttarakhand, India.

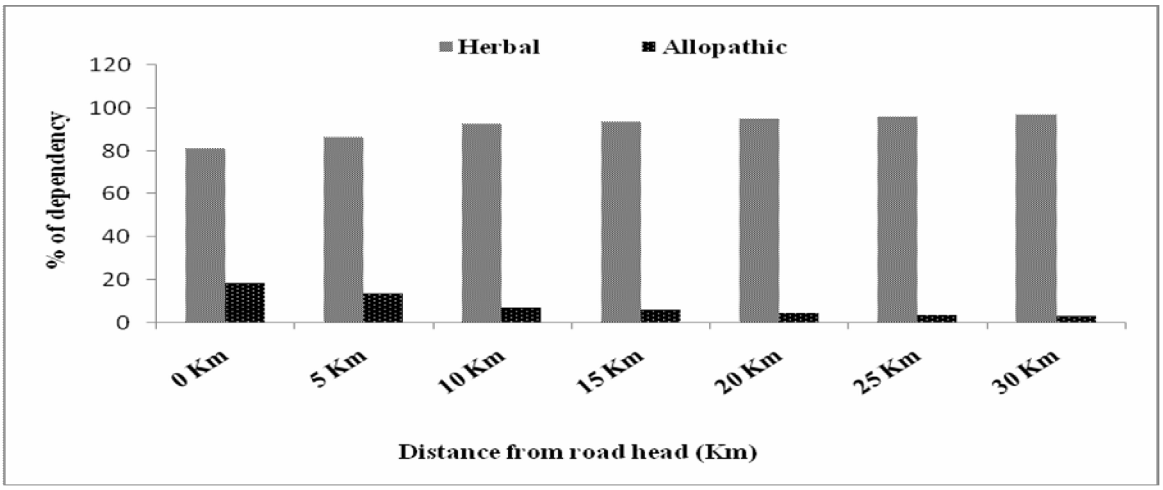

Figure 2: Dependency on herbal and allopathic system of treatments away from the road head for curing veterinary ailments

Results and Discussion

The present study showed that the local people of Alaknanda catchment use several ethnoveterinary practices for curing animal ailments. A total of 73 medicinal plant species (i.e. *Trachyspermum ammi, Lyonia ovalifolia, Curcuma domestica, Bombax ceiba, Vigna mungo, Coriandrum sativum, Allium cepa, Zingiber officinale, Angelica glauca, Piper nigrum, Sesamum orientale* etc.*)* of different plant groups (i.e., 41 herbs, 10 shrubs, 18 trees and 4 climbers) belonging to 70 genera and 45 families are being used extensively for curing 34 animal ailments (i.e., bloat, mastitis, poisoning, foot and mouth disease, dermatitis, cataract, hematuria, arthritis, burning, pneumonia, dysentery, sprain etc.) commonly found in nine different type of livestock/animals (i.e. buffalo, cow, oxen, sheep, goat, horse, mule, dog and cat). All these medicinal plant species are collected by local communities from the surrounding areas, forests and alpine meadows and are being used as remedies for various animal ailments. About 33 plant species are used for curing more than one disease, whereas about 8 medicinal plant species are used alone to cure abdominal pain and related diseases (Table 1). The study revealed

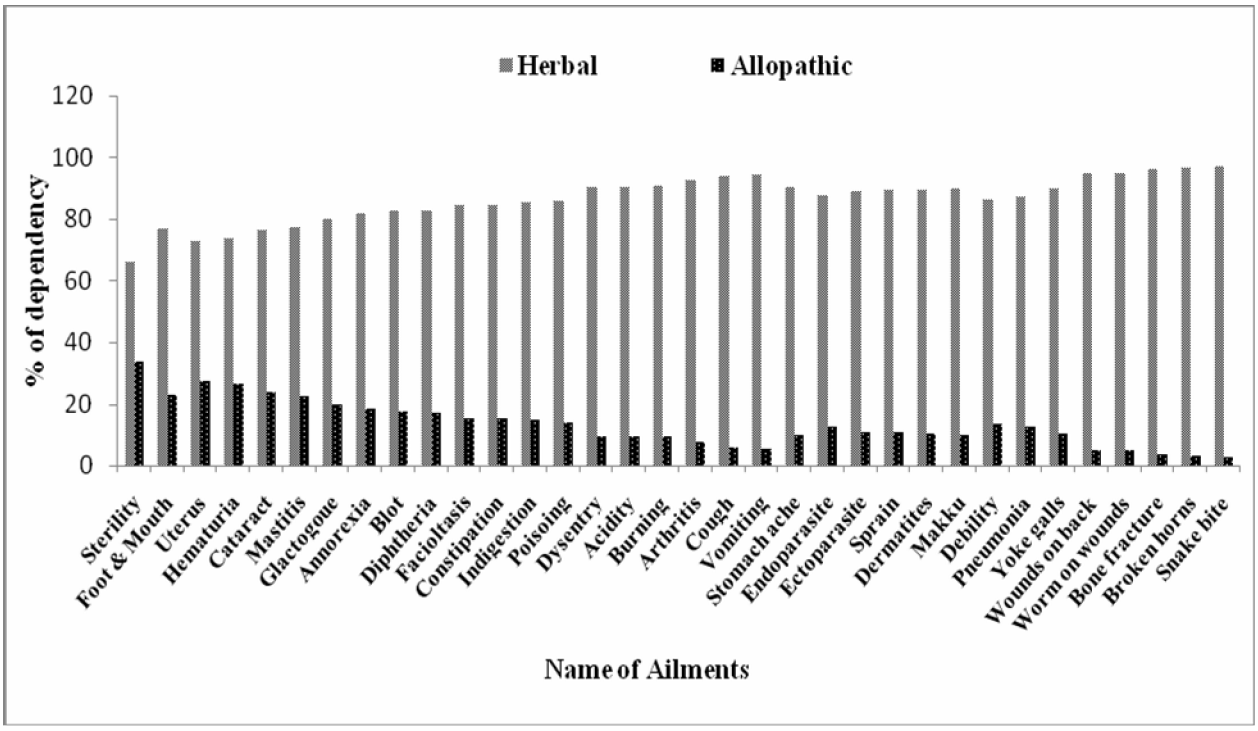

Figure 3: Dependency on herbal and allopathic system of treatments for curing veterinary ailments

that in the remote areas where majority of the old generation are illiterate and less educated, they possess good knowledge of traditional healing expertise for curing animal ailments (Table 2).

Out of the total population, more than 80% were found dependent on traditional system of treatments practiced by local healers, while rest of the people preferred allopathic system of treatments for curing animal ailments. It was also observed that people living in the remote/far flung areas (10-30 km. away from road head) depend almost totally on plant based treatments for curing animal ailments (Figure 2). It was observed that a variety of the diseases in livestock (i.e. snakebite, bone fracture, broken horns, worm on wounds, vomiting, cough and yoke galls etc.) are still totally managed through traditional system of treatment (Figure 3). However, for some of the diseases, people bring their livestock for allopathic treatment (i.e. sterility, foot and mouth disease, uterus disorder, cataract etc.).

With regard to prevention and modern management of animal diseases, majority of local people are not aware of it as only 41.60% local people vaccinate a few animals which are productive and more important to them (Meena et al., 2007). It was also found that among the local people, women, confidently use the local remedies for curing animal diseases. The traditional societies, though convinced of the efficacy of local medicines, have as their major constraints/limitations to its wider use as the effort involved in preparation of the medicine and availability of ingredients, since large number of medicinal plants have become quite rare and not easily available. Very limited studies have been carried so far on the traditional system of health care practiced by local communities in the livestock sector of the Himalaya in particular and India in general. However, few studies carried out during recent past focused on the identification of livestock diseases prevailing in the region as the major cause of the animal deaths. The study carried out by Meena et al. (2007) reported that during last five years, infectious, parasitic and respiratory diseases accounted for nearly 60 percent of all livestock deaths in Kumaon region of Uttarakhand state in India. In areas/regions that are either remotely located or isolated from the mainstream development, local people still use medicinal plants and also apply other traditional practices for curing livestock diseases and thus animal death reported from those areas was comparatively less (Chauhan et al., 1994; Jithendran and Bhat,1999).

It was found that besides traditional herbal healers, every elderly person both man and woman in the villages had sound knowledge and deep understanding about medicinal use of some plants, especially those species which are often used for curing common diseases like pneumonia, bloat, poisoning, cough, debility, bone fracture, wounds, cuts etc. The younger generation, though poor in knowledge of medicinal plants, still had faith in the efficacy of herbal system of treatments for curing animal ailments. Usually, people preferred to consult traditional herbal healers for curing livestock diseases although they knew some medicinal

Table 1: Indigenous uses of medicinal plants for curing veterinary ailments

S. No.	Name of ailments	Local name	Symptoms	affected animals	Plant species used (Vernacular name-Family)	Use pattern
1.	Blot	Afara	Gloating of stomach	Buffalo, Cow, Oxen, Sheep	*Trachyspermum ammi* (Ajawain-Umbelliferae)	Seeds of *Trachyspermum ammi* and rhizome of *Zingiber officinale*, *Ferula asafoetida* and fruit of *Piper nigrum* mixed and grinded with water and paste is used to cure blot.
					Lycopersicon esculentum (Tamater-Solanaceae)	Fruit is applied.
					Citrus medica (Nimbu-Rutaceae)	Fruit juice is applied.
2.	Mastitis	Thanela	Blocking of the milk hole udder	Buffalo, Cow, Goat	*Lyonia ovalifolia* (Anyar-Ericaceae)	Bark of *Lyonia ovalifolia* is grinded to powder and mixed with ash of *Quercus leucotricophora* and its smoke is used.
					Curcuma domestica (Haldi-Zingiberaceae)	Rhizome of *Curcuma domestica* is mixed with oil of *Brassica campestris* and rubbed to cure mastitis.
					Bombax ceiba (Semal-Bombaceae)	Bark of *Bombax ceiba* mixed with seeds of *Glycine max* and grind with water to eat.
3.	Poisoning	Vish	Saliva from the mouth	Buffalo, Cow, Oxen, Sheep, Goat	*Vigna mungo* (Kali dal-Fabaceae)	Seed powders *mixed with water and apply* to drink.
					Coriandrum sativum (Dhania-Umbelliferae)	Seeds powder mixed with water and applies to drink.
					Allium cepa (Pyaj-Liliaceae)	Bulb is grinded and mixed with black salt and used to drink with water
					Zingiber officinale (Adrak-Zingiberaceae)	Rhizomes of *Zingiber officinale* grind and mixed with black salt and apply to eat.
					Angelica glauca (Choru-Apiaceae)	Roots powder mixed with tea to drink.
					Piper nigrum (Kali mirch-Piperaceae)	Powders of *Piper nigrum* mixed with water and apply to drink.
					Sesamum orientale (Til-Pedaliaceae)	Seeds are grind with water and used to cure poisoning.
4.	Cough	Khansi	Frequent coughing	Buffalo, Cow, Oxen, Sheep, Goat, Horse, Mule, Dog	*Dendrocalamus strictus* (Banss-Poaceae)	Green leaves of *Dendrocalamus strictus* grind with seeds of *Hordeum vulgare* and used to eat.
					Oryza sativa (Dhan-Poaceae)	Seeds are boiled with water and juice (Mund) is applied.

5.	Fascioltasis	Chhipadi	Growth of hard knot on the surface of thyroid gland	Buffalo, Cow, Oxen	*Zanthoxylum armatum* (Timru-Rutaceae)	Bark of *Zanthoxylum armatum* milled with pod of *Capsicum annuum* and used to eat.
					Oryza sativa (Dhan-Poaceae)	Inflorescence is directly applied to eat.
6.	Anorexia	Bhook na lagna	Stops eating fodder	Buffalo, Cow, Oxen, Sheep, Goat, Horse, Mule, Dog	*Terminalia chebula* (Haira- Combretaceae)	Seeds of *Trachyspermum ammi* and bark of *Terminalia chebula*, Rhizome of *Cuminum cyminum*, seeds of *Raphanus sativus* grind and mixed with black salt and used to eat.
7.	Indigestion	Apach	Bleaches out chewed food	Buffalo, Cow, Oxen, Sheep, Goat, Horse, Mule, Dog, Cat	*Piper nigrum* (Kali mirch-Piperaceae)	Grind *Piper nigrum* and mixed with black salt with water and used to eat.
8.	Constipation	Kabj	Dung is extra solid	Buffalo, Cow, Oxen	*Bombax ceiba* (Semal-Bombaceae)	Milled the bark of *Bombax ceiba* with water and make a solution and used to eat.
					Cassia fistula (Amaltas- Caesalpiniaceae)	Pod of *Cassia fistula* directly used to eat.
9.	Foot and Mouth disease	Khuri	Infection of mouth and hoops	Buffalo, Cow, Oxen, Sheep, Goat	*Acacia catechu* (Supari-Mimosaceae)	Bark of *Acacia catechu* boiled with water for making a solution and used eat.
					Mangifera indica (Aam-Anacardiaceae)	Leaves directly used to eat
					Allium cepa (Pyaj-Liliaceae)	Bulb is grind and mixed with black salt and used to drink with water
					Picrorhiza kurrooa (Kutaki-Scrophulaceae)	Dried roots milled along with sugar and drink with water.
					Lyonia ovalifolia (Anyar-Ericaceae)	Buds of *Lyonia ovalifolia* milled with bark of *Juglans regia* and make a solution with mustard oil and paste is applied externally.
10.	Dermatitis	Damri	White patches and hair loss from the skin	Buffalo	*Stephania glabra* (Gindaru-Menispermaceae)	Grind of *Stephania glabra* and used to eat with water.
					Elucine coracana (Koda-Poaceae)	*Urgenia indica* grind with *Elucine coracana* and used to eat with water.
					Glycine max (Bhatt-Fabaceae)	Seeds of *Glycine max* is milled and used to eat with water
					Quercus leucotricophora (Banj-Fagaceae)	Ash is externally used.
11.	Cataract	Phula	White rashes on the surface of eye ball	Buffalo, Cow, Oxen, Sheep, Goat, Horse, Mule, Dog, Cat	*Berberis aristata* (Kinmor-Berbridaceae)	Root decoction (juice) and few drops applied to cure eye infection.
					Oxalis corniculata (Bhilmori-Oxalidaceae)	Leaves juice is used to cure eye infection.

12.	Hematuria	Khuni peisab	Bleeding with urine	Buffalo, Cow, Oxen	*Dalbergia sissoo* (Sisham-Fabaceae)	Green leaves directly used to eat.
					Lawsonia inermis (Mehandi-Lythraceae)	Green leaves directly used to eat.
13.	Arthritis	Jod dard	Swelling in the joints and hamstrung mussels	Buffalo, Cow, Oxen, Sheep, Horse, Mule	*Calotropis procera* (Aak- Asclepiadaceae)	Leaves of *Calotropis procera* and bulb of *Allium sativum* fried with mustard oil and rubbed on infected part.
14.	Pneumonia	Garmi bukhar	Increase body temperature and running nose	Buffalo, Cow, Oxen, Sheep, Goat, Dog	*Trigonella foenum* (Methi-Fabaceae)	Seeds of *Trachyspermum ammi*, Rhizome of *Curcuma domestica*, Leaves of *Trigonella foenum* and *Dendrocalamus strictus* grind and mixed with *Piper nigrum* and used to eat with water.
					Megacarpaea polyandra (Barmoa-Brassicaceae)	Root decoction of *Megacarpaea polyandra* mixed with sugar and drink to cure Pneumonia
15.	Burning	Jalna	Burns on the skin	Buffalo, Cow, Oxen, Sheep, Goat, Horse, Mule, Dog, Cat	*Triticum aestivum* (Gahu-Poaceae)	Seeds are grind and make a paste used externally.
16.	Sprain	Moch aana	Sprain on the foot	Buffalo, Cow, Oxen, Sheep, Goat, Horse, Mule, Dog, Cat	*Urtica parviflora* (Kandali-Urticaceae)	Fresh leaves are rubbed on the infected part.
					Pinus roxburghi (Cheer-Pinaceae)	Boiled the leaves of *Cannabis sativa* with ash of *Pinus roxburghi* and black salt and used externally.
17.	Dysentery	Peichis	Frequent loose motion	Buffalo, Cow, Oxen, Sheep, Goat, Dog	*Glycine max* (Bhatt-Fabaceae)	Seeds of *Glycine max* is milled and used to eat with water.
					Allium cepa (Pyaj-Liliaceae)	Bulb is grind and mixed with black salt and used to drink with water.
					Mentha arvensis (Podina-Lamiaceae)	Milled fresh leaves and mixed with black salt and used to eat with water.
					Raphanus sativa (Muli-Brassicaceae)	Grind the underground part and used to eat with water.
					Aconitum hetrophyllum (Atis- Ranunculaceae)	Root paste used to eat with water.
					Elucine coracana (Koda-Poaceae)	Seeds are grind and used to eat with water.
18.	Lice and Ticks	Joon padna	Itching on the skin	Buffalo, Sheep, Goat, Dog,	*Artemisia nilagirica*	Milled the leaves and juice is applied externally.

	Infection (Ectoparasite)			Cat	(Kunja-Asteraceae)	
					Acorus calamus (Buch-Araceae)	Apply corn powder externally through mixing coconut oil and used to externally.
					Sapindus mukorossi (Reetha-Sapindaceae)	Mature fruit is grind with water and paste is externally applied to cure lice and ticks infection.
					Zea mays (Makka-Poaceae)	Ash of cob mixed with *Brassica compestris* oil and externally used.
19.	Endo parasite	Peit main keera	Discharge of worms in the dung	Buffalo, Cow, Oxen	*Asculus indica* (Panger-Hippocastanaceae)	Mature fruit is milled with water and apply to drink.
20.	Sterility	Banjhpan	Obesity and eccentric behave	Buffalo, Cow, Goat, Sheep	*Hordeum vulgare* (Jau-Poaceae)	Seeds are milled of *Hordeum vulgare* and *Triticum aestivum* with *Trigonella foenum* and make a powder is used to eat with water.
					Urtica dioca (Kandali-Urticaceae)	Mature inflorescence is grind and used to eat
					Cicer areitinum (China-Fabaceae)	Germinated *Cicer areitinum* used to eat.
21.	Uterus disorder	Jair	Placenta membrane is held up inside the womb	Buffalo	*Myrica esculenta* (Kafal- Myricaceae)	Bark boiled with water and used externally.
					Picrorhiza kurrooa Kutaki-Scrophulaceae)	Dried roots milled along with sugar and drink with water.
22.	Bone fracture	Hadi tootna	Swelling on the fracture part	Buffalo, Cow, Oxen, Sheep, Goat, Horse, Mule, Dog, Cat	*Vanda testacea* (Laguli-Orchidaceae)	Grind the leaves to make a paste and apply on fractured part. The fractured part is supported by *Dendrocalamus strictus.*
					Agave americana (Ramban-Agavaceae)	Leaf fibers used to tie the fractured bone.
					Achyranthus aspera (Latjeera-Amaranthaceae)	A piece of fresh root is grounded and the paste applied to cure bone fracture.
					Betula utilis (Bhojpatra-Betulaceae)	Seeds milled of *Vigna mungo* and mixed with *Cynodon dactylon* and make a paste, used to plaster on fractured part then covered the bark of *Betula utilis/Zanthoxylum armatum*.
23.	Broken horns	Seeng tootna	Shelling off outer layer of horn concomitant bleeding	Buffalo, Cow, Oxen, Sheep, Goat	*Tagetus erectus* (Genda-Asteraceae)	Milled the fresh leaves and juice is applied externally.
					Rehum emodi (Dolu-Polygonaceae)	Root paste is externally applied.
					Pinus roxburghi	Resin is used to join the broken parts.

					(Cheer-Pinaceae)	
					Curcuma domestica (Haldi-Zingiberaceae)	Rhizome paste is applied externally.
					Cedrus deodara (Devdar-Pinaceae)	Bark oil is applied externally.
					Geranium wallichianum (Kaphlya-Geraniaceae)	Root paste is externally used to cure broken horns.
					Oryza sativa (Dhan-Poaceae)	Seeds grind and make a paste is used to join the broken parts.
24.	Snake bite	Sharp dans	Bleeding and swelling on the bitten part	Buffalo, Cow, Oxen, Sheep, Goat, Horse, Mule, Dog	*Allium sativum* (Lahsun-Liliaceae)	Milled the leaves of *Allium sativum* and *Azadirachta indiaca* and juice is applied to drink with water.
25.	Yoke galls	Kandha aana	Wounds and swelling on the neck	Oxen	*Curcuma domestica* (Haldi-Zingiberaceae)	Rhizome of *Curcuma domestica* dry over flame than grind and mixed with oil of *Brassica compestris* and externally used to the infected part.
26.	Diphtheria	Kand Rohni	Infection of the throat	Cow, Oxen	*Ficus religiosa* (Peepal-Moraceae)	Rhizome of *Zingiber officinale* and leaves of *Ficus religiosa* boiled with water and make a solution and used to eat.
27.	Abdominal pain	Peit Shool	Frequent lying and standing movements	Horse, Mule	*Cannabis sativa* (Bhang- Cannabaceae)	Resins obtain from the leaves of *Cannabis sativa* and leaves of *Nicotiana tabacum* mixed and burn over flame and smoke is used.
					Saccharum officinarum (Ganna-Poaceae)	Rhizome of *Curcuma domestica*, *Zingiber officinale* and bulb of *Allium sativum*, seeds of *Trachyspermum ammi* and *Brassica juncea* is milled and mixed with goor of *Saccharum officinarum* provided to animal to eat for curing abdominal pain.
28.	Debility	Kamjori	Feel more sleeping and motionless	Buffalo, Cow, Oxen, Sheep, Goat, Horse, Mule	*Triticum aestivum* (Gahu-Poaceae)	*Seeds of Triticum aestivum* boiled with water and used to eat for curing debility.
					Glycine max (Bhatt-Fabaceae)	Seeds of *Glycine max* and *Hordeum vulgare* boiled with water and used to eat.
					Tinospora cordifolia (Gelai-Menispermaceae)	Grind the root and used to eat with water to curing debility.
29.	Acidity	Gais	Foul smell	Oxen, Horse, Mule	*Angelica glauca* (Choru-Apiaceae)	Roots powder mixed with tea and used to drink to cure acidity.
30.	Vomiting	Ulti	Oozing waste material from the mouth	Dog, Cat	*Hordeum vulgare* (Jau-Poaceae)	Fresh green leaves are directly applied to cure vomiting.
31.	Skin disease	Makku	Itching and hair loss of the skin	Sheep, Goat	*Cedrus deodara* Devdar-Pinaceae)	Oil is obtained from the bark and rubbed.

32.	Glactogogue	Dudh na nikalna	Drying up of milk gland	Buffalo, Cow, Sheep, Goat	*Grevia optiva* (Bheemal-Tiliaceae)	Fresh green leaves are directly applied to cure glactogogue.
					Vigna mungo (Kali dal-Fabaceae)	Seeds of *Vigna mungo* is soaked with water for overnight then grind with water and used to cure glactogogue.
					Musa paradisiaca (Kela-Musaceae)	Mature fruit is applied.
33.	Wounds on back	Peeth per phodae hona	Wounds and boils on the back	Horse, Mule	*Brassica compestris* (Sarsoo-Brassicaceae)	Oil is used externally.
34.	worm on wounds	Ghaw per keere padna	Simmering worms inside the wounds	Buffalo, Cow, Oxen, Horse, Mule, Sheep, Goat	*Prunus persica* (Aaru-Rosaceae)	Leaf paste is externally used to cure germs on wounds.

Table 2: Perception of local people (n = 150) on the basis of socio-demographic characters and their response preference towards herbal treatments for curing veterinary ailments

S. No.	Characteristics		Responses (%)
1.	Gender	Male	46.7
		Female	53.3
2.	Education	Literate	43.4
		Illiterate	56.6
3.	Age	≤ 20	19.7
		21-50	33.1
		≥ 51	47.2
4.	Healing Experience	≤ 20	27.0
		21-50	34.6
		≥ 51	38.4

plants themselves. They perceived that the effectiveness of the herbs was connected to the knowledge of the exact nature of animal diseases. It was difficult to extract indigenous knowledge base, particularly related to medicinal plants from local communities. Even some traditional herbal healers those having little outside exposure do not pass information to their family members and others.

Conclusion

The traditional culture and indigenous knowledge of tribal and non-tribal communities in Alaknanda catchment has a series of challenges during recent past. Lack of scientific validation is the major reason for non-adoption of ethnoveterinary medicine by field veterinarians and trained main power. Experiences indicate that some of the practices are good while many of them are much effective. Scientific evolution, besides understanding the technology of the clientele helps ascertain the degree and direction of change through formal research and will be rewarding in adoption by the veterinarian. It must be born in mind that validation of ethnoveterinary practices will require flexibility, creativity and dedication in research application. There is an urgent need of a comprehensive analysis and documentation of indigenous knowledge of curing animal ailments in the Alaknanda catchment particularly in remote areas. The revitalization of these indigenous systems can provide self-reliance in primary health care and can even contribute to the frontiers of veterinary system of medicine. The present study conducted in remote areas showed that most technical persons are aware of traditional knowledge systems but they don't use them because these are not properly validated.

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