

Inventory of traditional ethno-veterinary practices followed by goat keepers in Uttarakhand

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A bench mark survey was conducted to collect the information on common diseases inflicting losses to the goats along with the use of local plants, plants parts and other traditional healthcare practices followed by the goat keepers of Uttarakhand. The results of the study revealed that diarrhoea, pneumonia, gastrointestinal helminthiasis, external parasites, retention of placenta and plant poisoning were very common problems and most of the goat keepers used the traditional medicines to treat these diseases/ ailments. Different plant species and their parts, viz. roots, leaves, bark powder, seeds and oils are used for treatment of these ailments.

Keywords: Diseases, Goat, Healthcare practices, Ethno-veterinary, Treatment

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Goats play an important role in the livelihood of small and landless farmers of the country. It is not only an additional source of income but also provides nutritional security to the poor people. However, the goat rearers face number of problems and losses mainly due to occurrence of diseases in the flock and mortality in animals. Uttarakhand state has many varying agro-climatic regions, and thus possesses many different goat breeds and types. The goat keepers in the state are still poor but they have built up a large network of traditional knowledge of goat healthcare and management^{1,2}. They use a wide variety of indigenous plants, minerals and locally available products to cure their goats under the geo-agro climatic conditions. Traditional knowledge is a record of human accomplishment in apprehending the complexities of life and survival in often adverse environments. Traditional knowledge may be cultural, social and technical awareness or was obtained as part of great human experiments of continuity and advancement. The practices and remedies that are used by the people are based on knowledge gained through the experiences and agog observations of the

previous generations and is considered as ethno-veterinary approach which reduces the morbidity and mortality of livestock and increases their production potential³. Keeping in view the above, a study was conducted to estimate the extent of traditional ethno-veterinary practices followed by goat keepers in Uttarakhand.

Methodology

The area of study is characterized with a humid sub-tropical climate. The winters are severe and summers are hot and humid with an average rainfall of more than 1200 mm. The maximum temperature may go up to 44 °C in summer and minimum up to 0 °C in winter with relative humidity ranging between 15 to 95 %. The region has a number of large rivers and rivulets. A variety of green herbage is plentifully available in the area for grazing. A bench mark survey was conducted to collect the base line information from the goat rearers regarding to common diseases occurring in the goats and traditional goat healthcare practices used in healing these diseases in Udham Singh Nagar and Nainital districts of the Uttarakhand during a period of two year (April, 2015 to March, 2017). Multistage sampling method was adopted for

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the selection of respondents. Four clusters, viz. Bhimtal, Tilpuri, Bara and Kunda (Fig. 1) were selected from two districts (Udham Singh Nagar and Nainital). Total one hundred thirteen villages were surveyed. A list of goat rearing families of the selected villages was prepared with the help of village *Pradhan* and *Patvari* and mostly all goat rearers were selected for survey from each village. Thus, 645 selected respondents were interviewed, out of which the desired information related to traditional ethno-veterinary practices was collected from 138 goat keepers. The data were collected by using participatory rural appraisal and through the interview techniques through an interview schedule by administering a developed questionnaire on major diseases, prevalent traditional healthcare practices for controlling the diseases (by uses of plants and other raw materials) and mode of application. Live specimens of some medicinal plants that are used in the healing of goats were collected and identified.

Results

The most common ailments of goats in the study area and their local management are enumerated below:

Anoestrous problem: Anoestrus is one of the most commonly occurring reproductive problems in dairy animals in India which affecting livestock productivity and economics to great extent. Impairment in the normal reproductive function results in to infertility and sterility leading to economic losses due to widening of dry period, reduced calving and lactations during the life span of the animal. Anoestrus is absence of overt sign of estrus manifested either due to lack of expression of

estrus or failure of its detection. It may be physiological, pathological and nutritional. Many plants are rich source of vitamins and minerals whereas some have estrogenic property which is useful in restoration of cyclicity in anoestrous animals. Goat keepers of the study area reported some traditional herbs/ practices for solve anoestrous problem. Supplementation of *Cicer arietinum* L. (Bengal gram) soaked in water and given to goats at the rate of 100-150 g/ day for 3-5 days continuous to induce heat. Leaves of *Ficus benghalensis* L. (Banyan tree), *Ficus religiosa* L. (*Pipal*), *Mangifera indica* L. (Mango) and *Azadirachta indica* A. Juss. (Neem) mixed with each other and fed to goats early in morning for 5-7 days to solve anoestrous problem. Sprouted *Triticum aestivum* L. (Wheat) 200 g fed to the female animals for 5-6 days continuous to induce heat. Bolus made from pigeon droppings and Jaggery is given to animal once a day for 5-6 days for solve anoestrous problem. Some farmers reported that the excreta of breeding buck spread in the goat shed for 3-5 day continuous. This technique is very effective for induce heat in female goats.

Retention of placenta: Retention of placenta is the major post parturient problems in livestock. The condition occurs when the normal process of dehiscence and expulsion fail to take place. Normally fetal membrane arc expelled within 3-8 h post calving owing to hormonal and mechanical factors during the third stage of labour, however, if animals ail to do so up to 12 h, then they are considered as retained. Retention of fetal membranes denotes the failure of fetal villi to separate from the maternal crypts due to placental dehiscence, and the etiological factors, deficiency of vitamins (A, D) and minerals (Ca, P,

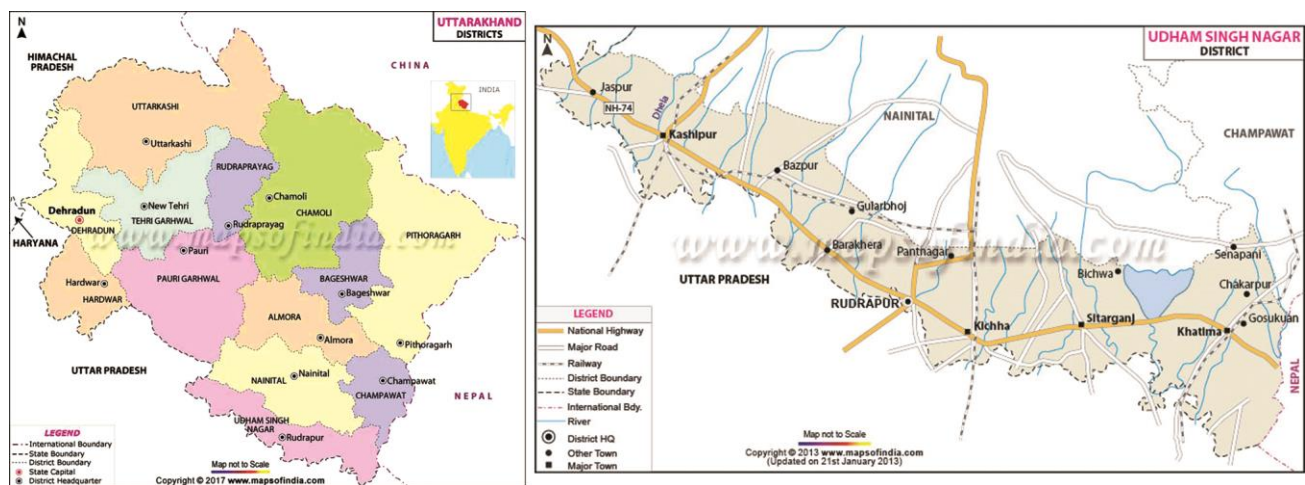


Fig. 1 — Map of study area

Se), are considered as the predisposing factors for Retention of placenta³. Most of the goat keepers in the study area are used a decoction prepared from dry *Zingiber officinale* Roscoe (Ginger) powder 40-50 g, *Trachyspermum ammi* (L.) Sprague (*Ajowan*) 40-50 g, green leaves of *Bambusa vulgaris* Schrad. (Bamboo) 40-50 g and molasses 200 g, and drench this decoction thrice a day to overcome the problem of retention of placenta. Some goat keeper reported that the leaves of *Oryza sativa* L. (Paddy) and *Saccharum officinarum* L. (Sugarcane) fed to goat (with lukewarm water) with jaggery. *Sesamum indicum* L. (Sesame) powder 50 g is orally administered with jaggery, effective for retention of placenta in goat. Buds of *Calendula officinalis* L. (Marigold) are fed to goats just after parturition for treating retention of placenta. It is very effective herb for expulsion of placenta which is expelled within 4-5 h. Decoction prepared from outer bark of *Syzygium jambos* (L.) Alston (*Jamun*) is given to goats thrice a day to remove placenta after kidding.

Mastitis: Mastitis is the inflammation of the mammary gland, mainly caused by biological agents such as different species of bacteria, fungus, virus, yeast, etc. and characterized by physical and chemical change in milk (discoloration, presence of clots and large number of leucocytes) and pathological changes in glandular tissue. Farmers reported that they prepared paste from the whole plant of *Eclipta prostrata* (L.) L. (*Bhringraj*) is applied on mastitis infected part for 3-4 day continuous to overcome the problem of mastitis.

Bloat/tympanites: A mixture prepared by *Ferula assa-foetida* (Heeng) 2-3 g, *Swertia chirata* Buch.-Ham. ex Wall. (*Chirayata*) 10 g, *Trachyspermum ammi* (L.) Sprague (*Ajowan*) 10-15 g, and black salt 10-15 g mixed with lukewarm water is given to goat to cure tympanites. Drenching of *Linum usitatissimum* L. (Linseed) oil 100 ml, dry powder of *Zingiber officinale* Roscoe (Ginger) 5 g and *Ferula assa-foetida* (Heeng) 2.5 g mixture is given for tympanis. Whole plant of *Melilotus alba* Ledeb. (*Van methi*) given three times in a day for providing relief to animal affected with stomach problem. Bark of *Syzygium jambos* (L.) Alston (*Jamun*) is ground and mixed with water, given orally to the animals to cure flatulence. Common salt 40-50 g and *Trachyspermum ammi* (L.) Sprague (*Ajowan*) 10 g mixed together are given orally to treat the goat that affected from bloat problem.

Fever and cold/Pneumonia: Paste is prepared from *Curcuma domestica* L. *syn Curcuma longa* L.

(Turmeric) 10 g, *Trachyspermum ammi* (L.) Sprague (*Ajowan*) 10 g and black salt 10-15 g and given to affected goat twice a day for 2-3 days. Decoction of *Ocimum sanctum* L. (*Tulsi*) leaves drenched twice a day for 2-3 days to cure fever. Decoction of *Swertia chirata* Buch.-Ham. ex Wall. (*Chirayita*) leaves and *Piper longum* L. (Pepper) drenched twice a day to goat to cure fever. Powder of *Trigonella foenum-graecum* L. (*Methi*) 40-50 g, *Zingiber officinale* Roscoe (Ginger) 5-7 g and *Trachyspermum ammi* (L.) Sprague (*Ajowan*) 10 g mixed with jaggery and given to goats for 2-3 days to overcome the problem of cold/Pneumonia. *Curcuma domestica* L. *syn Curcuma longa* L. (Turmeric) powder 10 g mixed with jaggery is fed to goats for 3 days. Powder of *Saussurea costus* (Falc.) Lipsch. (*Kutki*) root 10 g and *Triticum aestivum* L. (wheat) flour mixed, add some water to make a bolus, it is given to pneumonia affected animals at evening time for seven consecutive days.

Internal parasite: The juice derived from leaves and bark of *Melia azedarach* L. (*Bakain*) is drenched to goats (20 mL for 3-4 days) which work as anthelmintic. Powder of *Leucaena leucocephala* (Lam.) de Wit (*Subabul*) seed 50-60 g mixed with water is given to goats for 3-4 days. Decoction of Leaves, flower and bark of *Azadirachta indica* A.Juss. (Neem) is given to goats in morning time for three consecutive days. Dry leaves of *Ficus glomerata* Roxb. (*Gular*) and *Ficus benghalensis* L. (Banyan tree) are fed to goats in the morning at the rate of 200- 250 g per day for 5-7 day.

External parasites: *Ocimum sanctum* L. (*Tulsi*) leaf juice is smeared over the body. Powder of naphthalene balls are applied on the body and washed with water. Fumigation of *Nicotiana tabacum* L. leaves on ticks and lice. Leaves of *Nicotiana tabacum* L. (Tobacco) 40-50 g soaked in 1 L of water in evening time and next morning this water is mixed with mustard oil and a very small quantity of salt is also added and then it is applied on the skin to get rid of external parasites. Oil of *Brassica nigra* (L.) K.Koch (Mustard) and a very small quantity of salt is also added and then it is applies on the skin of the animals to kill ticks and lice.

Diarrhea: *Punica granatum* L. (Pomegranate) leaves 250 g are ground with in 1 L of water and drenched to the diarrhea affected goat twice a day, continued for 3 days. *Camellia sinensis* (L.) Kuntze leaves are boiled in water and given to goat twice a day, continued for 2- 3 days, which is helpful to

overcome diarrhea problem in goats. Powders of internal bark of *Syzygium jambos* (L.) Alston / *Mangifera indica* L. / *Grewia asiatica* L. are fed to goat at the rate of two tea spoons per day for 2 days it is very effective against diarrhea. These barks have carminative and anthelmintic properties. Paste is prepared from *Musa* × *paradisiaca* L. flowers and *Curcuma domestica* L. syn *Curcuma longa* L. (Turmeric) powder 10-15 g and given to goat twice a day for the treatment of diarrhoea. The astringent activity of *Musa* × *paradisiaca* L. flowers and antiseptic action of and *Curcuma domestica* L. help to control diarrhoea.

Dysentery: The green leaves of *Citrus limon* (L.) Osbeck are fed 5-7 consecutive days during winters to treat goats for dysentery. Cooked *Oryza sativa* L. water (starch) drenched to affected goat at the rate of 200 mL for 3-5 days continues to treat dysentery.

Constipation: *Ricinus communis* L. seeds 50- 60 g are ground and mixed with water and drenched to goat to treat constipation. Jaggery dissolved in water and given to affected animals thrice a day. Leaves powder of *Annona squamosa* L. (custard apple) mixed with *Brassica nigra* (L.) K.Koch oil are given orally to affected goats.

Open wound/ Injury: The leaves of *Azadirachta indica* A. Juss. are boiled in water, after cooling the green water is used to wash the infected wounds. Paste is prepared from leaves of *Azadirachta indica* A.Juss. after roasting on a pan, ground and mixed with *Brassica nigra* (L.) K.Koch oil, then applied on wound. A paste prepared from *Syzygium jambos* (L.) Alston leaves is applied on the wounds. *Cendrus deodara* (Roxb.) G. Don oil is used for foul ulcers and wounds. Paste of *Curcuma domestica* L. syn *Curcuma longa* L. mixed with oil of *Brassica nigra* (L.) K.Koch and applied on the wound. *Acacia katechu* (*Katha*) powder sprinkled on injured horn to check bleeding.

Burning cases: Paste prepared from leaves of *Lawsonia inermis* L. and applied on burnt area, twice daily.

Urinary disorders / Haematuria: Juice obtained from leaves of *Calendula officinalis* L. (Marigold) 100- 150 g is drenched to animals twice a day to treat urinary disorders. Leaves of *Cichorium intybus* L. crushed with water are given to affected goat orally at early in the morning for 5-7 days.

Indigestion: Leaves and inflorescence of *Cannabis indica* Lam. (*Bhang*) are crushed and given to the animal for two days. A paste prepared from powder of *Trigonella foenum-graecum* L. (*Methi*) seeds, *Allium sativum* L.

clove, leaves of *Azadirachta indica* A. Juss., black salt and jaggery is fed to affected goats twice a day for 3-4 days to overcome the problem of indigestion. *Ferula Assa-foetida* (*Heeng*) 2.5 g, black salt 50 g, *Trachyspermum ammi* (L.) Sprague 50 g is given to goat.

Plant poisoning: In case of plant poisoning most of goat keepers of the study area reported that roasted *Triticum aestivum* L. flour 100-150 g mixed with lukewarm water is given to goat twice a day. Baking soda (Sodium bicarbonate) 10-20 g mixed in water is given affected goats. Lime juice mixed with castor oil is drenched to affected goats against plant poisoning. Some farmer reported that *Lassi* (Buttermilk) and leaf paste of *Coriandrum sativum* L. (*Dhania*) is given to the animals thrice a day.

Snakebite: In case of snakebite, goat keepers of the region reported that they prepared paste from root of *Parnassia nubicola* Wall. ex Royle (*Futkiya*) and given orally to affected animals and also applied on wound of snakebite thrice a day for 3-4 days.

Foot and Mouth Disease: *Azadirachta indica* A. Juss. leaves were boiled in water, after cooling the green water is used to wash the infected hooves for 3-4 days. Extract of *Cuscuta epithimum* (L.) L. applied on lesions of foot and mouth disease for 3-5 days to enhance healing process and prevent secondary infection. Potassium permanganate mixed in water used to wash oral cavity twice or thrice a day. Leaf extract of *Pongamia pinnata* Pierre (*Karani*) applied over the hooves of animal infected with FMD continued for 3- 4 days.

Bone fracture: *Bambusa vulgaris* Schrad. (Bamboo) sticks are tied around the fractured bone. Warm *Calotropis gigantea* (L.) Dryand. (*Aak*) leaves and lime tied at affected part.

General weakness / to enhance growth: Leaves of *Leucaena leucocephala* (Lam.) de Wit (*Subabul*), *Azadirachta indica* A.Juss. (Neem), *Ficus religiosa* L. (*Pipal*), *Ficus benghalensis* L. (Banyan tree), *Ficus glomerata* Roxb. (*Gular*), etc., mainly used for supplementary feeding to growing goat for higher growth and body weight. Supplementation feeding of *Gossypium herbaceum* L. (Cotton seeds) in winter season for fast body growth especially to male goats that are reared for meat purpose.

Discussion

Some of the medicinal plants which have been used in the ethno-veterinary practices by goat keepers in Uttarakhand are presented in Table 1. The results of

Table 1 — Some of the medicinal plants which have been used in the ethno-veterinary practices by goat keepers in Uttarakhand

Plant's name	Botanical name	Parts used	Name of the diseases
Bengal gram	<i>Cicer arietinum</i> L.	Seeds	Anestrous problem
Wheat	<i>Triticum aestivum</i> L.	Seeds	Anestrous problem, pneumonia, plant poisoning
Banyan tree	<i>Ficus benghalensis</i> L.	Leaves	Anestrous problem, internal parasite, general weakness
Gular	<i>Ficus glomerata</i> Roxb.	Leaves	Internal parasite, general weakness
Pipal	<i>Ficus religiosa</i> L.	Leaves	Anestrous problem, general weakness
Mango	<i>Mangifera indica</i> L.	Leaves/ bark	Anestrous problem, diarrhea
Neem	<i>Azadirachta indica</i> A.Juss.	Leaves	Anestrous problem, internal parasite, wound, indigestion, FMD, general weakness
Ginger	<i>Zingiber officinale</i> Roscoe	Rhizomes	Retention of placenta, tympanites, pneumonia
Ajowan	<i>Trachyspermum ammi</i> (L.) Sprague	Seeds	Retention of placenta, tympanites, bloat problem, fever, cold/ pneumonia, indigestion
Bamboo	<i>Bambusa vulgaris</i> Schrad.	Leaves/ stem	Retention of placenta, bone fracture
Paddy	<i>Oryza sativa</i> L.	Leaves/ seeds	Retention of placenta, Dysentery
Sugarcane	<i>Saccharum officinarum</i> L.	leaves	Retention of placenta
Sesame	<i>Sesamum indicum</i> L.	Seeds	Retention of placenta
Marigold	<i>Calendula officinalis</i> L.	Buds	Retention of placenta, urinary disorders
Jamun	<i>Syzygium jambos</i> (L.) Alston	bark	Retention of placenta, flatulence, diarrhea, wound
Bhringraj	<i>Eclipta prostrata</i> (L.) L.	whole plant	Mastitis
Chirayata	<i>Swertia chirata</i> Buch.-Ham. ex Wall.	Leaves	Tympanites, fever / pneumonia
Linseed	<i>Linum usitatissimum</i> L.	Seeds	tympanites
Van methi	<i>Melilotus alba</i> Ledeb.	Whole plant	Fever / pneumonia
Methi	<i>Trigonella foenum-graecum</i> L.	Seeds	Pneumonia, indigestion
Turmeric	<i>C. domestica</i> L. syn <i>C. longa</i> L.	Rhizomes	Fever / pneumonia, diarrhoea, wound
Pepper	<i>Piper longum</i> L.	Seeds	Fever
Kutki	<i>Saussurea costus</i> (Falc.) Lipsch.	Root	pneumonia
Bakain	<i>Melia azedarach</i> L.	bark	Internal parasite
Subabul	<i>L. leucocephala</i> (Lam.) de Wit	Seed	Internal parasite, general weakness
Tulsi	<i>Ocimum sanctum</i> L.	Leaves	External parasites
Tobacco	<i>Nicotiana tabacum</i> L.	Leaves	External parasites
Mustard	<i>Brassica nigra</i> (L.) K.Koch	Oil	External parasites, constipation, wound
Pomegranate	<i>Punica granatum</i> L.	Leaves	Diarrhea
Tea	<i>Camellia sinensis</i> (L.) Kuntze	Leaves	Diarrhea
Falsa	<i>Grewia asiatica</i> L.	Bark	Diarrhea
Banana	<i>Musa × paradisiaca</i> L.	Flowers	Diarrhoea
lemon	<i>Citrus limon</i> (L.) Osbeck	Leaves	Dysentery
Custard apple	<i>Annona squamosa</i> L.	Leaves	Constipation
Henna	<i>Lawsonia inermis</i> L.	Leaves	Burning cases
Cichorium	<i>Cichorium intybus</i> L.	Leaves	Urinary disorders
Bhang	<i>Cannabis indica</i> Lam.	Leaves inflorescence	Indigestion
Onion	<i>Allium sativum</i> L.	clove	Indigestion
Dhania	<i>Coriandrum sativum</i> L.	Leaves	Plant poisoning
Futkiya	<i>Parnassia nubicola</i> Wall. ex Royle	Roots	Snakebite
Karanj	<i>Pongamia pinnata</i> (L.) Pierre	Leaves	FMD
Aak	<i>Calotropis gigantea</i> (L.) Dryand.	Leaves	Bone fracture
Cotton	<i>Gossypium herbaceum</i> L.	Seeds	General weakness

the present study revealed that in general, anestrus problem, retention of placenta, bloat/ tympanites, dysentery, diarrhoea, fever, pneumonia, gastrointestinal helminthiasis, external parasites, constipation, wounds, burning, urinary disorders, indigestion problem, plant poisonings, snakebite, foot and mouth disease, bone fracture, general weakness and mastitis were eighteen common conditions/ ailments of goats for which traditional ethno-veterinary practices are usually being used in the area. According to the goat keepers, diarrhoea, pneumonia, gastrointestinal helminthiasis, external parasites, retention of placenta and plant poisonings are very common problems in study area and they used traditional medicines to treat these diseases. Different types of plant species and their parts are used for the treatment of these ailments. The plants and other ingredients which are commonly used for healing of the goats by the goat rearers in the study are *Cicer arietinum* L. (the presence of carbohydrates, proteins, amino acids, fixed oils, phytosterols, alkaloids, phenolic compounds and tannins, aphrodisiac, estrogenic, antioxidant, antidiabetic, anti-inflammatory, hypocholesterolaemic, antidiarrhoeal anticonvulsant, hepatoprotective, diuretic properties), *Triticum aestivum* L. (immune-modulator, antioxidant, astringent, laxative, diuretic, antibacterial) *Curcuma domestica* L. syn *Curcuma longa* L. (possesses caffeic acid, curcumin, limonene, eugenol and turmerin, etc.; all these compounds are antimutagenic, antiseptic and anti-influenza in property) *Ficus benghalensis* L. (anti-inflammatory, antioxidant, antihistaminic, anti-diarrheal, antimicrobial, antifungal and antibacterial), *Ficus religiosa* L. (anti-dysentetic, antiseptic, antigastroduodenal, antibacterial, laxative, anti-inflammatory, antioxidant), *Magnifera indica* L. (macolytic, antibronchitic, laxative, antibacterial and hypotensive properties) and *Azadirachta indica* A. Juss. (immunomodulatory, anti-inflammatory, antioxidant, antiseptic, antimutagenic and anticarcinogenic properties), *Melia azedarach* L. (antidiarrhoeal, deobstruent, antiseptic, anthelmintic, constipating, expectorant, febrifuge and antiperiodic), *Tagetes erecta* L. (antigastroduodenal, antibacterial, laxative, anti-inflammatory, antioxidant), *Syzygium cumini* L. (carminative, anti-scorbutic and diuretic and have ployphenolic compounds), *Ocimum tenuiflorum* L. (antioxidant, antibacterial, antimicrobial, antifungal, hypolipidemic, antipyretic and anti-inflammatory), *Musa × paradisiaca* L. (rich source of vitamins and minerals, anti-ageing power and has high amount of 5 hydroxytryptamine, which is inhibits gastric secretion

and stimulates smooth muscle in the intestine and elsewhere), *Cannabis indica* Lam. (antioxidant, cure dysentery, quicken digestion, rich in minerals, an appetizer), *Cichorium intybus* L. (anti-inflammatory, antioxidant, antibacterial, antiviral, countering anxiety, diuretic, antitumor agents), *Saccharum officinarum* L. (rich in carbohydrate and iron, diuretic, used as disinfectant of urinary tract), *Syzygium aromaticum* L. (anti-carcinogenic, antioxidant, anti-mutagenic, anti-inflammatory antibacterial), *Trigonella foenum-graecum* L. (immunomodulatory, antioxidant, anti-inflammatory and antipyretic), *Trachyspermum ammi* (L.) Sprague (carminative, laxative, stomachic and anthelmintic), *Saussurea costus* (Falc.) Lipsch. (immunomodulatory, antioxidant, anti-inflammatory and antipyretic), *Zingiber officinale* Roscoe (antioxidant, anti-inflammatory and antipyretic), *Ferula assa-foetida* L. (antifungal, anti-diabetic, anti-mutagenic, antiviral, anti-inflammatory), Jaggery (rich source of vitamins, minerals, acts as diuretic, digestive stimulant properties and increases the water intake capacity) and black salt (used as digestive aid, relieving intestinal gas and heartburn, laxative, consists of many essential minerals)^{1,2,4,5,8}. Mostly freshly collected medicinal plants are used in the juice form which is extracted from different parts of plant, followed by paste used for treatment. Plant roots, leaves, bark powder, seeds, oils, *heeng*, black salt and jaggery are also used for treatment. Traditional goat healing prescriptions were commonly prepared by grinding, crushing, preparing decoction in water or any vegetable oil and mixing the ingredients as such. The commonly used methods of administration were feeding, drenching and tropical application. The farmers reported different types of indigenous practices for healing the animals for the same ailment. It was clearly seen in the study that a majority of the traditional goat healthcare practices have largely remained undocumented thus far. On the other hand, some of the well known plants and their parts that are used for treatment in many diseases in this area were also reported for similar use in different part of the country^{1,2,4-11}. It represents an immensely valuable database which provides the baseline information for the commercial exploitation of bio-resources and also the information could be useful for botanists, pharmacologists, pharmaceuticals industry and alike interested in developing new livestock healing practices and methods that is befitting to the local environment in future. However, the scientific management of goats and

combination of modern and local remedies are the best solution for goat health problems in rural areas.

Conclusion

Traditional ethno-veterinary practices have played a significant role in the conservation of unique biodiversity and are considered to be better in economic terms with the added advantages of healing the ailments without any side effects. Therefore, indigenous knowledge of ethno-veterinary practices may be beneficial for the entire animal kingdom if validated scientifically.

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