

Ethnoveterinary Medicinal plants of Tosham block of district Bhiwani (Haryana) India

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ABSTRACT

Livestock is an important sector of agriculture in Haryana. It brings cash income to the rural families, bringing protection against the social depressions in addition to providing the food products of high nutritional value. In present study we have discussed ethnoveterinary uses, mode of administration, doses and duration of 54 medicinal plant species belonging to 37 families for treating routine maladies of livestock. About 80% interviewed people gained their knowledge of traditional medicine from their parents and grandparents and others gained from neighbours and co-producers. It has been observed that older persons and traditional healers have greater knowledge about traditional medicines than younger persons. In the present study it was found that many plants viz. *Acacia nilotica*, *Argemone mexicana*, *Azadirachta indica*, *Calotropis procera*, *Citrullus colocynthis*, *Trachyspermum ammi*, *Zizyphus nummularia* etc. are used for treating more than one disease. It has also been observed that freshly collected plants or plants parts are used in treatment. Though, the findings presented in this paper are preliminary and needs further authentication but these findings can aid the development of indigenous knowledge and its use to the benefits of various fields of study such as pharmacology, pharmacognosy, pharmaceuticals, toxicology, phytochemistry, ethnobotany, taxonomy, anthropology and veterinary science.

INTRODUCTION

Nature has been the source of therapeutic agents for treating human and livestock diseases since the dawn of civilization. Medicinal plants have a long history of use in the treatment of both human and animal diseases. A large number of modern drugs have been isolated from natural sources particularly from the plant world. The plant based traditional medicine systems continue to play an essential role in health care, with about 80% of the world's farmers, shepherds and animal growers relying mainly on traditional medicines for treating routine maladies for their livestock (Lulekal *et al.*, 2008 and Devi *et al.*, 2009). The science that specifically deals with treating their livestock and other domestic animals with traditional medicine is known as 'ethnoveterinary medicine'. In the field of veterinary medicine, attention has turned from orthodox to ethnoveterinary medicine for two reasons: first, as the gulf widens between the poor and developed countries, the former can no longer afford the drugs produced by the latter and, secondly, the quality of some of the

drugs available in developing countries is questionable (Mallik *et al.*, 2012). It is now realized that this kind of complementary medical approach is crucial and necessary to boost livestock production at community level (Toyang *et al.*, 1995; Monteiro *et al.*, 1998). Formal research in ethnoveterinary medicine will no doubt help to confirm the claims made by ethnoveterinarians with respect to the efficacy of ethnoveterinary treatments by ethnoveterinarians. So, there is need to standardize ethnoveterinary medicines to fully integrate it into orthodox medicine. Many countries have documented ethnoveterinary practices with special emphasis on use of medicinal plants and some countries have already developed databases on botanical resources and using them in their research studies and development. A large number of rural people use local herbal medicines for treatment of their domestic animals and the role of ethnoveterinary medicine in livestock development is beyond dispute (Tiwari and Pande, 2009; Mallik *et al.*, 2012; Adedeji *et al.*, 2013; Galav *et al.*, 2013). Haryana being an agricultural state with predominance of rural population and hence animals, particularly cattle, play great role in economy and social welfare. Pastoralists and farmers of Haryana have to treat their animals with traditional medicines in spite of the availability of a large number of veterinary dispensaries and veterinary hospitals,

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primarily because of high cost of allopathic medicines and their associated side effects, cultural preferences and unavailability of required medicines in veterinary dispensaries and hospitals. Though, some ethnobotanical studies have been conducted in Haryana (Jain and Verma, 1987; Sharma and Ahmad, 1995; Yadav *et al.*, 2004; Yadav and Bhandoria, 2013) but little information is available regarding ethnoveterinary medicine for Haryana in general and Tosham block in particular. In view of this, the present study was conducted in Tosham block of Bhiwani district to identify, collect and document the ethnoveterinary medicinal plants used by people of this area and their utilization for primary health care of animals in treatments of different ailments.

MATERIALS AND METHODS

Description of the study site

Tosham block is an administrative unit of 108 villages lies in Bhiwani district of Haryana state (Figure 1). Total geographical area of this block is 745 Km². The topography of the Tosham block includes the offshoots of Aravali slope and sand dunes of different sizes. The hills have been denuded since ages and hence are left with a height ranging from 300 to 425 m above mean sea level. The hills are mostly steep, bare, rocky and general slope of terrain is from south to north. The climatic condition of the Tosham block varies from arid to semi arid. Basic pattern of the climate is determined by monsoonal rhythms and it is sub tropical, continental and monsoonal. June is the period of highest incidence of dust storm. The climate of this region, except during the monsoon, is characterized by dryness of air, a hot summer and a cold winter. The average temperature ranges from 3° to 45°C. The daily and seasonal ranges of temperature are high. Hot scorching, dust laden winds blow from the Thar Desert of Rajasthan in June and July. The normal annual rainfall of block is 420 mm.

Tropical thorn scrubs and succulent type of vegetation is prevalent in the region. A number of ephemeral plants are found which complete their life cycle in rainy season. Some of these plants are used by local people as ingredients in pharmaceutical formulations to treat routine maladies. A few of them are also used as vegetables. Wheat, cotton, bajra, mustard, barley, gram and guar are the major crops grown in this region. Grazers and browsers like goat, sheep, camels, cows and buffaloes are also in abundance. The blue bull or Nilgai is common all over the region. The people of this area are basically farmers and most of them are having domestic animals such as buffalo, camel, cow, goat, sheep and dog.

Data collection

An extensive field survey was undertaken from January 2012 to June 2013 in different villages of Tosham block to explore the ethnoveterinary potential. During the survey interviews were conducted in the local language. The data were collected from local experienced people including elders, shepherds, veterinary practitioners, vaidyas and hakims. Some of the field sites were visited accompanying with local vaidyas/hakims. First hand

information was noted in field notebook. The data were considered worth mentioning only when more than five informants gave similar information for the same plant. The information was further verified by cross checking with other knowledgeable persons of other villages of the study area.

Plant specimens collected from the study sites were identified in the field itself while unidentified plants were identified with the help of available literature (Maheshwari, 1963; Jain *et al.*, 2000).

RESULTS

In the present study ethnoveterinary uses of 54 medicinal plant species are documented. The routine maladies of livestock *viz.* diarrhoea, injury, fever, digestive disorders and maternity complications etc. are treated with these medicinal plants. Detailed information pertaining to these medicinal plants used in ethnoveterinary medicine *viz.* their botanical name, vernacular names, name of the family, part used, mode of preparation, administration, doses and duration for each plant is given below:

(1) Botanical Name: ***Acacia nilotica* (L.) Delile**
 Vernacular Name: Kikar
 Family: Mimosaceae
 Habit: Tree
 Part used: Leaves

Ethnoveterinary uses: (i) 500g tender twigs are given as feedstuff for 2-3 days to buffaloes for curing diarrhoea.

(ii) 500g fruits are given as feedstuff daily for 4-5 days to the sheep and goats to kill the stomach worms.

(iii) 50g dried leaves powder is mixed with 200g cow butter and 100g sugar (khand) and is given weekly for facilitating smooth delivery in cattle.

(2) Botanical Name: ***Aegle marmelos* (L.) Correa**
 Vernacular Name: Bel pathar
 Family: Rutaceae
 Habit: Tree
 Part used: Fruit

Ethnoveterinary uses: Paste of 500g fruit mixed with 50g dried ginger fed orally once a day, 2-3 days to treat dysentery and diarrhoea.

(3) Botanical Name: ***Albizia lebbek* (L.) Benth.**
 Vernacular Name: Siras
 Family: Mimosaceae
 Habit: Tree
 Part used: Leaves

Ethnoveterinary uses: Juice of the crushed green leaves is dropped to the eyes to treat general eye problem in goat, cow and buffalo.

(4) Botanical Name: ***Allium sativum* L.**
 Vernacular Name: Lahsun
 Family: Liliaceae

Habit: Herb
 Part used: Fruit
Ethnoveterinary uses: 100g garlic and 5 big elaichi mix with 200g juggery, the paste is given orally to cattle to treat cold and fever.

(5) Botanical Name: *Argemone mexicana* L.
 Vernacular Name: Satyanashi
 Family: Papaveraceae
 Habit: Herb
 Part used: Whole plant
Ethnoveterinary uses: (i) 200g whole plant is boiled in 2 litre water, till it remains half and then allowed to cool and drenched for two days for curing constipation in camels.
 (ii) 100 g whole plant is fed with any available local grass once a day for removal of retained placenta in cows and buffaloes.

(6) Botanical Name: *Asparagus recemosus* Willd.
 Vernacular Name: Satavar
 Family: Liliaceae
 Habit: Herb
 Part used: Whole plant
Ethnoveterinary uses: About 500g plants are given as foodstuff daily for 4-5 days for heat production in buffaloes.

(7) Botanical Name: *Azadirachta indica* A. Juss.
 Vernacular Name: Neem
 Family: Meliaceae
 Habit: Tree
 Part used: Leaves
Ethnoveterinary uses: (i) 500g tender twigs and leaves are given twice a day for 2-3 days to relieve stomach ache.
 (ii) Paste of leaves mixed with hairs and mustard oil is tied over fractured horns to heal the injury.

(8) Botanical Name: *Boerhaavia diffusa* L.
 Vernacular Name: Punarnava
 Family: Nyctaginaceae
 Habit: Herb
 Part used: Whole plant
Ethnoveterinary uses: 1500g whole plant is fed twice a day for removal of retained placenta in cows and buffaloes.

(9) Botanical Name: *Bryophyllum daigremontianum*
 (Raym. Hamet & Perrier) A. Berger
 Vernacular Name: Patherchat
 Family: Crassulaceae
 Habit: Herb
 Part used: Leaves
Ethnoveterinary uses: 100g leaves given as feedstuff twice daily to treat urinary problem in cattle.

(10) Botanical Name: *Calligonum comosum* L. Her.
 Vernacular Name: Fog

Family: Polygonaceae
 Habit: Shrub
 Part used: Whole plant
Ethnoveterinary uses: 250g plants are given as fodder twice daily for 4-5 days to treat urinary problem in cattle.

(11) Botanical Name: *Calotropis procera* (Aiton) Dryand.
 Vernacular Name: Aak
 Family: Asclepiadaceae
 Habit: Herb
 Part used: Leaves
Ethnoveterinary uses: (i) Tail of buffaloes is dipped for 4-5 minutes into latex for removal of retained placenta after delivery.
 (ii) 250g green leaves are given as feedstuff daily to kill the intestinal worm in sheep.
 (iii) Dried leaves are given as feedstuff especially in case of goat to increase the milk quantity.

(12) Botanical Name: *Capsicum frutescens* L.
 Vernacular Name: Lal mirch
 Family: Solanaceae
 Habit: Herb
 Part used: Fruit
Ethnoveterinary uses: 2-3 fruits of mirch are given with any food material once a day for 1-2 days for heat production in buffaloes

(13) Botanical Name: *Cicer arietinum* L.
 Vernacular Name: Chana
 Family: Fabaceae
 Habit: Herb
 Part used: Seed
Ethnoveterinary uses: Soaked seeds are given as feedstuff to increase the milk quantity in case of mulching cattle.

(14) Botanical Name: *Citrullus colocynthis* (L.) Schrad.
 Vernacular Name: Gadumba
 Family: Cucurbitaceae
 Habit: Herb
 Part used: Fruit
Ethnoveterinary uses: (i) 100g fruits are mixed with 50g whole plant of *Solanum surratense* and this mixture is given orally for curing dysentery. (ii) Fruits are fed to cattle for improving digestion.

(15) Botanical Name: *Cordia dichotoma* G. Forst.
 Vernacular Name: Leshwa
 Family: Boraginaceae
 Habit: Tree
 Part used: Leaves
Ethnoveterinary uses: Warmed leaves are tied over cracked nipples in case of lactating animals especially buffaloes.

(16) Botanical Name: *Cucumis callosus* (Rottler) Cogn.
 Vernacular Name: Kachri

Family: Cucurbitaceae
Habit: Herb
Part used: Fruit

Ethnoveterinary uses: 50g fruits are crushed with fresh whey and the paste is fed orally to treat stomach ache twice a day for 2-3 days especially in case of cows and buffaloes.

(17) Botanical Name: *Curcuma longa* L.
Vernacular Name: Haldi
Family: Zingiberaceae
Habit: Herb
Part used: Rhizome

Ethnoveterinary uses: 15-20 g rhizome mixed with 100 mango pickle is given twice a day for 2 days to treat general gastric problems.

(18) Botanical Name: *Cuscuta reflexa* Roxb.
Vernacular Name: Amerbel
Family: Convolvulaceae
Habit: Herb/Climber
Part used: Whole plant

Ethnoveterinary uses: Decoction of the *Cuscuta* (dodder) is applied on the infected site bitten by poisonous worm to relieve the pain in animals.

(19) Botanical Name: *Cyamopsis tetragonoloba* (L.) Taub.
Vernacular Name: Guar
Family: Fabaceae
Habit: Shrub
Part used: Seed

Ethnoveterinary uses: 1 Kg fried guar is given daily once a time in case of buffaloes to induce heat period.

(20) Botanical Name: *Elettaria cardamomum* (L.) Maton
Vernacular Name: Elachi
Family: Zingiberaceae
Habit: Shrub
Part used: Fruit

Ethnoveterinary uses: 250g juggery mixed with 8-10 elaichi and given orally once daily to horse to treat cold.

(21) Botanical Name: *Eruca vesicaria* (L.) Cav.
Vernacular Name: Taramira
Family: Brassicaceae
Habit: Herb
Part used: Whole plant

Ethnoveterinary uses: 3-4 kg of whole plant is given as feedstuff to treat mastitis in buffaloes and cows till problem is cured.

(22) Botanical Name: *Ferula asafoetida* H.Karst.
Vernacular Name: Heeng
Family: Apiaceae
Habit: Herb

Part used: Root resin

Ethnoveterinary uses: 50g resin mixed with 250g alsii oil (*Linum usitatissimum*) drenched twice a day for 2-3 days to care flatulence and gas problems.

(23) Botanical Name: *Ficus religiosa* L.
Vernacular Name: Peepal
Family: Moraceae
Habit: Tree
Part used: Bark

Ethnoveterinary uses: 500g fresh bark is boiled in 2 litre water for one hour and decoction is given orally for removal of retained placenta in buffaloes.

(24) Botanical Name: *Foeniculum vulgare* Mill.
Vernacular Name: Saunf
Family: Apiaceae
Habit: Herb
Part used: Seeds

Ethnoveterinary uses: Equal amount of fried and normal seeds are crushed and 100g powder is given twice a day for 2-3 days to treat diarrhoea.

(25) Botanical Name: *Gossypium hirsutum* L.
Vernacular Name: Binola
Family: Malvaceae
Habit: Shrub
Part used: Seed

Ethnoveterinary uses: Binola is given as dietary supplement to increase the milk quality for butter yield especially in case of buffaloes.

(26) Botanical Name: *Helianthus annuus* L.
Vernacular Name: Surajmukhi
Family: Asteraceae
Habit: Shrub
Part used: Seed

Ethnoveterinary uses: About 50 ml seed oil is given daily during pregnancy to cattle for smooth delivery.

(27) Botanical Name: *Lawsonia inermis* L.
Vernacular Name: Henna
Family: Lythraceae
Habit: Tree
Part used: Leaves

Ethnoveterinary uses: About 50g leaf powder is given with any fodder to maintain pregnancy just after fertilization for one week in buffalo.

(28) Botanical Name: *Maytenus emarginata* (Ruiz & Pav.) Loes.
Vernacular Name: Kangera
Family: Celastraceae
Habit: Tree

Part used: Leaves

Ethnoveterinary uses: Leaves are burnt and ash mixed with mustard oil is applied over cracked nipples in buffaloes and cows.

(29) Botanical Name: *Musa paradisiaca* L.

Vernacular Name: Kela

Family: Musaceae

Habit: Herb

Part used: Fruit

Ethnoveterinary uses: Tablet of camphor inserted in a ripened banana is given as feedstuff to cows and buffaloes to treat mastitis.

(30) Botanical Name: *Pennisetum glaucum* (L.) R.Br.

Vernacular Name: Bajra

Family: Poaceae

Habit: Shrub

Part used: Seed

Ethnoveterinary uses: 1 kg of fried millet is given once daily for 3-4 days for heat production in cattle.

(31) Botanical Name: *Piper nigrum* L.

Vernacular Name: Kali mirch

Family: Piperaceae

Habit: Shrub

Part used: Seed

Ethnoveterinary uses: Fine powder of piper is mixed with butter and pasted to the site bitten by poisonous worms in cattle.

(32) Botanical Name: *Plumbago zeylanica* L.

Vernacular Name: Chirayta

Family: Plumbaginaceae

Habit: Herb

Part used: Leaves

Ethnoveterinary uses: 250g dried twigs powdered with meetha soda is given orally for 2-3 days to improve appetite.

(33) Botanical Name: *Portulaca oleracea* L.

Vernacular Name: Nunia

Family: Portulacaceae

Habit: Herb

Part used: Whole plant

Ethnoveterinary uses: Whole plant is given as feedstuff to prevent excessive bleeding to buffaloes during and after delivery.

(34) Botanical Name: *Premna serratifolia* L.

Vernacular Name: Arni

Family: Lamiaceae

Habit: Shrub

Part used: Leaves

Ethnoveterinary uses: Juice of the leaves is applied on the wound to kill the germs.

(35) Botanical Name: *Prosopis cineraria* (L.) Druce

Vernacular Name: Janti

Family: Fabaceae

Habit: Tree

Part used: Bark

Ethnoveterinary uses: Poultice of dried bark is applied over pimples and wounds especially in case of goats, buffaloes and cows.

(36) Botanical Name: *Raphanus sativus* L.

Vernacular Name: Muli

Family: Brassicaceae

Habit: Herb

Part used: Whole plant

Ethnoveterinary uses: About 1 kg plant is given as fodder daily for one week to maintain pregnancy just after fertilization for one week in buffalo.

(37) Botanical Name: *Ricinus communis* L.

Vernacular Name: Arand

Family: Euphorbiaceae

Habit: Shrub

Part used: Seed

Ethnoveterinary uses: 50ml seed oil is drenched twice for 2-3 days for general gastric problems (to clean the stomach).

(38) Botanical Name: *Rosa cymosa* Tratt.

Vernacular Name: Gulab

Family: Rosaceae

Habit: Shrub

Part used: Flower

Ethnoveterinary uses: Rose petals and commercially available product 'Gulkand' is fed to increase the milk quantity especially lactating buffaloes, cows and goats.

(39) Botanical Name: *Saccharum bengalense* Retz.

Vernacular Name: Sarkanda, Jhunda, Moonj

Family: Poaceae

Habit: Herb

Part used: Leaves

Ethnoveterinary uses: 500g fodder of young leaves and green leaves are fed to animals for removal of retained placenta especially in buffaloes,

(40) Botanical Name: *Saccharum spontaneum* L.

Vernacular Name: Kans

Family: Poaceae

Habit: Herb

Part used: Whole plant

Ethnoveterinary uses: 2 kg plant is given orally as foodstuff daily for heat production in buffaloes.

(41) Botanical Name: *Salvadora persica* L.

Vernacular Name: Jaal

Family: Salvadoraceae

Habit: Tree

Part used: Leaves

Ethnoveterinary uses: Leaves are given as feedstuff twice daily to goats and cows to increase the milk production.

(42) Botanical Name: *Syzygium aromaticum* (L.) Merr. & L.M. Perry

Vernacular Name: Clove
Family: Myrtaceae
Habit: Shrub
Part used: Seed oil

Ethnoveterinary uses: Clove oil is applied over nipples to treat mastitis.

(43) Botanical Name: *Tamarix aphylla* (L.) H.Karst.

Vernacular Name: Firansh
Family: Tamaricaceae
Habit: Tree
Part used: Bark

Ethnoveterinary uses: Ash of bark mixed with Vaseline is applied over cracked nipples and any burnt injury in buffaloes.

(44) Botanical Name: *Tecomella undulata* (Sm.) Seem.

Vernacular Name: Roheda
Family: Bignoniaceae
Habit: Tree
Part used: Root

Ethnoveterinary uses: 200g root decoction is mixed with 200g root decoction of *Zizyphus nummularia* and given with juggery for refreshment of whole body in camel and buffalo.

(45) Botanical Name: *Terminalia arjuna* (Roxb. ex DC.) Wight & Arn.

Vernacular Name: Arjun
Family: Combretaceae
Habit: Tree
Part used: Bark

Ethnoveterinary uses: Paste of fresh bark is given orally for removal of retained placenta in cows and buffaloes.

(46) Botanical Name: *Terminalia chebula* Retz.

Vernacular Name: Harad
Family: Combretaceae
Habit: Tree
Part used: Fruit

Ethnoveterinary uses: (i) 20g fruits mixed with 200g methi (*Trigonella foenum-graecum*) are boiled in 2.5 litre water for half an hour and allowed to cool. 50 ml cooled decoction is given orally for 2-3 days for better digestion.

(ii) 50g each of harad, 50g ajwain and 20g black salt are powdered and drenched with human urine daily for 3-4 days to camels to relieve stomach- ache.

(47) Botanical Name: *Trachyspermum ammi* (L.) Sprague

Vernacular Name: Ajwain
Family: Apiaceae

Habit: Herb

Part used: Seed

Ethnoveterinary uses: (i) Seeds mixed with old jute bag and hairs are burnt and the camel is allowed to smoke the fumes to cure canker sores.

(ii) 100g seeds are grinded and mixed with 250g juggery and paste is given orally twice a day for removal of retained placenta in cows and buffaloes.

(iii) 20g Ajwain is mixed with 50g sugar and a piece of jute and spines of porcupine and cattle mouth is exposed to the fume to treat cold.

(48) Botanical Name: *Tribulus terrestris* L.

Vernacular Name: Bhankhri
Family: Zygophyllaceae
Habit: Herb
Part used: Whole plant

Ethnoveterinary uses: Water extract of whole plant is given orally twice a day for 2-3 days to goats for curing diarrhoea.

(49) Botanical Name: *Trigonella foenum-graecum* L.

Vernacular Name: Methi
Family: Fabaceae
Habit: Herb
Part used: Seed

Ethnoveterinary uses: 250g seeds mixed with black salt are cooked in 2 litre water and the 45-50g is given orally once a day for 4-5 days.

(50) Botanical Name: *Triticum aestivum* L.

Vernacular Name: Gehu
Family: Poaceae
Habit: Herb
Part used: Seed

Ethnoveterinary uses: 300g seed are crushed and mixed with 20g tea leaves and 100g Ashwagandha, the mixture is given to camel to treat cold for 2 days to treat cold.

(51) Botanical Name: *Vernonia cinerea* (L.) Less.

Vernacular Name: Kali jiri
Family: Asteraceae
Habit: Herb
Part used: Seed

Ethnoveterinary uses: 2 kg kali jiri 20g garlic 100g onion, 20g ginger are mixed with 200g juggery and given orally once daily to increases in appetite in cattle.

(52) Botanical Name: *Withania somnifera* (L.) Dunal

Vernacular Name: Ashwagandha
Family: Solanaceae
Habit: Shrub
Part used: Root

Ethnoveterinary uses: Root decoction is drenched once daily to camel and buffaloes to treat cold and cough.

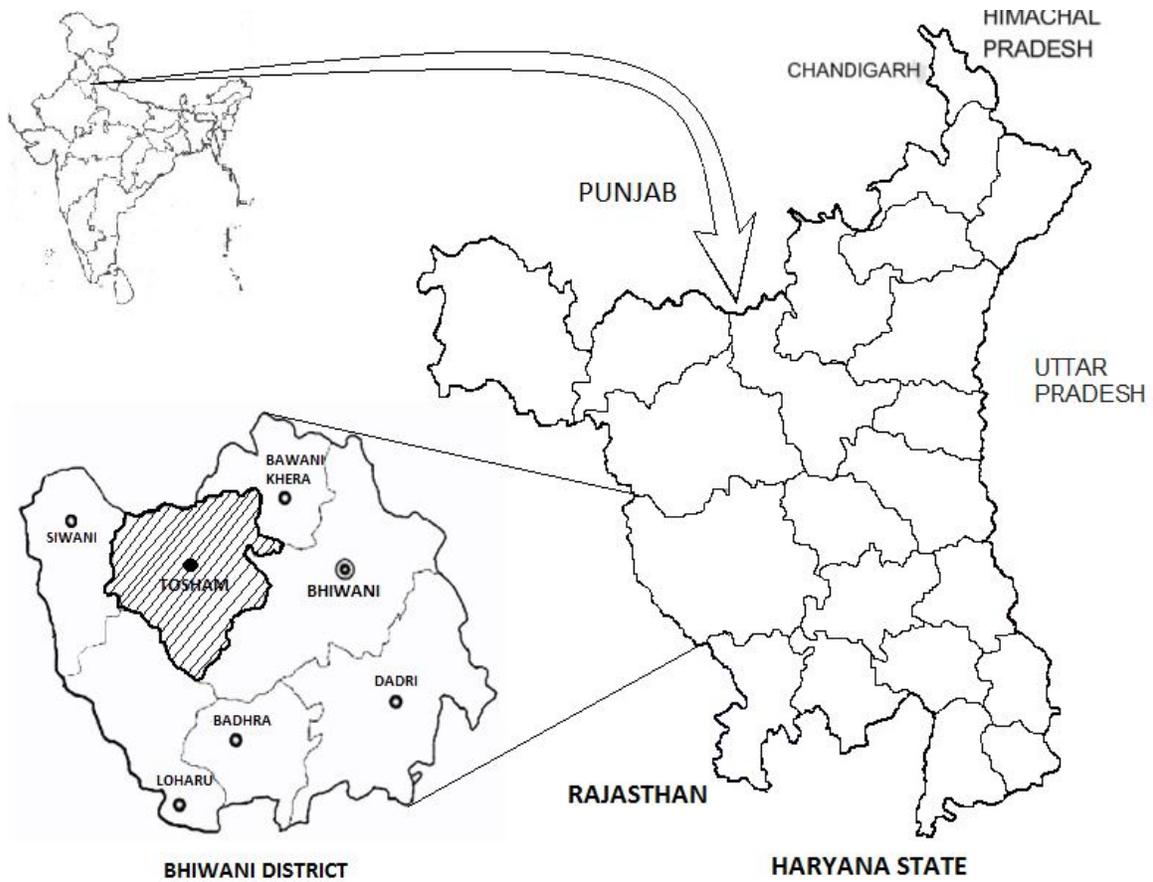


Fig 1: Showing map of the study site.

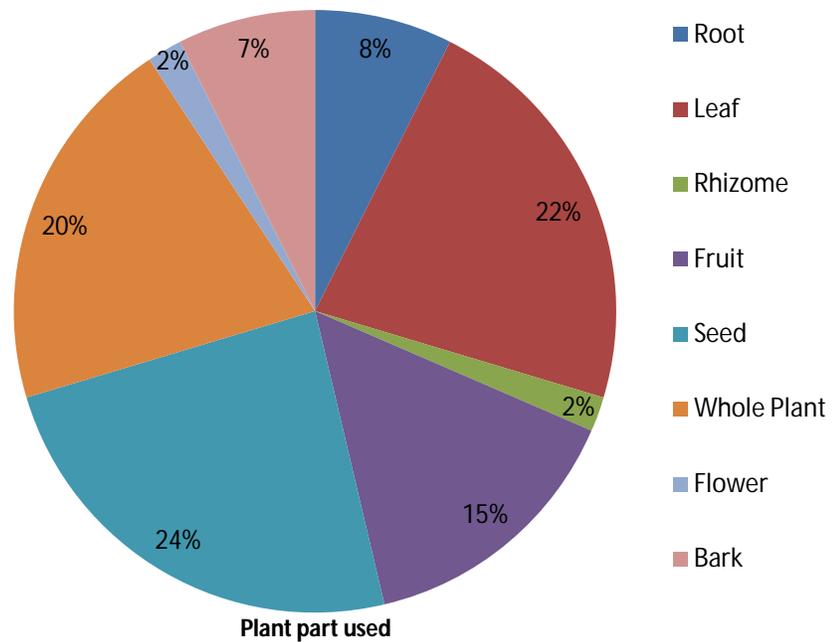


Fig 2: Parts of ethno-veterinary medicinal plants used in the study areas.

(53) Botanical Name: ***Zingiber officinale* Roscoe**
 Vernacular Name: Adrak
 Family: Zingiberaceae
 Habit: Herb
 Part used: Root

Ethnoveterinary uses: 100g ginger are mixed with jaggery and given to the cattle to treat cough or throat problem.

(54) Botanical Name: ***Zizyphus nummularia* (Burm.f.) Wight & Arn.**

Vernacular Name: Jhari ber
 Family: Rhamnaceae
 Habit: Shrub
 Part used: Whole plant

Ethnoveterinary uses: (i) 500g tender twigs and leaves are given twice a day for 5-6 days to remove intestinal worms.

(ii) 150g fruits are grinded with 10g tea twice a day for two days to treat diarrhoea in case of calves of cows, buffaloes, camels etc.

(iii) 200g root decoction is drenched with 350g jaggery once daily to camel to treat cold and cough for 3-4 days to treat cold and cough.

(iv) Decoction of root is applied on legs to treat mouth and foot diseases in buffaloes.

DISCUSSION

In present study we documented the uses of 54 medicinal plants belonging to 37 families. In this region 15 plants are used for treating various problems related with digestive system. Most commonly used plants for this purpose are *Acacia nilotica*, *Argemone mexicana*, *Azadirachta indica*, *Citrullus colocynthis*, *Plumbago zeylanica* and *Tribulus terrestris* etc. For wound healing, usage of 7 plants was reported. Placenta retention in buffaloes is a common problem in this region, 7 plants are used for expelling the retained placenta. *Boerhaavia diffusa*, *Calotropis procera*, *Saccharum* spp. is used for this purpose. 7 plants are reported to be used for treating cold, flu and fever. People of this region specifically use many plants for increasing the milk quantity. Medicinal plants such as *Asparagus recemosus*, *Cyamopsis tetragonoloba* etc. are used for inducing the heat period in buffaloes. The usages of many medicinal plants used for killing intestinal worms, facilitating smooth delivery, urinary problems, foot and mouth diseases are also documented. Some of the plants mentioned in this study are also documented in other studies conducted in adjoining regions (Ali, 1999; Takhar and Chaudhary, 2004).

Generally freshly collected plants or plant parts are used for treatment. Most commonly used parts were seeds, leaves, whole plant and fruit but in many cases roots, young twigs, bark powder, seed oil were also used for treatment. Single plant is used to treat some diseases as well as combination of two or more plants is also used to treat many other diseases. Percentage of plant parts of ethno-veterinary medicinal plants used in the study areas are given in Figure 2.

Some of the commonly used ethnoveterinary medicines are the decoction of the root of *Zizyphus nummularia* for wound

and cold, seeds of *Foeniculum vulgare* for gastric problem, juice of leaves of *Premna integrifolia* for wound worms, root decoction of *Withania somnifera* for common cough and cold, Gulkand for increasing lactation, twigs of *Argemone maxicana* given as fodder for removal of placenta, fruit of *Citrullus colocynthis* for gastric problem.

About 80% interviewed people were enriched their knowledge of traditional drugs from their parents and grandparents, and others gained from neighbours and co-producers. It has been observed that older persons and traditional healers have greater knowledge about traditional medicines than younger persons (Yadav *et al.*, 2010).

Ethnoveterinary information is in danger of extinction because of current rapid change in communities all over the world (Kubkomawa *et al.*, 2013). Excessive use of some of the wild plants is leading to the destructive harvesting and as loss of local plant diversity. Therefore, there is a need to generate awareness among the local population towards the sustainable utilization and conservation of these medicinal herbs.

The confident use of safe and effective traditional medicines may improve livestock health and productivity that will ultimately improve income and quality of life of poor households owning livestock. The development of ethnoveterinary medicine and the promotion of its rational use may improve its sociocultural status, adding to the self-esteem of its users. These findings can aid the development of indigenous knowledge and its use of various fields of study such as pharmacology, pharmacognosy, pharmaceuticals, toxicology, phytochemistry, ethnobotany, taxonomy, anthropology and veterinary science.

It is now realized that this kind of complementary medical approach is crucial and necessary to boost livestock production at community level (Abebe *et al.*, 2003). Formal research in ethnoveterinary medicine will no doubt help to confirm the claims made by ethnoveterinarians with respect to the efficacy of ethnoveterinary treatments by ethnoveterinarians.

The findings presented in this paper are very preliminary and needs further authentication. Pharmacological investigation of ethnoveterinary medicines will shed light on the relationship between ethnoveterinary knowledge and modern mainstream pharmacology and pharmaceuticals. Such information will not only promote the development of useful concepts in veterinary medicine but also encourage the maintenance of bio-cultural diversity.

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