



**Full Length Article**

# Documentation of Ethnoveterinary Practices Used for Treatment of Different Ailments in a Selected Hilly Area of Pakistan

ZIA-UD-DIN SINDHU<sup>1</sup>, ZAFAR IQBAL, MUHAMMAD NISAR KHAN, N.N. JONSSON<sup>†</sup> AND MUHAMMAD SIDDIQUE<sup>‡</sup>  
*Department of Parasitology, University of Agriculture, Faisalabad, Pakistan*

<sup>†</sup> *Scottish Centre for Production Animal Health and Food Safety, Faculty of Veterinary Medicine, University of Glasgow, UK*

<sup>‡</sup> *Department of Microbiology, University of Agriculture, Faisalabad, Pakistan*

<sup>1</sup>Corresponding author's email: ziasandhu@hotmail.com

## ABSTRACT

In the present study, the in vogue ethnoveterinary practices in the Mansehra District of Pakistan were documented. Results revealed that 35 plant species representing 25 families were used in the area to treat the ailing animals. Most frequently used plants were from the families Apiaceae, Brassicaceae, Compositae, Pinaceae, Poaceae and Verbenaceae families. Other commonly used ingredients of ethnoveterinary prescriptions were; used engine oil, butter, mineral salt, lasi, kafor, yogurt, milk and buffalo's urine. The most frequent ethnoveterinary practices were recorded for the treatment of gastrointestinal helminthiasis, tick and lice infestation, myiasis, mange and pneumonia. © 2010 Friends Science Publishers

**Key Words:** Ethnoveterinary; Livestock; Plant; Documentation; Mansehra

## INTRODUCTION

Since cave age humans are treating their animals using traditional veterinary medicine, but this knowledge was only recorded properly in recent times. The descriptive reports on observation and experiences of traditional animal health knowledge published before 1950 had never clearly used any technical term to define this type of knowledge, which was later termed as 'ethnoveterinary' by McCorkle (1986). Ethnoveterinary medicine (EVM) comprises all the approaches applied by humans to improve their livestock production, like breeding practices, animal feed technology, ritualism, herbalism, spiritualism and ethno epidemiological knowledge on livestock diseases. Ethno-veterinary knowledge (EVK) reflects people's experience in life and is believed to be the property of specific community/family. EVK is stored in the memory of people and passed on from generation to generation verbally (Wanzala *et al.*, 2005). Farmers and pastoralists have a long history of the use of traditional medicines and they have deep knowledge of their environment (Nfi *et al.*, 2001). Medicinal plants for several centuries have been widely used for treatment of diseases. Even today, in African countries 95% of traditional medical preparations are of plant origin (Hoareau & DaSilva, 1999; Giday *et al.*, 2003; Ole-Miaron, 2003).

To date, numerous reports are available on medicinal activity of plants (Akhtar *et al.*, 2000). Treatment of gastrointestinal helminthiasis, fever, various nervous problems, rheumatism, skin diseases, chronic fever, cough,

eczema and dyspepsia has been reported in literature with plants like; *Caesalpinia crista*, *Saussurea lappa*, *Melia azedarach*, *Trachelospermum jasminoides*, *Moringa oleifera*, *Butea frondosa* etc., (Anonymous, 1956; Chopra, 1956; Ikram & Hussain, 1978). Plants like; *Peganum harmala* (Said, 1969), *Mallotus philippinensis* (Ikram & Hussain, 1978; Akhtar & Ahmad, 1992), *Punica granatum* (Akhtar & Riffat, 1985), *Lagenaria siceraria* (Awan, 1981), *Adhatoda vesica* (Lateef *et al.*, 2003) and many others are well known for their anthelmintic activity (for review see; Nadkarni, 1954; Chopra *et al.*, 1956; Said, 1969; Akhtar *et al.*, 2000). Similarly a number of plants have been identified for having acaricidal activity (Sutherst *et al.*, 1982; Hassan *et al.*, 1994; Cruz-Vazquez & Ruvalcaba, 2000; Webb & David, 2002; Muro *et al.*, 2003). Use of different medicinal plants for treatment of various ailments of animals is an integral part of EVM.

Majority of Pakistani livestock farmers are poor and own 5-6 animals per family (Anonymous, 2006). Most of these farmers can not afford modern allopathic drugs due to economic constrains, which ultimately leads to poor livestock production and economic losses due to poor health of animals. Under such circumstances, EVM can be promoted as an alternative of modern drugs and it will help in poverty alleviation by empowering the people to use their own resources for treatment of their livestock. Livestock farmers all over the Pakistan can draw on over 4000 years of knowledge and experience. But this needs to be documented on priority basis as this valuable knowledge is disappearing,

because of rapid socio-economic and ecological changes and also as a result of the loss of cultural heritage under the guise of civilization (McCorkle & Mathias-Mundy, 1992; Nfi *et al.*, 2001). Some workers have documented the indigenous ethnoveterinary practices in different parts of Pakistan (Jabbar *et al.*, 2006; Tabassam *et al.*, 2006; Farooq *et al.*, 2007; Dilshad *et al.*, 2008), but still documentation is required to be done in many parts of the country to conserve. Objective of this study was to document the use of indigenous plants with particular reference to control of parasites in some hilly areas of Pakistan.

## MATERIALS AND METHODS

**Study area:** Natural features of Pakistan range from the sandy beaches and mangrove swamps in south to icy peaks of Himalaya and other mountains in the north; allowing different landscapes and climates with variety of flora and fauna. This study was conducted in the District Mansehra of North-West Frontier Province of Pakistan (Hilly areas). Documentation was done in three regions of this district i.e., Mansehra, Balakot and the Kaghan Valley. Mansehra is located at 34°-12' and 35°-50' and 47°-07' longitude. It is home to different ethnic groups like; Afghans, Pashtuns, Turks, Hazaras, Kashmiris, Hindko, Tanolis, Rajputs, Arians etc. Leading distinctive features of District Mansehra are its mountain ranges, natural lakes and the valleys.

**Data collection:** Officials of the livestock research station Jabbah, Mansehra were contacted for guidance. For identification of key respondents a reconnaissance survey-a small-scale rural rapid appraisal (RRA) phase was conducted (Jabbar *et al.*, 2006). A list of veterinarians, local healers and farmers, identified by RRA was prepared. For documentation of EVM, a multidisciplinary team was formed comprising of interviewer, veterinary officer from local livestock research station and guide from local area.

Data was obtained in the following areas: (a) use of plants for EVM especially for control of insects/parasites, (b) source of plant material, part of the plant used, the method of medicinal preparation and route of administration (c) persons having knowledge of EVM. Eighty seven respondents including traditional veterinary healers, veterinary officers and veterinary assistants participated in the study and reported 61 indigenous recipes (Table I). Botanical samples of the plants, mentioned by the respondents were collected from field and identified by a botanist in University of Agriculture, Faisalabad, Pakistan.

## RESULTS

Bleeding, foot and mouth disease, gastrointestinal helminthiasis, mange, myiasis, pain, pediculosis, pneumonia, tick infestation and uterine prolapse were ten common conditions/ailments of animals for which traditional prescriptions are usually being used in the area. Recorded data led to the documentation of 35 plant species representing

25 families (Table II). The most frequently reported (>15 times) plants represented Apiaceae, Brassicaceae, Compositae, Pinaceae, Poaceae and Verbenaceae families. Materials other than plants including used engine oil, butter, mineral salt, lasi, kafor, yogurt, milk, buffalo's urine were used either independently or in combinations.

The most frequently reported ( $\geq 10$  times) plant species used for ethnoveterinary practices were *Allium sativum*, *Trachyspermum ammi* (L.) Sprague, *Brassica campestris*, *Eclipta prostrata*, *Cedrus deodara*, *Zea mays*, *Vitex negundo*, *Prunus persica*, *Daphne mucronata* and *Zingiber zerumbet*. Seeds, leaves, root, bark, bulb, oil extract, fruit and rhizome were the frequently used parts of the plants. Ethnoveterinary prescriptions were commonly prepared by grinding, crushing, preparing the decoction in water or any vegetable oil (preferably *Brassica campestris* oil) and mixing the ingredients as such. The commonly used modes of administration were feeding/drenching and topical application.

## DISCUSSION

Most of the people using the plant species to treat the animals got this knowledge from their forefathers, with exception of few, who learned it from others or by hit and trial method. The people who participated in this study were smallholders and could not afford modern drugs. So it was easy for them to get plants from local area and to treat their livestock with home made recipes. That is why, due to poor purchasing power of farmers its thought that integration of scientifically validated ethnoveterinary practices in livestock farming system in rural areas may help in poverty alleviation and increasing the livestock production (Iqbal *et al.*, 2005; Mathias, 2007). During the present study it has been observed that farmers prefer to collect the required plant directly from field, depending upon season and availability of plant. It has also been observed that some plants are very popular in particular areas e.g., trees of *C. deodara* are abundant. So the farmers can easily collect the wood to extract oil, which is being used for treatment of tick infestation, mange and gastrointestinal helminthiasis.

The communities included in the present study were traditionally rural in nature. Therefore, the farmers were quite rich in the knowledge of diversity of EVPs for animal health and production. Use of different plants for management of ecto- and endo-parasites has been documented earlier in different parts of world (Lans & Brown, 1998; Adewunmi *et al.*, 200; Ch *et al.*, 2006) but in Pakistan only few reports are available on documentation of EVPs (Jabbar *et al.*, 2006; Farooq *et al.*, 2007). Thus the present study was first of its kind in which EVPs for control of parasites in hilly areas of Pakistan.

The mode of preparation of EVM depends on active ingredient to be extracted, route of administration and the medical intent (prophylaxis or therapy) (McCorkle & Mathias-Mundy, 1992). Part of the plant to be used, depends

**Table I: List of ethnoveterinary practices (EVPs)/prescriptions used by people in hilly area (District Mansehra) for treatment of different ailments/conditions of animals**

Vernacular name of plant	Scientific name	Disease treated	Animals	Part used	Preparation and administration	Farmers using the EVPs (%)
Ghnola, ghanorr		Myiasis	Sheep	Root	Grind the dried root in fine powder; put two pinches in wound	6
Lada		Gastrointestinal helminthiasis	Cattle, sheep, goat, buffalo	Root	Prepare the decoction of root; batter the flour with decoction; give 70 g per oz	6
Lada		Tick infestation	Cattle, sheep, goat, buffalo	Root	Prepare the decoction of root; batter the flour with decoction; give 70 g per oz	9
Musk kafor		Myiasis	Cattle, buffalo, sheep, dog		Wet one tablet in water and then put in wound	14
Jawa (kerwiseron)	<i>Alhagi maurorum</i>	Gastrointestinal helminthiasis	Sheep	Seed	Grind and mix 50 g of jawan in 250 ml of lasi; dmimnister per oz	6
Garlic	<i>Allium sativum</i>	Tick infestation	Cattle, buffalo	Bulb	Administer 125 g pounded bulb per oz	14
Garlic	<i>A. sativum</i>	Gastrointestinal helminthiasis	Sheep, cattle, buffalo	Bulb	Ground 250 g garlic bulb in 250 ml of lasi; administer per oz (half dose for sheep)	6
Bari allaiche	<i>Anomum subulatum</i>	Gastrointestinal helminthiasis	Sheep	Fruit	Grind one dried fruit into fine powder and administer orally	10
Soro ganda	<i>Arisaema flavum</i>	Myiasis	Cattle, buffalo, sheep	Root	Ground the dried root into fine powder; put two pinches of powder in open wound	6
Nara	<i>Arundo donax L.</i>	Gastrointestinal helminthiasis	Sheep	Leaf	Pound a hand full of leaves in pestle and mortar; soak in 250 ml water for 24 h; administer the water per oz	6
Sumbal	<i>Berberis lycium L.</i>	Myiasis	Cattle, buffalo, sheep	Root	Grind the dried root into fine powder; put 5 g in wound	6
Bhat pewa	<i>Bergenia ciliate</i>	Gastrointestinal helminthiasis	Sheep	Leaf	Feed about 250 g per oz	9
Mustard oil	<i>Brassica campestris</i>	Pediculosis	Cattle, buffalo	Oil	Mix 1 l oil with 4 kg yogurt and administer per oz	6
Mustard oil	<i>B. campestris</i>	Pediculosis	Cattle, buffalo	Oil	Mix the mustard oil with milk and butter (1 kg each) and administer per oz	6
Mustard oil	<i>B. campestris</i>	Gastrointestinal helminthiasis	Buffalo	Oil	Administer 1 lit mustard oil per oz	6
Mustard oil	<i>B. campestris</i>	Pediculosis	Cattle, buffalo	Oil	Add some mineral salt in mustard oil and topically apply on affected area	6
Mustard oil	<i>B. campestris</i>	Mange	Cattle, buffalo, sheep	Oil	Topical application of oil	6
Mustard oil	<i>B. campestris</i>	Gastrointestinal helminthiasis	Cattle, buffalo	Oil	Administer 2 table spoons of oil to calf just after birth	6
Bhang	<i>Cannabis sativa</i>	Pediculosis, tick infestation	Cattle, buffalo	Leaf	Grind 2 kg leaf with 1 kg mineral salt; burn it in tandoor and divide in 14 equal parts; administer per oz, twice a week	6
Bhang	<i>C. sativa</i>	Uterine prolapse after birth	Cattle, buffalo	Leaf	Grind 50 g leaf in 250 ml of water and administer per oz after parturition	6
Dear	<i>Cedrus deodara</i>	Protection of stored products		Wood	Place a small piece of wood in stored grains	6
Loo	<i>C. deodara</i>	Tick infestation, mange, pediculosis, fungal growth	Cattle, buffalo, sheep	Wood oil	Topical application on affected area	41
Loo	<i>C. deodara</i>	Gastrointestinal helminthiasis	Cattle, buffalo, sheep	Wood oil	Administer 2 table spoon per oz	6
Loo	<i>C. deodara</i>	Pediculosis		Wood oil	Mix the wood oil in equal quantity of buffalo's urine; apply topically	6
Loo	<i>C. deodara</i>	Mosquito repellent	Human	Wood oil	Topical application of wood oil	6
Loo	<i>C. deodara</i>	fungal growth	Cattle, buffalo, sheep	Wood oil	Topical application on affected area	6
Loo	<i>C. deodara</i>	Mange	Sheep	Wood oil	Mix 2 table spoons of wood oil in 250 g yogurt and administer per oz	6
Kute lal	<i>Daphne mucronata</i>	Pediculosis	Cattle, buffalo, human	Leaf	Ground the fresh leaves in pestle and mortar; topically apply the water extracts from leaves during pounding	9
Kute lal	<i>D. mucronata</i>	Gastrointestinal helminthiasis	Sheep	Leaf	Grind 250 g leaves after adding 250 ml of water; filter and administer per oz	6
Knis	<i>Dioscorea deltoidea</i>	Myiasis	Cattle, buffalo, sheep	Arial parts	Ground the dried plant into fine powder; put two pinches of powder in open wound	6
Bhangri	<i>Eclipta prostrate</i> Linn.	Pneumonia	Sheep	Arial parts	Prepare a decoction of arial parts and administer 250 ml per oz	23
Hing	<i>Ferula assafoetida L.</i>	Gastrointestinal helminthiasis	Sheep, goat	Resin	Crush into fine powder and administer about 5 g	6
Dhaman (tree)	<i>Grewia optiva</i>	Gastrointestinal helminthiasis	Cattle, buffalo, sheep, goat	Bark	Pound the hand full of bark and soak in 250 ml of water; left it overnight; administer per oz	6
i. Garlic	i. <i>A. sativum</i>	Tick infestation	Cattle, buffalo	i. Bulb	Pound 250gm of garlic bulb to make a paste; mix that paste in corn flour (whole) and administer per oz	14
ii. Corn	ii. <i>Zea mays L.</i>			ii. Seed		
i. Red chili	i. <i>Capsicum annum L.</i>	Tick infestation		i. Fruit	Mix red chili, mineral salt and mustard oil (50 g each) and administer per oz	6
ii. Mustard oil	ii. <i>B. campestris</i>			ii. Oil		

Table I: Continued

**Table I: Continued**

Vernacular name of plant	Scientific name	Disease treated for	Animals	Part used	Preparation and administration	Farmers using the EVPs (%)
i. Ajwain ii. Suund iii. Saunf iv. Zeera	i. <i>Trachyspermum ammi</i> ii. <i>Zingiber zerumbet</i> iii. <i>Foeniculum vulgare</i> Mill. iv. <i>Cuminum cyminum</i> L.	Pneumonia	Cattle, buffalo	i. Seed ii. Rhizome iii. Seed iv. Seed	Mix equal quantity of ajwain, saunf, zerra and black salt (75 g) in 500 g of gur; boil all this in 2 l of milk and administer per oz	9
i. Timber ii. Ajwain i. Timber ii. Suund i. com ii. Mustard oil Mehndi/heena	i. <i>Zanthoxylum armatum</i> DC. ii. <i>T. ammi</i> i. <i>Z. armatum</i> ii. <i>Z. zerumbet</i> i. <i>Z. mays</i> ii. <i>B. campestris</i> <i>Lawsonia inermis</i>	Pneumonia Tick infestation Mange Tick infestation, pediculosis	Cattle, sheep Cattle, buffalo Buffalo Cattle, buffalo, sheep	i. arial parts ii. seed i. Arial parts ii. Rhizome i. seed ii. Oil Leaf	Boil 25 of ajwain seeds + equal quantity of timber in 1 l of Lasi; administer per oz Mix equal quantity (50 g) of both plants with mineral salt and grind in 200 ml of water; dminister per oz Mix equal quantities of mustard oil, gur and corn flour (whole) and cook on stove; administer per oz Soak the fresh leaves in water and left over night; feed 10 leaves; repeat twice on daily basis	3 6 6 6
Mehndi/heena	<i>L. inermis</i>	Tick infestation, pediculosis	Cattle, buffalo, sheep	Leaf	Grind the dried leaf into fine powder; add water to prepare a paste; topically apply the past on affected area	6
Memaikh Cheer	<i>Paeonia emodi</i> L. <i>Pinus roxburgii</i>	Pain Myiasis	Sheep, man Cattle, buffalo, sheep	Root Resin	Prepare a decoction of leaf and drench per oz Put the small amount (approx. about the size of small tablet) of resin in wound	6 6
Bankhakri	<i>Podophyllum emodi</i>	Myiasis	Sheep	Arial parts	Ground the arial parts in fine powder; put two pinches in wound	6
Arro	<i>Prunus persica</i>	Myiasis	Cattle, buffalo, sheep	Leaf	Pound the twigs after adding some water; put that water in wound	14
Jamal ghot	<i>Ricinus communis</i>	Gastrointestinal helminthiasis	Sheep, goat	Seed	Crush two seeds into fine powder and administer orally	5
Jamal Ghot	<i>R. communis</i>	Gastrointestinal helminthiasis	Sheep	Seed	Crush two seeds in mortar and pestle and administer orally	5
Rind	<i>R. communis</i>	Myiasis	Cattle, buffalo, sheep	Seed	Crush the seeds to extract oil and put the few drops of oil in wound	9
Hola	<i>Rumex hastatus</i>	Myiasis	Cattle, buffalo, sheep	Root	Pound the fresh root after adding some water; put few ml of water in wound	9
Hola	<i>R. hastatus</i>	External bleeding	Animals and human	Root	Pound the root to extract water from root; put few drops of water on wound to stop the bleeding	6
Kouth, quste shareen	<i>Saussuria lappa</i>	Gastrointestinal helminthiasis	Cattle, buffalo, sheep	Root	Mix one table spoon of powdered root in 250 ml of water; administer per oz	6
Mori	<i>Solanum xanthocarpum</i>	Pneumonia	Cattle, buffalo	Arial parts	Burn the arial parts into ash; administer 10 g per oz. once a day for three days	6
Ajwain	<i>T. ammi</i>	Tick infestation, pediculosis	Cattle, buffalo, sheep	Seed	Grind 100 g seeds and leave the powder in open for three days; administer per oz	6
Ajwain Mervani	<i>T. ammi</i> <i>Vitex negundo</i>	Pneumonia Mange	Cattle, buffalo Cattle, buffalo, sheep	Seed Leaf	Add 75 g seed in 3 l lassi and administer per oz Pound the leaves well in pestle and mortar; topically apply the pounded material	9 18
Com	<i>Z. mays</i>	Tick infestation, pediculosis	Cattle, sheep	Seed	Make the balls from the whole <i>Zea mays</i> flour by mixing adequate amount of water; leave that ball in open for 12 h; administer 100 g per oz	14

**N.B:** Doses mentioned are for large animals, while for small animals usually half amount is used

on type of plant and disease to be cured. In EVM every part of the plant is used like roots, bark, wood, leaves, stem, flowers, fruit, juice, resin, latex, grains, buds, bulbs and seeds (Nfi *et al.*, 2001; Giday *et al.*, 2003; Ole-Miaron, 2003; Vieg *et al.*, 2003). But regime of dosage of ethnoveterinary recipes is not yet standardized. Basically the farmers decide the dose and method of administration according to intensity of disease and size of animal. Doses were often mentioned as handful and bottle full for large ruminants and small ruminants usually receive the half of the dose recommended for large ruminants. All the farmers measured the doses for their prescription as handful or bottleful. This dose measurement method is not appropriate and handful quantity varies depending upon the size of particular person's hand. That is why EVM is subjected to criticism by the veterinarians (Niwa *et al.*, 1991; Bakhiet & Adam, 1995; Longuefosse & Nossin, 1996).

Various vehicles used for drug administration used in were milk, butter, vegetable oil or lasi. Selection of the

vehicle depends upon availability of material at home, as farmers do not have to pay for it. Research needs to be conducted on proper standardization of doses and selection of vehicles to reduce the risk of drug toxicity to animals and development of resistance in pathogens. This will also help in reducing the cost of treatment in cases, where ingredients are purchased from market. In all the prescriptions documented during the present study, plants were processed by grating, boiling and burning the material. But there is no standard time/condition for boiling, burning or grating the plant material, which needs to be standardized for better efficacy of these prescriptions.

It was also observed during the study that farmers were well familiar with the symptomatic diagnosis of different ailments as endorsed by the veterinarian who was a member of the survey team. But overall the use of EVMs for treatment of parasitic diseases was more frequently recorded in comparison to the treatment of other ailments. Among parasitic problems, farmers reported ectoparasites more frequently than endoparasites and other diseases. This

**Table II: Plants used in the hilly area (District Mansehra) for treatment of different conditions/ailments in ethnoveterinary medicine system**

Family	Scientific name	Vernacular name	Part used	Diseases treated
Alliaceae	<i>Allium sativum</i>	Garlic	Bulb	Tick infestation, gastrointestinal helminthiasis
Apiaceae	<i>Cuminum cyminum</i>	Zeera	Seed	Pneumonia
Apiaceae	<i>Ferula assafoetida</i>	Hing	Resin	Gastrointestinal helminthiasis
Apiaceae	<i>Foeniculum vulgare</i>	Saunf	Seed	Pneumonia
Apiaceae	<i>Trachyspermum ammi</i>	Ajwain	Seed	Pneumonia, tick infestation, pediculosis
Araceae	<i>Arisaema flavum</i>	Soro ganda	Root	Myiasis
Asteraceae	<i>Saussuria lappa</i>	Kooth, quste sharing	Root	Gastrointestinal helminthiasis
Berberidaceae	<i>Berberis lycium</i>	Sumbal	Root	Myiasis
Brassicaceae	<i>Brassica campestris</i>	Mustard oil	Oil	Pediculosis, tick infestation, gastrointestinal helminthiasis, mange
Cannabaceae	<i>Cannabis sativa</i>	Bhang	Leaf	Pediculosis, tick infestation, uterine prolapse after birth
Compositae	<i>Eclipta prostrata</i> Linn.	Bhangri	Arial parts	Pneumonia
Dioscoreaceae	<i>Dioscorea deltoida</i>	Knis	Arial parts	Myiasis
Euphorbiaceae	<i>Ricinus communis</i>	Jamal ghoti	Seed	Gastrointestinal helminthiasis
Euphorbiaceae	<i>Ricinus communis</i>	Arind	Seed	Myiasis
Fabaceae	<i>Alhagi maurorum</i>	Jawa (kerwi serson)	Seed	Gastrointestinal helminthiasis
Lythraceae	<i>Lawsonia inermis</i>	Mehndi, heena	Leaf	Tick infestation, pediculosis
Paeoniaceae	<i>Paeonia emodi</i> L.	Mameikh	Root	Pain
Pinaceae	<i>Cedrus deodara</i>	Loo	Wood oil, wood	Tick infestation, mange, gastrointestinal helminthiasis, protection of stored grains
Pinaceae	<i>Pinus roxburgii</i>	Cheer	Resin	Myiasis
Poaceae	<i>Arundo donax</i>	Nara	Leaf	Gastrointestinal helminthiasis
Poaceae	<i>Zea mays</i>	Makai	Seed	Tick infestation, mange
Podophyllaceae	<i>Podophyllum emodi</i>	Bankhakri	Arial parts	Myiasis
Polygonaceae	<i>Rumex hastatus</i>	Hola	Root	Myiasis, coagulant
Rosaceae	<i>Prunus persica</i>	Arro	Leaf	Myiasis
Rutaceae	<i>Zanthoxylum armatum</i>	Timber	Arial parts	Pneumonia, tick infestation
Saxifragaceae	<i>Bergenia ciliata</i>	Bhat pewa	Leaf	Gastrointestinal helminthiasis
Solanaceae	<i>Capsicum annuum</i>	Red chili	Fruit	Tick infestation
Solanaceae	<i>Solanum xanthocarpum</i>	Mori	Arial parts	Pneumonia
Thymelaeaceae	<i>Daphne mucronata</i>	Kute lal	Leaf	Pediculosis, gastrointestinal helminthiasis
Tiliaceae	<i>Grewia optiva</i>	Dhaman (tree)	Bark	Gastrointestinal helminthiasis
Verbenaceae	<i>Vitex negundo</i>	Marvani	Leaf	Mange
Zingiberaceae	<i>Amomum subulatum</i>	Bari allaiche	Fruit	Gastrointestinal helminthiasis
Zingiberaceae	<i>Zingiber zerumbet</i>	Suund	Rhizome	Tick infestation, pneumonia

could be due to the fact that ecto parasites are present on the external body parts and can be diagnosed easily, as compared to other ailments of animals. This could be a reason for that more EVPs were recorded for treatment of ectoparasites than any other ailment.

## REFERENCES

- Adewunmi, C.O., J.M. Agbedahunsi, A.C. Adebajo, A.J. Aladesanmi, N. Murphy and J. Wando, 2001. Ethno-veterinary medicine: screening of Nigerian medicinal plants for trypanocidal properties. *J. Ethnopharmacol.*, 77: 19–24
- Akhtar, M.S. and I. Ahmad, 1992. Comparative efficacy of *Mallotus philippinensis* fruit (kamala) or Nilzan® drug against gastrointestinal cestodes in beetal goats. *Small Ruminant Res.*, 8: 121–128
- Akhtar, M.S. and S. Riffat, 1985. Efficacy of *Punica granatum*, Linn. (Anar) fruit-rinds against naturally acquired nematodal and cestodal infections. *J. Pharm. Punjab University Lahore Pakistan*, 6: 17–24
- Akhtar, M.S., Z. Iqbal, M.N. Khan and M. Lateef, 2000. Anthelmintic activity of medicinal plants with particular reference to their use in animals in the Indo-Pakistan subcontinent. *Small Ruminant Res.*, 38: 99–107
- Anonymous, 1956. *Wealth of India—Raw Materials*, Vol. 1, p: 122. Council of Scientific and Industrial Research, New Delhi, India
- Anonymous, 2006. *Pakistan Livestock Census, 2006*. Agricultural Census Organization, Ministry of Economic Affairs and Statistics, Pakistan
- Awan, M.H., 1981. *Kitab-ul-Mufarradat*. Sheikh Ghulam Ali and Sons Publishers, Lahore, Pakistan
- Bakhiet, A.O. and S.E.I. Adam, 1995. Therapeutic utility, constituents and toxicity of some medicinal plants. *Vet. Human Toxicol.*, 37: 255–258
- Ch, M.I., M.A. Khan and H. Wajahat, 2006. Ethno veterinary medicinal uses of plants from Samahni valley dist. Bhimber, (Azad Kashmir) Pakistan. *Asian J. Plant Sci.*, 5: 390–396
- Chopra, R.N., 1956. *Glossary of Indian Medical Plants*. Council of Scientific and Industrial Research, New Delhi, India
- Cruz-Vazquez, C. and M. Fernandez Ruvalcaba, 2000. Anti-tick repellent effect of *Andropogon gayanus* grass on plots of different ages experimentally infested with *Boophilus microplus* larvae. *Parasitologia al Dia*, 24: 88–91
- Dilshad, S.M.R., Najeeb-ur-Rehman, Z. Iqbal, G. Muhammad, A. Iqbal and N. Ahmed, 2008. An inventory of the ethnoveterinary practices for reproductive disorders in cattle and buffaloes, Sargodha district of Pakistan. *J. Ethnopharmacol.*, 117: 393–402
- Farooq, Z., Z. Iqbal, S. Mushtaq, G. Muhammad, M.Z. Iqbal and M. Arshad, 2007. Ethnoveterinary practices for the treatment of parasitic diseases in livestock in Cholistan desert (Pakistan). *J. Ethnopharmacol.*, 118: 213–219
- Giday, M., Z. Asfaw, T. Elmqvist and Z. Woldu, 2003. An ethnobotanical study of medicinal plants used by the Zay people in Ethiopia. *J. Ethnopharmacol.*, 85: 43–52
- Hassan, S.M., O.O. Dipeolu and M.M. Malonza, 1994. Natural attraction of livestock ticks by the leaves of a shrub. *Trop. Anim. Health Prod.*, 26: 87–91
- Hoareau, L. and E.J. DaSilva, 1999. Medicinal plants: a re-emerging health aid. *Electron. J. Biotechnol.*, 2: 1–6
- Ikram, M. and S.F. Hussain, 1978. *Compendium of Medicinal Plants*. Pakistan Council Science Industrial Research, Peshawar, Pakistan

- Iqbal, Z., A. Jabbar, M.S. Akhtar, G. Muhammad and M. Lateef, 2005. Possible role of ethno veterinary medicine in poverty reduction in Pakistan: Use of botanical anthelmintics as an example. *J. Agric. Soc. Sci.*, 1: 187–195
- Jabbar, A., M.A. Raza, Z. Iqbal and N. Khan, 2006. An inventory of the ethnobotanicals used as anthelmintics in the southern Punjab (Pakistan). *Journal of Ethnopharmacol.*, 108: 152–154
- Lans, C. and G. Brown, 1998. Ethnoveterinary medicines used for ruminants in Trinidad and Tobago. *Preventive Vet. Med.*, 35: 149–163
- Lateef, M., Z. Iqbal, M.N. Khan, M.S. Akhtar and A. Jabbar, 2003. Anthelmintic activity of *Adhatoda vesica* roots. *Int. J. Agri. Biol.*, 5: 86–90
- Longuefosse, J.L. and E. Nossin, 1996. Medical ethnobotany survey in Martinique. *J. Ethnopharmacol.*, 53: 117–120
- Mathias, E., 2007. Ethnoveterinary medicine in the era of evidence-based medicine: Mumbo-jumbo, or a valuable resource? *Vet. J.*, 173: 241–242
- McCorkle, C.M. and E. Mathias-Mundy, 1992. Ethnoveterinary medicine in Africa. *African J. Int. African Inst. (London)*, 62: 59–93
- McCorkle, C.M., 1986. An introduction to ethnoveterinary research and development. *J. Ethnobiol.*, 6: 129–149
- Muro, C.F., C. Cruz-Vazquez, M. Fernandez-Ruvalcaba, J. Molina-Torres, C.J. Soria and P.M. Ramos, 2003. Repellence of *Boophilus microplus* larvae in *Stylosanthes humilis* and *Stylosanthes hamata* plants. *Parasitologia Latinoamericana*, 58: 118–121
- Nadkarni, A.K., 1954. *Indian Materia Medica*, Vol. I, 3<sup>rd</sup> edition, pp: 142–143. Popular Book Depot., Bombay, India
- Nfi, A.N., J.N. Mbanya, C. Ndi, A. Kameni, M. Vabi, D. Pingpoh, S. Yonkeu and C. Moussa, 2001. Ethnoveterinary medicine in the Northern Provinces of Cameroon. *Vet. Res. Commun.*, 25: 71–76
- Niwa, Y., Y. Miyachi, K. Ishimoto and T. Kanoh, 1991. Why are natural plant medicinal products effective in some patients and not in others with same disease. *Planta Med.*, 57: 299–304
- Ole-Miaron, J.O., 2003. The Maasai ethnodagnostic skill of livestock diseases: a lead to traditional bioprospecting. *J. Ethnopharmacol.*, 84: 79–83
- Said, M., 1969. *Hamdard Pharmacopea of Eastern Medicine*. Hamdard National Foundation
- Sutherst, R.W., R.J. Jones and H.J. Schnitzerling, 1982. Tropical legumes of the genus *Stylosanthes* immobilize and kill cattle ticks. *Nature*, 295: 320–321
- Tabassam, S.M., Z. Iqbal, A. Jabbar, Z. Ud-Sindhu and R.Z. Abbas, 2006. Documentation of ethnoveterinary practices and evaluation of *Azadirachta indica* for treatment of sheep mange. 12<sup>th</sup> AAAP Animal Science Congress, Bexco, Busan, Korea
- Viegi, L., A. Pieroni, P.M. Guarrera and R. Vangelisti, 2003. A review of plants used in folk veterinary medicine in Italy as basis for a databank. *J. Ethnopharmacol.*, 89: 221–244
- Wanzala, W., K.H. Zessin, N.M. Kyule, M.P.O. Baumann, E. Mathias and A. Hassanali, 2005. Ethnoveterinary medicine: a critical review of its evolution, perception, understanding and the way forward. *Livestock Res. Rural Dev.*, 17: 119
- Webb, E.C. and M. David, 2002. The efficacy of neem seed extract (*Azadirachta indica*) to control tick infestation in Tswana, Simmentaler and Brahman cattle. *South African J. Anim. Sci.*, 32: 1–6

(Received 31 December 2009; Accepted 19 January 2010)