Pak. J. Weed Sci. Res., 18(4): 495-507, 2012

ETHNO VETERINARY MEDICINAL USES OF PLANTS OF POONCH VALLEY AZAD KASHMIR

Muhammad Azam Khan[1], Mir Ajab Khan[2] and Mazhar Hussain[1]

ABSTRACT

An ethnobotanical study on veterinary medicinal plants of Poonch valley was conducted from April 2004 to August 2005 in order to generate ethnoveterinary data in the valley. A total of 14 animal ailments were reported, of which mastitis, stomach flatulence, diarrhea, foot and mouth disease and milk deficiency were the most frequently reported diseases. Nineteen veterinary medicinal plant species including weeds that were distributed among 19 genera and 14 families were recorded. The most utilized growth forms were shrubs (7 species, 36.84%) and herbs (7 species, 36.84%), followed by trees (5 species 26.32%). Roots and leaves (6 species 31.57% each) followed by stem and seed (5 species each 26.32) were the most frequently used plant parts for ethnoveterinary medicine. Usually fresh materials were used for medicinal preparation. The most frequently used route of drug administration was oral followed by dermal. Indigenous knowledge was mostly transferred orally indicating that it was prone to fragmentation or loss.

Keywords: Ethnoveterinary, Himalayan region, medicinal plants, Poonch valley, weeds.

INTRODUCTION

Ethno-veterinary medicine (EVM) is a system that is based on folk beliefs, traditional knowledge, skills, methods and practices used for curing diseases and maintaining health of animals**.** Ethnoveterinary medicine provides the major source for the treatment of diseases in livestock throughout the world even today. Humans have used herbal remedies for curing different diseases in their domesticated animals since the advent of civilization. It is estimated that medicinal plants, for several centuries, have been widely used as a primary source of prevention and control of livestock diseases (Hoareau and Da-Silva, 1999). Traditional veterinary medicine knowledge like all other traditional knowledge systems is handed down orally from generation to generation and it may disappear because of rapid socioeconomic, environmental and technological changes and as a result of the loss of cultural heritage under the guise of civilization**.** Only solution is that it

[1]Department of Botany, Govt. Boys Degree College, Hajira Azad Kashmir, Pakistan
[2] Department of Plant Sciences, Quaid-i-Azam University, Islamabad 45320, Pakistan.
Corresponding author's email: muhammadazam87@gmail.com, mzhrhussain18@gmail.com

must be documented and conserved through systematic studies before it is lost forever. In fact, interest of such use in the veterinary sector has resulted primarily from the increasing cost of livestock maintenance and the introduction of new technology in the production of veterinary medicines and vaccines.

Despite the fact that ethnoveterinary medicine has been very crucial for the animal health care of most developing countries, it has not yet been well documented and much effort is needed in research and integration activities in these countries (Abebe and Ayehu, 1993; Mathias and McCorkle, 1997). According to the inhabitants of the area plants were used from the very past as ethnoveterinary medicines for curing many livestock diseases in the study area. This research work was therefore, conducted to document the indigenous knowledge of the local community on utilization, management and conservation status of ethnoveterinary medicinal plants in the study area.

Bhattari (1992) conducted research on veterinary medicines used by farmers in Nepal. He described 60 prescriptions involving 58 plant species with detailed information about dosage and how these are administered to livestock. He also observed that the uses of herbal remedies are much alive and functional in rural areas of Nepal.

Leeflang (1993) conducted a study on ethnoveterinary medicine in Nigeria. He discussed numerous examples of indigenous knowledge and practices that will be useful for curing diseases in animals. Sudarsanam *et al.* (1995) carried out an ethnobotanical study in Andhra Pradesh. It was reported that 106 plants were used to cure veterinary diseases. The plants are listed in alphabetical order of family, genus and species with local names, voucher specimen number, parts used, methods of application and ailments treated. Schillhorn (1997) observed traditional methods of animal parasitic disease control. According to him the value of traditional knowledge empowers local farmers to cure their herds. Lans and Brown (1998) used four stage processes to document ethnoveterinary practices in Trinidad and Tobago. They reported that 12 plant species were used to treat 4 categories of health problems common to poultry production.

Hoareau and Da-Silva (1999) observed that medicinal plants are an integral component of ethnoveterinary medicine. Farmers and pastoralists in several countries use medicinal plants in the maintenance and conservation of the Healthcare of livestock. Intestinal disorders in cows, in Mexico, are treated with herbal extracts of *Polakowskia tacacco*. Dietary supplements such as vitamin A in poultry feeds in Uganda are supplied through enrichments of Amaranth (*Amaranthus* sp.). It is estimated that medicinal plants, for several centuries, have been widely used as a primary source of prevention and control of livestock diseases. In fact, interest of such use in the

veterinary sector has resulted primarily from the increasing cost of livestock maintenance and the introduction of new technology in the production of veterinary medicines and vaccines.

Alaroa *et al.* (2002) reported that ethnoveterinary practices are common in herdsmen and village livestock bearers in northern Nigeria. They observed that the folk recipes used include plant extracts, seeds, leaves and bark of trees and tubers and roots of various plants. These are processed in various ways and administered to the animals for a variety of diseases. Ole-Midron (2003) carried an ethnoveterinary project in Kenya. According to him Maasai people rely not only on symptoms of diseases but also on vectors of diseases and season effects. The people of the area are reported to use 18 medicinal plant species for curing diseases.

MATERIAL AND METHODS

Study area

The study area is confined to the present district Sudhnoti and the adjacent parts of district Bagh of Azad Kashmir. The area is situated between 33°-36° North latitude and 73°-75° East longitude guarded by occupied Poonch district of central Kashmir in the east, Rawalpindi district in the west, Tattapani and Kotli in the south and Sudhen Gali Muzaffarabad in the north. The total area is 8500 ha. The average rainfall in the area recorded is 1600mm; the temperature fluctuates between 3°C (during winter season) to 40°C (in summer season) (Azad Kashmir Statistical Book, 1998). There is heavy snowfall during December to February (approximately upto 03 feet) which completely covers the area. The vast portion of the area is composed of sandy clay soil capable to retain moisture, helping in good growth of forest. It is followed by loamy soil recorded in 16 communities. River Poonch flows in the eastern border of the investigated area. There are many springs and small streams and gullies in the area.

Site Selection

Selection of sites was based upon the criteria of diversity (Species richness) and rarity of species (Nilsson, 1986). The selected sites represent various topographical and ecological features, such as mountains, hills and plains. The vegetation of the study area is largely influenced by monsoon rainfall and varies from humid zone to temperate zone. Before collection of the data, a general visit was made to obtain an overview of the region in order to gain familiarity with the different vegetation types, the local flora, the topography, and land use per cover pattern.

The plants of ethno-veterinary importance were collected and identified. Local people were interviewed for ethnoveterinary

information of the area. The timings for fieldwork were selected according to the growth and collection season of the plants. Population size and its distribution, history of settlement, major social groups or classes, productive activities, were also explored during the field work.

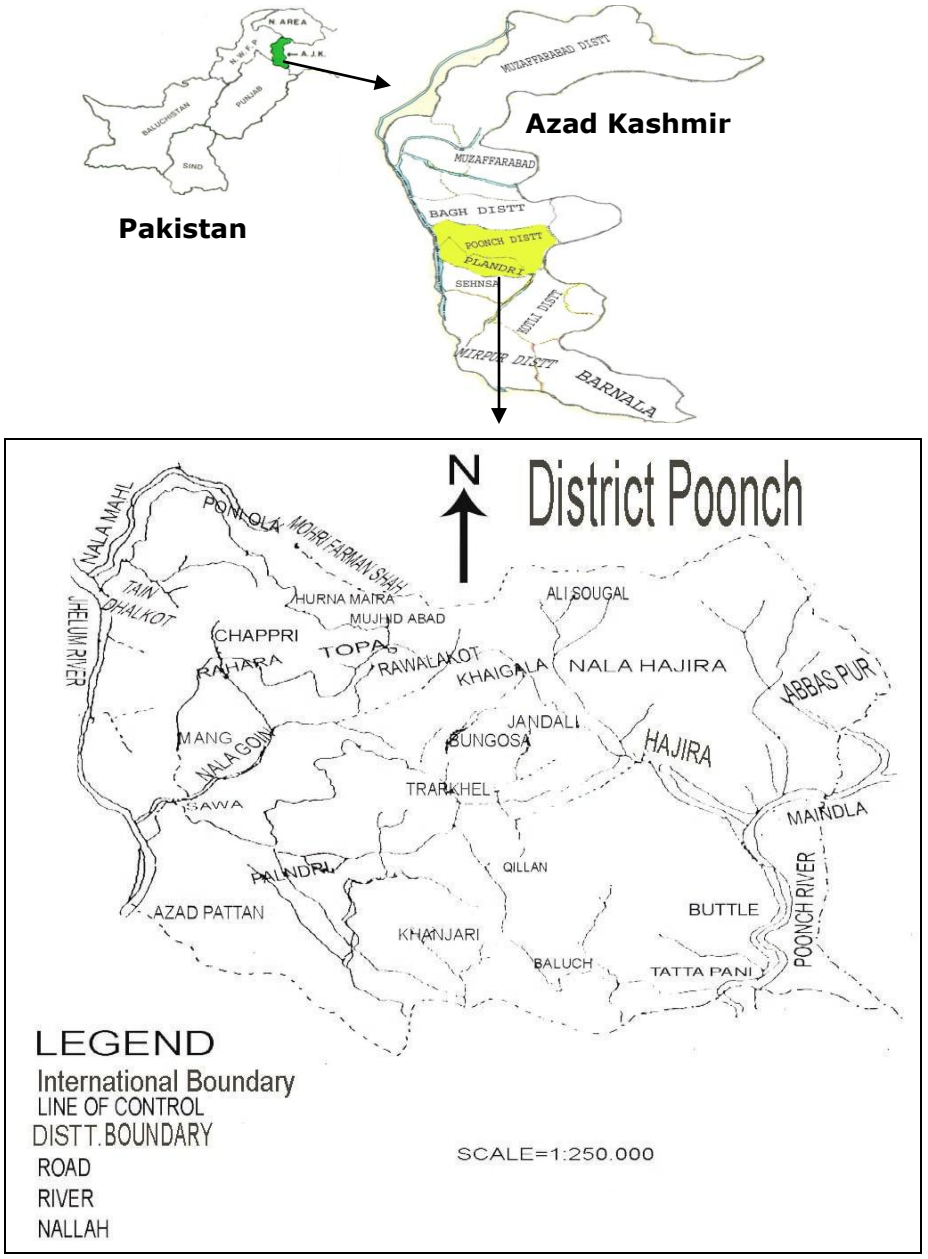

Figure 1. Map of district Poonch.

Informant selection

Local people including plant collectors and others on age group basis were interviewed for ethnoveterinary information of the area. A total of 37 (13 females and 24 males) people were interviewed and information regarding the depth of traditional knowledge was documented. The information obtained from the local people was then cross-checked and mostly similar responses from the two sexes were used to evaluate the reliability of the information recorded during the interviews.

Plant specimen collection and identification

Voucher specimens of plants were collected from the study area, allotted collection numbers, pressed and dried for identification at the Quaid-i-Azam University herbarium (ISL) and authentically identified (Stewart, 1972; 1982; Nasir and Ali, 1970-2002). The ethno-veterinary data obtained was checked and compared with the existing literature and was analyzed both quantitatively and qualitatively. The information collected was crosschecked with available literature about ethno-veterinary medicinal uses of plants (Muhammad *et al.,* 2005; Shinwari and Khan, 1999; Akhtar, 1988; Akhtar *et al.,* 2000; Akhtar and Ahmad 1992; Anonymous, 1993; Jost *et al.,* 1996; Porth, 1994; Peacock, 1996; Hammond *et al.,* 1997).

RESULTS AND DISCUSSION

Farmers and pastoralists in several countries use medicinal plants in maintenance and conservation of the livestock health care. The intestinal disorders of cows in Mexico are treated with herbal extracts of *Polakowskia tacacco* (Hoareau and Da-Silva, 1999). In fact, the interest of such use in the veterinary sector has resulted primarily from the increasing cost of livestock maintenance and the introduction of new technology in the veterinary medicines and vaccines (Hoareau and Da-Silva, 1999). The people of Poonch also depend on plant resources for curing different diseases in their livestock. Ten different plant species are known to be used by the people in the study area. A similar ethno-veterinary study by Sudarsanum *et al.* (1995) revealed that 106 plants are there to cure veterinary diseases. Similarly, Ishtiaq *et al.* (2002) reported ethnoveterinary uses of medicinal plants from Samahni valley District Bhimber Azad Kashmir. They reported that 54 plant species distributed in 31 families are used to treat various diseases of the domestic animals.

Bhattari (1992) conducted research on veterinary medicines in Nepal. He described 60 prescriptions involving 58 plant species with detailed information about dosage and how these are administered to livestock. He also observed that the uses of herbal remedies are much alive and functional in rural areas of Nepal. Leeflang (1993) conducted a study on ethnoveterinary medicine in Nigeria. He discussed numerous

examples of indigenous knowledge and practices that were useful for curing various animal diseases. Sudarsanam *et al.* (1995) used 106 plants to cure veterinary diseases. The plants are listed in alphabetical order of family, genus and species with local names, voucher specimen number, parts used, methods of application and ailments treated (Table-2).

Schillhorn (1997) observed traditional methods of animal parasitic disease control. According to him the value of traditional knowledge empowers local farmers to cure their herds. Lans and Brown (1998) used 12 plant species to treat four categories of health problems common to poultry production. Hoareau and Da-Silva (1999) observed that medicinal plants are an integral component of ethnoveterinary medicine. Farmers and pastoralists in several countries use medicinal plants in the maintenance and conservation of the healthcare of livestock. Dietary supplements such as vitamin A in poultry feeds in Uganda are supplied through enrichments of Amaranth (*Amaratithus* spp.). It is estimated that medicinal plants, for several centuries, have been widely used as a primary source of prevention and control of livestock diseases. In fact, the interest building of using medicinal plants in the veterinary sector has resulted primarily because of the increasing cost of livestock maintenance and the introduction of new technology in the production of veterinary medicines and vaccines.

Alaroa *et al.* (2002) observed in Nigeria that the folk recipes used include plant extracts, seeds, leaves and bark of trees, tubers and roots of various plants. These are processed in various ways and administered to the animals for a variety of diseases. Ole-Midron (2003) reported that Maasai people in Kenya rely not only on symptoms of diseases but also on vectors of diseases and season effects. The people of the area are reported to use 18 medicinal plant species for curing diseases.

The present study revealed that 19 plant species (11.24%) are used as veterinary medicine. Some of these species are *Aesculus indica, Arisaema flavum, Debregeasia longifolia, Mallotus philippensis, Melia azedarach, Rhamnus purpurea, Taraxacum officinale, Cedrella toona, Chenopodium album, Trichodesma indicum, Riccinus communis, Acacia modesta, Andrachne cordifolia, Euphorbia cognate, Adhatoda vesica*, *Carissa caranta, Sassuria heteromala*, *Sorghum halepense* and *Zanthoxylum alatum.*

A total of 14 animal ailments were reported by the local informants of the study area. The frequency of the most cited ailments and the number of medicinal plant species also given in Table-1. The most recurrently reported animal health problem with a frequency of report 08 was diarrhea. The local people used about 03 medicinal plants to treat this illness. An abdominal worm was the next ailment with frequency of report 05 and treated with 02 medicinal plant species. An enumeration of these plants is given in detail in Table-2 below.

Table-1. Common livestock ailments and number of medicinal plant species used to treat ailments.

Livestock disease	Frequency of report	No. of plant species used
Diarrhea	3	8
Abdominal worms	2	5
Milk deficiency	4	4
Stomach flatulence	2	4
Mastitis	3	3
Goat scabies	1	2
Chest disease of horses	1	2
Abdominal disorder	1	2
Intestinal worms and hoof rot	1	2
Foot and Mouth disease of cattle	2	2
Delivery disorder in cattle	1	1
Skin disease	2	1
Pro-lapse of uterus	3	1
Snake bite	1	1

Analysis of the growth forms of these medicinal plants revealed that shrubs as well as herbs species constituted the largest number or proportion with seven species each (36.84% of the total). The next largest growth form was represented by trees with five species (26.32) shown in Figure 2.

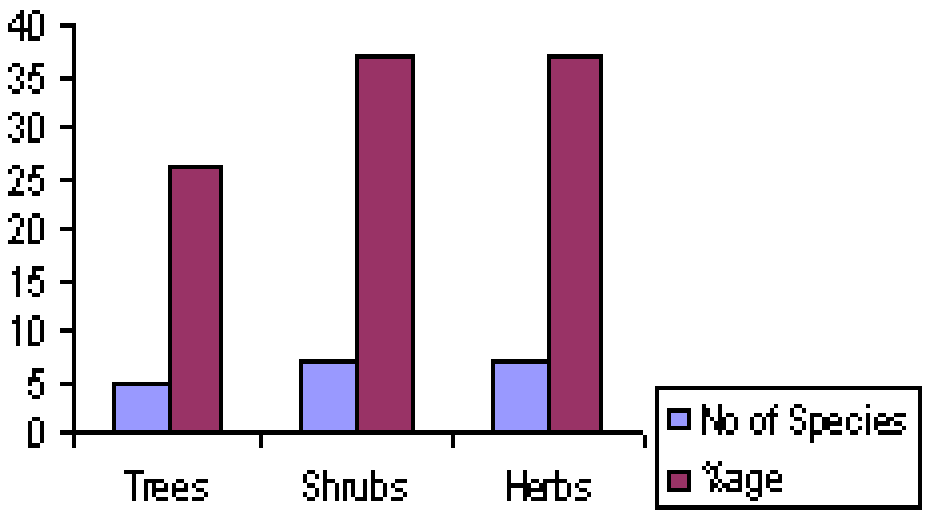

Figure 2. Percentage distribution of growth forms of medicinal plants and proportional disease.

With record for the plant part used for medicinal purposes local people mostly harvested leaves and roots (6 species each, 31.57% each) followed by seeds and stems (5 species each, 26.32% each), as given in Figure 3.

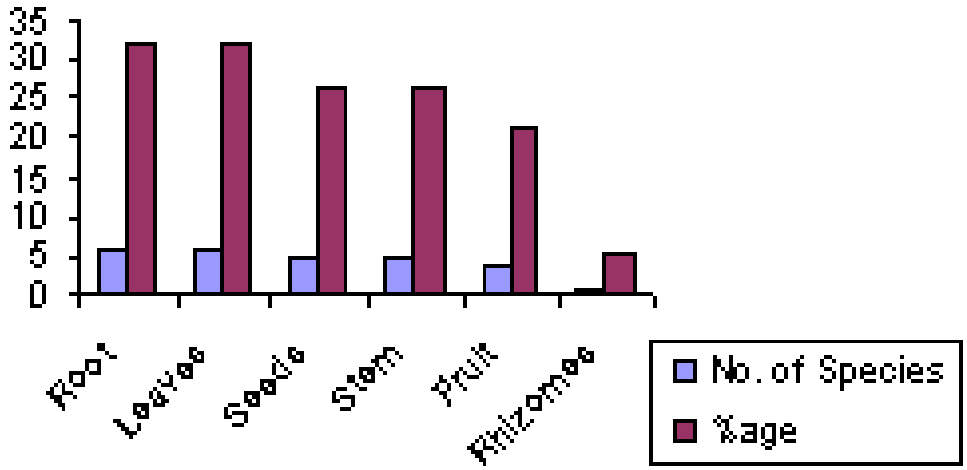

Figure 3. Percentage distribution of the plant parts used for the medicinal purposes.

Major threats to ethnoveterinary medicinal plants

Many medicinal plants in the study area were highly threatened with anthropogenic and natural factors. The majority of ethnoveterinary medicinal plants (7 species, 36.84%) were reported to be threatened with agricultural expansion. Deforestation for various purposes was the next severe threat that was responsible for the decline of about 11 medicinal plant species (57.89%) in the area. The third major factor affecting the medicinal plant species was overgrazing as given in Figure 4.

In addition, a fourth major but silent factor that affected the medicinal plants species in the study area and that was the dominance of exotic and alien plants. For authentication of this fact, similar observations were documented by Hassan *et al.* (2012). Analysis of data regarding the status of medicinal plants showed that nine (64.29%) of the medicinal plants species were abundant, two were frequent (14.28), and three (21.43 %) species were very rare.

Medicinal plant conservation efforts of the local people

About 68.42% of the informant interviewed had some kind of awareness in conserving some medicinal species that were relatively scarce in their surroundings. These informants were practicing some

conservation activities like cultivation in an around farmland of about 52.83 % of the total medicinal plant species. In situ protection of plants, control in protection of fire and cultivation of some plants as live fence were also some of the admirable activities of these people.

It was observed that majority of the local people used to collect medicinal plants with a great secrecy and no one was allowed to see except some family members during this activity. Accordingly, most people pass on their knowledge orally to an elect of their family like their husband or wife or to an intelligent son or daughter. Some people have reported that the indigenous knowledge would be passed on to the elder sons or daughters if and only if they were willing to pay for the service. However, the rest of the informants were not practicing any pronounced conservation efforts. They simply went to the field or farmland to collect medicinal plants as their need arose and did not care for the long term survival of these plants.

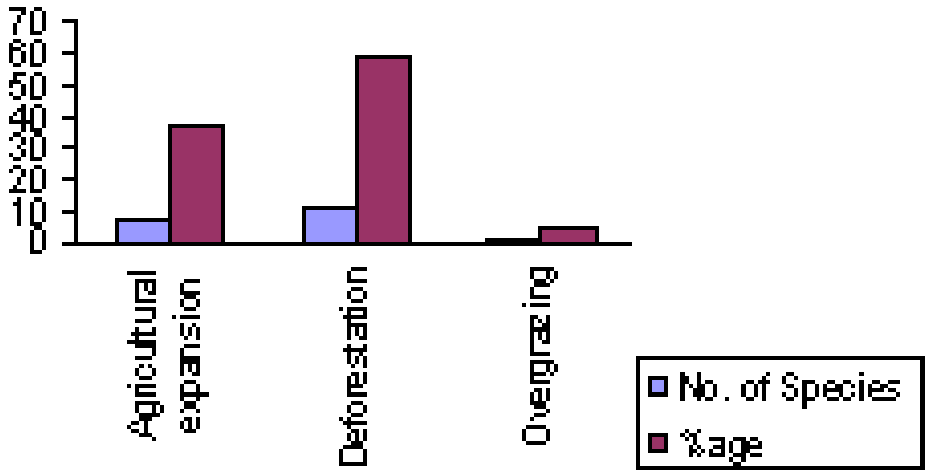

Figure 4. Percent of veterinary medicinal plants affected by the different factors.

CONCLUSION

Ethnoveterinary medicine provides the major source for the treatment of diseases in livestock throughout the world even today. Humans have used herbal remedies for curing different diseases of their domesticated animals since the advent of civilization. People of the study area effectively used 14 plants in their various forms. Very common diseases of the animals were treated with perfection and care by the participation of elder people. This folk knowledge of the area documented will help provide information for curing the veterinary diseases of other areas in future.

Table-2. Enumeration of useful ethno veterinary plants of Poonch Valley Azad Kashmir.

S. No.	Botanical name	Family	Local name	V.No	Medicinal uses	Description
1.	*Arisaema flavum* (Forssk) Schott.	Araceae	Hathbis	34	Milk deficiency	The rhizome is poisonous. The mixture of boiled rhizome and wheat flour is given to the cattles for increasing milk
2.	*Andrachne cordifolia* (Dene) Muell.	Euphorbiaceae	Karukni	23	Diarrhea	Vermifuge for cattle
3.	*Euphorbia cognata* (Kl & Grache) Boiss.	Euphorbiaceae	Dodali	157	Goats Scabies	Extract and paste of fresh stem and leaves used as an effective poultice to cure skin disease of goats
4	*Mallotus philippensis* (Lam) Muell	Euphorbiaceae	Kamilla	219	Abdominal worms	Red powder obtained from surface of the fruits is used medicinally to remove the Threadworms and Ascaris.
5	*Aesculus indica* L.	Hippocastanaceae	Bunkhor	13	Chest diseases of horses	Nuts are colic, used for cure of chest diseases of horses, donkeys, mules, and given to the cattle as stimulant.
6	*Zanthoxylum alatum* Roxb	Rutaceae	Timber	427		Abdominal disorder, seeds are used as carminative for cattle.
7	*Debregeasia salicifolia* (D.Don.) Rendle	Urticaceae	Sindari	124	Diarrhea	Leaves are given to the animals as a treatment of diarrhea and flatulence.
8	*Acacia modesta* (Wall.)	Mimosaceae	Plahi	02	Delivery.	The bark decoction is mixed disorder in with butter and fed to buffalo cattle and cow for easy delivery and release of placenta.
9	*Adhatoda vesica* Nees.	Acanthaceae	Bahkar	11	Intestinal worm	The decoction of root and leaves is given orally to hoof rot calves for elimination of intestinal worms as antihelmintic. The ash mixed with oil of sarsoon (*Brassica compestris* L. Brassicaceae) is applied to cure hoof rots and rubbed on skin as insect (Mosquitoes and flies) repellent.
10	*Carissa caranta* L.	Apocynaceae	Garanda	73	Foot and mouth diseases of cattle (Mokahar)	Its root is mixed with pericarp of mango (*Mangifera indica* L. Anacadiaceae) in water and used as wormicide of intestine. Its leaves are crushed with honey and fed to give relief of foot and mouth disease (Mokahar) of cattle.
11	*Cedrella toona* Roxb. ex. Rottle Willd	Meliaceae	Toon	75	Diarrhea, Dysenter	Its bark is mixed with methi (*Trigonella foenicum* L. Fabaceae), seeds and yogurt and given orally to cattle and sheep for chronic diarrhea and dysentery.

S. No.	Botanical name	Family	Local name	V.No	Medicinal uses	Description
12	*Chenopodium album* L	Chenopodiaceae	Ghanari	85	Skin disease	The decoction of whole plant with mokari (*Solanum surrattense* Benth. Solanaceae) is prepared and given orally to cure skin disease.
13	*Melia azedarach* Him.	Meliaceae	Dharek	224	Stomach flatulence	Seeds are crushed and mixed with milk and given to cattle to cure fever and seasonal cough and increase appetite by lessening stomach flatulence and killing worms (helmintic).
14	*Ricinus communis* Linn.	Euphorbiaceae	Harnoli	326	Prolapse of uterus	Seed oil mixed with decoction of jaman (*Cordia obliqua* Willd. Boraginaceae) leaves are given to cattle for constipation problems and increase appetite. Its leaf extract with damen (*Grewia* sp) bark fiber and fruit is frequently used for prolapse of uterus and easy delivery and to hasten release of after birth in buffalo.
15	*Sassuria heteromala* (D. Done.) Hand	Asteraceae	koth	348	Stomach flatulence	The seeds are carminative for horses and also considered cure for horse bite.
16	*Sorghum halepense* (L.) Pers.	Poaceae	Barron gass	381,	Mastitis (swollen mammary glands	Root decoction is mixed with mud of pound and pasted on teats of cattle to cure mastitis while kalar booti (*Trichodesma indica*) is hung in middle of door of cattle room and buffalo and cow pass in and out under it, it is believed that as soon as mud-paste and this plant dry, the mastitis diminishes subsequently.
17	*Trichodesma indicum* (L.) R. Br.	Boraginaceae	Kalar booti	398	Snake bite	Its root decoction is used and mastitis against snake bite poison while its leaves poultice is effective against inflammation and swellings. It is also used to cure mastitis in combination with other plant
18	*Taraxacum officinale* Webber	Asteraceae	Handd	389	Milk deficiency	The whole plant is fed to cattle and goats with leaves of Plahi (*Acacia modesta*) to increase the milk production.
19	*Rhamnus purpurea* Edgew	Rhamnaceae	Dadralu	320	Abdomina worms	Fresh fruits and leaves are given to the cattle as antihelmint

ACKNOWLEDGEMENTS

The authors are grateful to the local informants of the study area for their contribution and sharing their precious indigenous knowledge.

REFERENCES CITED

Akhtar, M.S. and I. Ahmad. 1992. Comparative afficacy of *Mallotus philippinensis* fruit (Kamala) or Nilzan drug against gastrointestinal cestodes in Beetal goats**.** Small Ruminants Res. 8: 121-128.

Akhtar, M. S. 1988. Anthelmintic evaluation of indigenous plants for veterinary usage. Final Research Report (1983-88). University of Agriculture Faisalabad, Pakistan.

Akhtar, M.S., M.N. Z.I. Khan and M. Latif. 2000. Anthelmintic activity of medicinal plants with particular reference to their use in animals in Indo-Pakistan subcontinents. Small Ruminants Res. 38: 99-107.

Alaroa, J.P., G.E. Jokthan and K. Akut. 2002. Ethnoveterinary medical practice for ruminants in the subhumid Zone of northern Nigeria. Prev. Vet. Med. 54(1): 79-90.

Anonymous. 1993. Garlic as an antihelmintic. Vet. Rec. 65: 636 p.

Bhattari, N.K. 1992. Folk use of plants in veterinary medicines in central Nepal. Fitoterapia. 63(6): 497-506.

Abebe, D. and A. Ayehu, 1993. Medicinal Plants and Health Practices of Northern Ethiopia. B. S. P. E., Addis Ababa, 511 p.

Azad Kashmir Statistical Book. 1998. Planning and Development Department Azad Government of Jammu & Kashmir.

Hassan, G., K.B. Marwat, S. Ali, M. Munir and P. Khaliq. 2012. *Parthenium hysterophorus* L. - A predominant weed flora among phytosociology of Islamabad, Pakistan. Pak. J. Weed Sci. Res. 18(2): 149-156.

Hammond, J.A., D. Fielding and S.C. Bishop. 1997. Prospects for plant anthelmintics in tropical veterinary medicine. Vet. Res. Commun. 21: 213-228.

Hoareau, L. and E.J. Da-Silva. 1999. Medicinal plants: A re-emerging health aid. Elect. J. Biotechnol. Vol 2.

Jost, C.C., D.M. Shermam, E.F. Thomson and R.M. Hesselton. 1996. Kamala (*Mallotus philippinensis*) fruit is ineffective as an antihelmintic against gastrointestinal nematodes in goats indigenous to Balochistan, Pakistan. Small Ruminant Res. 20: 147-153.

Lans, C. and G. Brown. 1998. Observations on ethnoveterinary medicines in Trinidad and Tobago. J. Prev. Vet. Med. 35(2): 125-142.

Leeflang, P. 1993. Some observations on ethnoveterinary medicine in Northern Nigeria.

Mathias, E. and C.M. McCorkle. 1997. Animal health. *In*: J. Bunders, B. Haverkort, W. Hiemstra. 'Biotechnology: Building on Farmers' Knowledge. MacMillan Education Publishing, Basingstoke, UK, pp. 22-51.

McCorkle, C., 1986. An introduction to ethnoveterinary research and development. J. Epidemiol, 6: 129-149.

Muhammad, G., M.Z. Khan, M.H. Hussain, M. Iqbal and M.J. Athar. 2005. Athnopharmacol., 97: 241-246.

Nasir, E. and S.I. Ali. 1970-2002. Flora of West Pakistan. National Herbarium, NARC, Islamabad. University of Karachi, Karachi, Fasc. No. 1-207.

Nilsson,C. 1986. Methods of selecting lake shorelines as nature reserve. Biol. Conserv. 35: 269-91.

Ole-Midron, J.O. 2003. The Maasai ethnodiagnostic skill of livestock diseases; A road to traditional bio prospecting. J. Ethnopharmacol. 84(1): 79-83.

Peacock, C. 1996. Improving Goat Production in the Tropics-A Manual for Development Workers. Oxfam, 274 Banbury Road, Oxford OX2 7DZ.

Porth, C.M. 1994. Pathophysiology concept of altered health states. 4th Ed., J.B. Lippincott Company, Philadelphia, USA.

Schillhorn, V.V. 1997. Traditional methods of animal parasitic diseases control. J. Vet. Parasitol. 71 (2): 177-194.

Shinwari, M.I. and M.A. Khan. 1999. Ethnobotanical conservation status of Margalla Hills National Park, Islamabad. J. Plant Resour. Environ. 8: 53-60.

Stewart, R.A. 1972. An annotated catalogue of the vascular plants of West Pakistan and Kashmir. *In*: Nasir E. and S.I. Ali (Eds.) Flora of West Pakistan, University of Karachi, Pakistan.

Stewart, R.R. 1982. History and Exploration of plants in Pakistan and adjoining areas. National Herbarium, NARC, Islamabad, Pakistan.

Sudarsanum, G., M.B. Reddy and N. Nagaraju. 1995. Veterinary crude drugs in Rayalaseema, Andhra Pradesh, India. Int. J. Pharm. 33(1): 52-60.