

## PLANT RESOURCE UTILIZATION IN THE ETHNOVETERINARY PRACTICES BY THE GUJJAR AND BAKERWAL TRIBES OF JAMMU AND KASHMIR STATE, INDIA

ABDUL RASHID\*, V. K. ANAND and ASHRAF HUSSAIN SHAH

Department of Botany, University of Jammu, Jammu – 180006, India.

\*E-mail : rishi4282@yahoo.co.in

Jammu and Kashmir is one of the thirteen mountainous states of India, occupying the most prominent position in the North-Western Himalayas. The diverse climatic and topographic conditions has bestowed upon the region with a rich repository of flora and fauna. Nomadic tribes and pastoral communities particularly Gujjars and Bakerwals dwelling in Jammu and Kashmir State are reputed to have mastered the traditional practices and knowledge about the plants used to cure the various diseases of their livestock. Ethnomedicinal exploration carried out during the past two years (2004-2006) have brought to light forty-seven plant species being widely used to treat various diseases of livestock in this region. Exploration revealed that out of forty-seven plant species some plants have been used for improving the fertility, vigor and increasing milk yield. The present paper is based on the ethnomedicinal information accrued from Gujjar and Bakerwal tribe with respect to plants used in ethnoveterinary practices. Also the botanical identity, local name, specific preparations and mode of administration are discussed.

**Keywords:** Bakerwals; Ethnoveterinary; Gujjars; Livestock; Pir-Panjal.

### Introduction

Ethnoveterinary medicines are used extensively and quite effectively for primary health care treatment and maintaining animals productive. The knowledge is passed on verbally from generation to generation. Over centuries people have developed their own ways of keeping animals healthy and productive using age-old home remedies, surgical and manipulative techniques, husbandry strategies and associated magico-religious practices<sup>1</sup>. The indigenous phytotherapy of Indian tribes can provide useful alternative to conventional animal health care<sup>2</sup>.

The Himalayan state of Jammu and Kashmir has predominantly a livestock based economy. The State is largely a mountainous track inhabited by many nomadic tribes and pastoral communities including Gujjars, Bakerwals, Ghadis and Sipis.

Maintenance of livestock health in this region has been possible because of some traditionally proven ethnoveterinary practices. Though there is no authentic evidence of when and how plants come into usage for curing the livestock, the Gujjars and Bakerwals seems to be aware of these practices through generations<sup>3</sup>. General observations and studies show that these tribal are using several ethnoveterinary plants and practices for curing various diseases. The tribal and pastoral communities of Jammu and Kashmir State fed their livestock (which include buffaloes, cows, goats, horses, and sheep) in the upper reaches of mountainous terrains, where they do not

have access to the modern veterinary medicines. They depend solely on folk medicine and herbal remedies. Traditional indigenous phytotherapy is still practised in most of the cases for livestock, using strictly guarded treatment handed over from generation to generation.

Little information has been documented on these aspects from Jammu and Kashmir state. Sharma and Singh<sup>4</sup>, Showket *et al.*<sup>5</sup>, Farooque<sup>6</sup> and Singh and Kushal<sup>7</sup> are the only references from Jammu and Kashmir state on the similar lines. All these previous studies are related either to the Central Himalayas or Kashmir Himalayas. Gujjars and Bakerwals, the dominant tribes living in Pir-Panjal Himalayas and Shivalik hills are not covered properly under any of the earlier studies. Keeping in view the socio-economic importance of livestock rearing in this region, fast vanishing of indigenous traditional knowledge of plants and to cover the unexplored areas this study was undertaken. The present study will bridge the gap and will provide the database for future studies on the various aspects of reported plants.

### Materials and Methods

Periodic field trips for ethnobotanical exploration were undertaken during September, 2004 to April, 2006 in rural and mountainous areas of Jammu and Kashmir state inhabited by Gujjars and Bakerwals. During the surveys personal interviews were conducted with knowledgeable persons within two ethnic groups (Gujjars and Bakerwals) to know about the plants used and practices for curing

livestock ailments. To verify and confirm claims, the interview questionnaires were repeated within and among interviewees. Each of the plant material was assigned a field book number and documented as to scientific name, local name, family, part used, method of use, folk claims and mode of administration. The local names of different livestock diseases, where available were converted into scientific names by taking the help of veterinary doctors. Plant parts that were identified as having use in ethnoveterinary were collected, compressed, the Herbarium specimen were made and submitted to the Jammu University Herbarium. Plant specimens were identified using related literature<sup>8-10</sup> as standard references. Wherever necessary, comparisons were made with Herbarium specimens available at Jammu University Herbarium.

### Results and Discussion

During the course of study forty-seven plant species belonging to twenty-eight families were found to be widely used by the Gujjar and Bakerwal tribe in different ways against various livestock ailments. Liliaceae and Solanaceae are the most frequently encountered botanical families, with four members each being used in ethnoveterinary practices, followed by Polygonaceae with three species. All other families are represented by two or a single member. The treatment which covers a variety of livestock ailments, were generally easy to prepare, frequently involving only the feeding of specific part of the selected plant to the animal being treated. A few plants have more than one use, but most were restricted to use on a particular affliction. Diarrhoea, colic, black-quarter and red-water are the most common veterinary diseases. *Gentiana phyllocalyx*, *Rumex acetosa*, *Aesculus indica* and *Verbascum thapsus* are the common plants to treat diarrhoea and colic. Also the dried fine powder of three gymnospermic taxa namely *Juniperus recurva*, *Pinus roxburghii* and *Pinus wallichiana* is applied on the cattle wounds for quick and better healing. The details regarding medicinal use, part used, scientific names, local names, method of administration and preparation, disorder / ailment treated is given in Table 1. Most prevalent ailments of this region along with plant use to treat them are given in Table 2.

Ethnoveterinary medicine refers to people's indigenous knowledge and approaches to the animal healthcare. Plant based ethnoveterinary medicine and practices are making an important contribution in improving the veterinary infrastructure and increasing the livestock productivity in the region. Enhanced efforts are needed to facilitate the integration of plant based Ethnoveterinary medicine and practices with modern operations for sustainable utilization of plant resources and perseverance of indigenous traditional knowledge.

Gujjars and Bakerwals are the nomadic tribe of Jammu and Kashmir state. They keep on moving from place to place, with their livestock in search of fodder and forage. In summer they migrate from the plains of Jammu

region to the Pir-Panjal ranges of North-Western Himalayas and upper reaches of Shivalik hills. With the onset of winter, they come back to the plains of Jammu region, mainly in districts, Rajouri, Poonch, Udhampur and Kathua. An interesting feature of this migration is that these nomads take more than three months to cover a distance of 180 kms. from Jammu plains to the higher reaches. Most of them do not have any permanent settlements. Their livelihood solely depends on their herd wealth. Veterinary diseases are a perennial problem to these nomadic tribes. Sheep, goat, buffalo, cow and horse are the main livestock components reared by Gujjars and Bakerwals. Beside these, they also rear poultry, dogs and cats.

Gujjars and Bakerwals have not been yet the subject of any noteworthy anthropological or socioeconomic investigation. In general, the ethnoveterinary practices of these tribal have been largely overlooked and a recognition of their valuable contribution to the livestock healthcare delivery system ignored. Indigenous phytotherapy is being extensively and quite effectively used by the Gujjars and Bakerwals for primary healthcare treatment of their livestock. Study revealed that inaccessibility, high cost, lower success rate, magico-religious beliefs and other problems like side effects associated with conventional veterinary medicine have encouraged constant dependence on such traditional rural wisdom. For Gujjar and Bakerwal of the study area, plant based ethnoveterinary practices are cheaper, accessible, considered safe, time tested and based on local resources and strength. Elders and women folk are the main source of knowledge of herbal remedies, to treat various ailments of domestic animals. They collect the specific plant from surroundings or forest and guide others for further processing, which often include drying, powdering and storage for future use or direct use in their combination or singly.

Prevention, control and eradication of diseases among the livestock are major concern, as diseases in animals lead to economic losses and possible transmission of the causative agents to human beings. It is estimated that \$ 50 million are annually lost on account of the livestock diseases in India. Plant based ethnoveterinary practices, recorded during the present study can provide useful alternatives to conventional healthcare system.

Gujjars and Bakerwals have developed indigenous traditional knowledge about the plant resource utilization through the experience of their social groupings embedded in specific localities, profession and cultural contexts and can be developed, validated and disseminated to provide sustainable rural livelihood to these tribal and others in the country. A critical analysis of the study reveal that most of the plant based ethnoveterinary practices applied by these tribal people have enough potential to cure the various diseases, while few others are based on the superstition and mythological religious faiths or there is hardly any basis to be considered as effective treatments, but even then these practices are worthy to validate. For

**Table 1.** The details regarding medicinal use, part used, scientific names, local names, method of administration and preparation, disorder /ailment treated.

Scientific name	Family	Local Name	Part used	Ailment treated	Method of preparation/ Administration
<i>Aesculus indica</i> (Colebr ex Camp.) Hook.	Hippocastanaceae	Guen	Fruits	Loose motion colic	Crushed fruits are given either with gur (sugar) or with salt to cure loose motion. Fruits are also reported to cure pneumonia (locally known as "sule") and colic.
<i>Allium</i> <i>atropupurreum</i> waldst. And Kit.	Liliaceae	Wan- pran	Bulb	Anorexia in cattle	Mixed plant tissue and yeast and feed to livestock.
<i>Allium cepa</i> Linn	Liliaceae	Jugli piaz	Bulb	Laziness	The bulbs are fed to the cattle.
<i>Allium sativum</i> Linn.	Liliaceae	Lehsn	Bulb and young leaves	Easy onset of hot period	Crushed bulbs and shoots are given to the cattle.
<i>Amaranthus viridis</i> Linn	Amaranthaceae	Cheri, Ghnar	Seeds	Dizziness in calves.	Crushed seeds mixed with wheat flour in milk or water is given to the young calves.
<i>Amaranthus caudatus</i> Linn	Amaranthaceae	Ghnar	Seeds	Cold effect	Crushed seeds mixed with wheat flour in warm water is fed to the cattle.
<i>Artemisa absinthium</i> Linn	Asteraceae	Bhurzale	Aral parts	To increase appetite	Mixed with food and fed to animals.
<i>Asparagus racemosus</i> willd.	Liliaceae	Shahquaqual	Roots	Kidney and liver disorders	Crushed roots are given to livestock mixed with normal feed.
<i>Baliospermum montanum</i> (wild) Murli-Arg.	Euphorbiaceae	Daenten	Roots	To cure constipation	Chopped root extract is given as laxative to cure constipation cattle.
<i>Berberis lycium</i> Royle	Berberidaceae	Simblu	Leaves and roots	Wound healing	Leaves crushed and mixed with human saliva are applied on the wounds to heal up.
<i>Bergenia ciliata</i> (Haw.) Sternb.	Saxifragaceae	Sapdatry	Roots	General weakness	Pieces of root fresh or dried mixed with wheat or maize bread is given to the livestock
<i>Boerhavia diffusa</i> Linn.	Nyctaginaceae	Itsit	Roots	Black quarter	Crushed roots with wheat bread are given to buffaloes to cure black quarter.
<i>Calotropis procera</i> (Alt.)	Asclepiadaceae	Desi-ak	Roots	To treat pyrexia	Crushed roots are packed in half

R.Br.						cooked wheat bread and given to treat pyrexia. Mixed in honey and mixture is fed to animals.
<i>Crocus sativus</i> Linn.	Iridaceae	Zaffaran safran	Flower	Fever in cattle's		
<i>Cynanchum arnottianum</i> wight. Contrib.	Asclepiadaceae	Mehren	Leaves	To avoid infection		Leaf powder is spread on the wounds.
<i>Delphinium Roylei</i> Munz. milk	Ranunculaceae	Moori	Roots	Liver infections		Fine powder of roots along with butter is given to the cattle.
<i>Desmodium tiliacifolium</i> G. Don.	Sapindaceae	Mothanag	Roots loss	Loss of appetite		Roots are fed to livestock to restore normal appetite.
<i>Dodonaea viscosa</i> (L.) Jacq.	Sapindaceae	Saentha	Leaves	To kill the intestinal worms		The water extract of leaves is use to kill intestinal worms.
<i>Ficus palmata</i> Forssk.	Fagaceae	Kamari	Bark	Bandage on the wounds		Lather bark of the plant is used to tie the wounds and broken joints for better healing.
<i>Ficus auriculata</i> Lour.	Fagaceae	Thubar	Leaves and fruits	To increase milk yield		Leaves and fruits are fed to the cattle for better milk yield.
<i>Gentiana phyllocalyx</i> clarke.	Gentianaceae	Phangre	Whole plant	Loose motion		All parts are used against stomach disorders.
<i>Gerbera gossypina</i> (Royle) Beauv.	Asteraceae		Roots	To cure tonsillitis		Roots crushed mixed with butter is applied on the wound.
<i>Girardiana diversifolia</i> (Link) Fries.	Urticaceae	Sadhar	Root	Red water diseases		Crushed roots are made into small balls and given to animals.
<i>Hyoxyamos niger</i> Linn.	Solanaceae	Bazar bhang	Leaf	Toxic effects		Leaves decoction is given to the livestock.
<i>Iris kashmiriana</i> Baker.	Iridaceae	Mazarmond	Bulb and young leaves	Hepatic disorders		Bulbs and young leaves are fed to the animals.
<i>Litsea chinensis</i> Lamk.	Lauraceae	Rehen	Stem bark and root	Dislocate joints		Stem bark and roots are used as curer for dislocated joints.
<i>Malva neglecta</i> Linn.	Malvaceae	Sonchal;	Whole plant	Poor Milk Yield		Cattle are fed on the plant for better milk yield.
<i>Malva Sylvester</i> Linn.	Malvaceae	Sai Sonchal;	Whole plant	Poor Milk Yield		Cattle are fed on the plant for better milk yield.
<i>Nepeta cateria</i> Linn.	Lamiaceae	Gondhsoi	Leaves	Dysentery		Decoction of leaves is given to animals.
<i>Nicotiana tabacum</i> Linn.	Solanaceae	Tambaku	Leaf	Myiasis and wounds		Crushed leaves with lime water are given to animals.

<i>Nymphoides peltatum</i> Kuntze. (Gmel.)	Menyanthaceae	Khuar	Whole plant	Poor milk production	Plant mixed with normal feed is given to cows for better milk yield.
<i>Oxalis corniculata</i> Linn.	Oxalidaceae	Shoti-ami	Whole plant	Skin disorders	Plant extract is given with butter milk to treat skin diseases such as scabies, lesions and warts.
<i>Picrorhiza kurrooa</i> Royle ex Benth.	Scrophulariaceae	Chobikhor	Roots	Debility in horses	Root extract is given to the horses for curing general debility.
<i>Podophyllum hexandrum</i> Royle	Podophyllaceae	Bankakri	Root and rhizome	Tumorous growth	Squash and extract is applied on warts and tumors in animals.
<i>Polygonum alpinum</i> All. (Meissn)	Polygonaceae	Tsok ladar	Aerial parts	Dysentery	Crushed aerial parts are mixed with maize flour and given to cattle.
<i>Polygonum hydropiper</i> Linn.	Polygonaceae	Pipla	Leaf	Tongue infection	Chopped leaves are applied to avoid tongue infections.
<i>Populus nigra</i> Linn.	Salicaceae	Phras	Seed hairs	Cut and wounds	Seed hairs are applied on cuts and wounds particularly in sheep.
<i>Punica granatum</i> Linn.	Punicaceae	Nardana	Fruit irnd	Dysentery	Dry and powdered exocarp mixed with sugar and salt is fed to the cattle.
<i>Ranunculus hirtellus</i> Royle.	Ranunculaceae	Mangool	Ariel parts	Effects of heat	Animals are fed on the aerial plants parts.
<i>Rumex acetosa</i> Linn.	Polygonaceae	Hulla	Roots	Losse motions	Crushed roots mixed with wheat flour given to the cattle.
<i>Solanum melongena</i> Linn.	Solanaceae	Wangun	Roots and fruits	Anorexia in Buffaloes	Barbeque is given to the livestock.
<i>Solanum nigrum</i> Linn.	Solanaceae	Kach Mach	Whole plants	Liver disorders	Crushed plants mixed with butter and salt is fed to the cattle.
<i>Thymus serpyllum</i> Linn.	Labiatae	Javend marchery	Seed	To generate heat	Seeds are given with gur (sugar) to generate heat in the winters.
<i>Verbascum thapsus</i> Linn.	Scrophularaceae	Gidar tambaku	Ariel parts	Pyrexia	Crushed aerial parts are used to treat pyrexia and loose motion.
<i>Viburnum foetans</i> Decne.	Caprifoliaceae	Kulanch	Leaves	Laziness in cattles	Leaves and young twigs are fed to the cattles.
<i>Viburnum grandiflorum</i> wall ex. Dc	Caprifoliaceae	Kuch	Roots	To heal the wounds	Plant charcoal mixed with mustered oil is applied on the wounds.

**Table 2.** Common livestock diseases and the plants used to treat them.

Diseases/ailment	Local name	Plants used
Black quarter	Bakhe-ali bemare	<i>Boerhavia diffusa</i>
Colic	Gant-lagna	<i>Aesculus indica</i>
Constipation	Kavez	<i>Baliospermum montanum</i>
Debility (Physical weakness)	Kamjore	<i>Bergenia ciliata</i> ,
Diarrhoea (Loose-motin)	Julab	<i>Aesculus indica</i> , <i>Gentiana phyllocalyx</i> , <i>Rumex acetosa</i> , <i>Verbascum thapsus</i>
Dislocation of the joints	Jore-tutena	<i>Listsea chinensis</i>
Intestinal parasites	Piat keray	<i>Dodanaea viscosa</i>
Liver infection	Gigor rog	<i>Delphinium roylei</i>
Pneumonia	Sule	<i>Aesculus indica</i>
Pyrexia	Takku	<i>Calotropis procera</i> , <i>Verbascum thapsus</i>
Red-water	Luntra	<i>Girardinia diversifolia</i> <i>Viburnum grandiflorum</i>
Scabies	Karkara	<i>Oxalis corniculata</i>
Tongue infection	Moumpaka	<i>Polygonum hydropiper</i>
Tonsillities	Kangru	<i>Gerbera gossypina</i>

the purpose of scientific evaluation, modification and optimization of the plant based ethnoveterinary practices there is strong need to develop an approach, which can effectively short the voluminous practices saving the time, energy and resources. An interesting aspect of the study is that the knowledge base slightly differs among and within the Gujjar and Bakerwal tribes. It has been developed through trial and error and deliberate experimentation therefore it is less systematic, less formalized and not universally or even regionally recognized as a valid method of disease control. However, tribal people attribute health, vigor, vitality, longevity and better milk yield of their animals to the consumption of reported plant resource based ethnoveterinary practices. There has been no documentation of these indigenous practices, rather it has been transmitted across generations by an oral tradition and therefore is in danger of extinction. There is a growing acceptance that most of these practices have therapeutic value and should be documented before this knowledge is lost.

#### Acknowledgement

Authors are thankful to the Head, Department of Botany for providing the necessary facilities to carry out this work, to Dr. Mrs. Krishna Anand, Curator Herbarium, University of Jammu. Also the contribution of Dr. Nisar Ali from Animal Husbandry Division, Jammu, in providing the scientific names of veterinary diseases is gratefully acknowledged. Thanks are also due to Ms Anju Singh for suggestions and technical help.

#### References

1. McCorkle C M 1995, Back to the future: lesson from Ethnoveterinary R D and E for studying and

applying local knowledge, *Agriculture and Human value* 12(2) 52-80.

2. Kumar D 2002, The use and relevance of Ethnoveterinary Practices in Sheep. *Indian J. Small Ruminants* 8(2) 124-128.
3. Pardeep K and Anju S 1990, Ethnoveterinary practices in the country. *J. Oriental Sci.* 3(4) 207.
4. Sharma P K and Singh V 1989, Ethnobotanical Studies on North-Western and Trans Himalaya: V. Ethnoveterinary, Medicinal plants used in Jammu and Kashmir State. *J. Ethnopharmacology* 27 63-70.
5. Showket Y, Nawchoo I and Iqbal M 2003, Traditional Veterinary Medicine among the Tribals of Kashmir Himalaya. *J. Herbs, Species and Medicinal Plants* 10 (4) 121-127.
6. Farooque N A 2000, Indigenous Ethnoveterinary Knowledge and Livestock Management in Transhuman Postoralists of Central Himalayas. *J. Human Ecol.* 11 319-322.
7. Singh K K and Kaushal K 2000, Observation on Ethnoveterinary Medicine among the Ghadi Tribe of Kangra valley in Himachal Pradesh. *Ethnobotany* 120, 42-44. (Eds.) Jain S.K, Deep publications New Delhi.
8. Hooker J D 1872-1977, *Flora of British India* 1-7, L. Reeve and Co, London.
9. Strerwart R R 1972, An annotated Catalogue of Vascular Plants of West Pakistan and Kashmir 104-292, Fakhri Press Karachi, Pakistan.
10. Swami A and Gupta B 1998, *Flora of Udhampur district*, Bishen Singh Mohinder Pal. 23, A/New Cnaught Palace, Dehradun.