



Use of ethnoveterinary practices among transhumant/pastoral farmers in hilly areas of Jammu and Kashmir, India

Azad, MS¹; Choudhary, SI²; Kour, K¹; Upadhyay, L¹

¹SKUAST-Jammu

²Secretary Tribal Affairs Jammu and Kashmir

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Introduction

Transhumance is a unique phenomenon of seasonal migration of families along with livestock, mostly to higher altitude in summers and returning to the lower plains in the winter. The vertical migration follows the climatic pattern suitable for growth of livestock and is driven by the availability of sufficient grasslands or rangelands (Photograph 1). Jammu and Kashmir has a large transhumant population (0.6 million people) which is more than the total population of countries like Maldives, Iceland, Luxemburg, Brunei and many more. The livestock economy is the backbone of transhumant families, in fact the only mode of sustenance. The entire socio-cultural-economic model of transhumance revolves around the core of livestock rearing, mainly goat/sheep husbandry and dairying. Traditional and household ethnoveterinary treatment is prevalent in these hilly areas and forms the first line of defence for treatment of livestock (Ishtiyak & Hussain 2017, Tali et al. 2019, Mir et al. 2022). Herbal and plant-based ethnoveterinary medications form the major part of livestock treatment in these areas (Sharma et al. 1989). These traditional herbal remedies are cost effective, easily available and less technical, which makes them more popular than Western medications. The reliance on ethnoveterinary medication among the tribal population of Reasi and Udhampur Districts inspired the current study with following main goals:

- 1) To identify and document the different traditional plant-based treatments used by tribal people
- 2) To document the type of diseases being treated with these plants and their byproducts
- 3) To investigate the level of trust by tribal people in these traditional remedies.



Photograph 1: Transhumant migration in search of grassland

Methods

The main study areas were the remote villages of Reasi and Udhampur Districts of Jammu and Kashmir with a high density of tribal/transhumant population, mainly Gujjar and Bakarwal. Reasi and Udhampur are predominantly hilly districts with variable climatic conditions, ranging from subtropical to semi-temperate. These districts mainly can be divided into ‘hilly’ and ‘low-lying hilly’ areas. They have dense forest areas that host a diverse group of medicinal and herbal plants used for many health treatments in both humans and animals. Crops and livestock are the major sources of livelihood for these communities, who often move with their livestock to different parts for grazing. The data were collected by means of questionnaires from respondents in eight villages in each of the two districts surveyed. Interviews and discussions were the main methods for collecting information based on the questions in the questionnaire. Information was collected from especially renowned, knowledgeable people, sarpanches, progressive livestock farmers and elderly persons. A total of 64 informants, mainly residing in these hilly areas, were interviewed in the local language. They ranged in age from 37 to 78 years and were interviewed separately to obtain accurate information. Data were collected on the major livestock species in the area, size of flock/farm, major diseases, herbal and other treatments used, major plants/trees used, parts of plant used, plant byproducts used, technique to prepare the herbal medicine, application procedure, time and duration of treatment, recovery time and cost of treatment. The information obtained in the field was crosschecked with the literature available.

Results and discussion

Due to the rough terrain and poor transport facilities, local people consider ethnoveterinary remedies for livestock treatment to be most important in these hilly areas: 23 different ailments of livestock and their traditional treatments were identified and documented. The details of common ethnoveterinary remedies used along with the herb name, family name, local name, plant part used, mode of administration, disease condition, dose and recovery time are given in Table 1. Leaves (30%) were the most used, followed by whole plant and seeds (Fig. 1). The study showed a dependence of more than 70% tribal population on ethnoveterinary and herbal medication, whereas only 30% depended on allopathic or Western medication. A local veterinary doctor was consulted mostly in cases of complex disease conditions, surgery, dystocia or accidents. It was observed that traditional knowledge of herbal and local medicine still forms the first line of defence for treating livestock diseases. Milk, jaggery, butter, wheat flour and curd were the major vehicles used for administering medicines. Similar vehicles for administration were reported by Dilshad et al. (2009). These remedies were administered mostly orally and, in some cases, topically. The amount and doses were reported differently by all the respondents, indicating that there were no clear-cut standards for doses of these remedies. Also duration of treatment and response to treatment were not uniform, with different respondents reporting different treatment time and recovery time. Leaves, roots, fruit, flower, bulbs, seeds and stems were the commonly used parts of plants. Similar findings were reported by Abbas et al. (2002), Giday et al. (2003), Nfi et al. (2001), Ole-Miaron (2003) and Viegi et al. (2003).

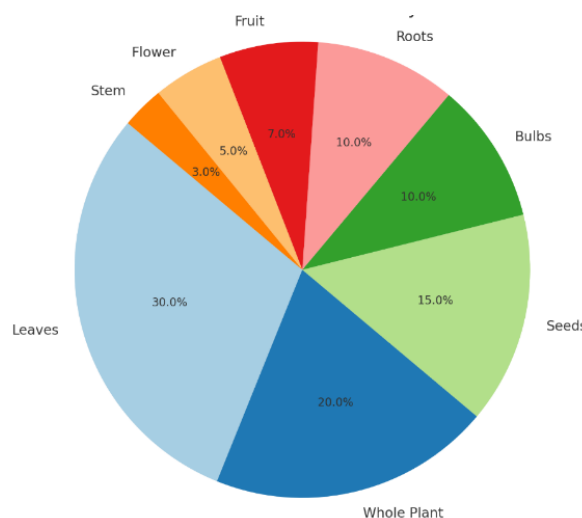


Fig. 1: Plant parts used

Farm size. Herd size varied from 2 to 200 animals. Large herds were mostly of sheep and goats. The most common ailments reported by the respondents in large farms/herds were indigestion, fever, stomach ache and allergy. In the case of cattle, most of the remedies were for bloat and tympany. Farmers with large herds preferred veterinary advice on a regular basis whereas farmers with smaller herds depended more on ethnoveterinary and homemade remedies. Farmers were also reluctant to take their livestock to a veterinary hospital and preferred the visit of a veterinarian to their farm.

Most common problems. The most common problems reported by livestock owners in these areas were bloat, tympany, indigestion, anorexia, diarrhoea, ecto-/endoparasites infection, fever, cough and allergy. Bloat, indigestion and fever were mostly treated using these local remedies. In case of ecto- and endo-parasitic infections, tribal farmers reported the use of antimicrobial drugs due to multiple parasitic infections and high resistance to other drugs and treatments. In the case of some surgical conditions like medial patellar desmotomy (MPD) or traumatic reticuloperitonitis (TRP), farmers depend on veterinary experts and did not rely on herbal remedies or local treatment. Similar treatments have been reported by Ishtiyak and Hussain (2017), Riyaz and Ignacimuthu (2023) and Tali et al. (2019) for treatment of indigestion, tympany and ecto- and endo-parasites.

Common remedies. The most common plants and plant byproducts used were *Trachyspermum ammi*, *Curcuma longa*, *Morus nigra*, *Aloe vera* (L.) Burm.f., *Trigonella foenumgraecum*, *Cannabis sativa*, *D.wrightii*, *Azadirachta indica*, *Thymus vulgaris* L., *Bambusabambos* (L.) Voss, *Allium cepa* L. Some of the plants were used for multiple treatments like pain, fever, indigestion, bloat etc. The most common plant families reported by respondents were *Apiaceae* and *Amaryllidaceae*. A few plants like *Allium sativum* L., *Allium cepa* L., *Trachyspermum ammi* and *Curcuma longa* were reported by 90% of respondents, indicating the trust and effectiveness of the ethnoveterinary practices used by tribal farmers. These remedies were used in treatment of multiple problems. Paste, crushed seeds and boiled leaves were the most preferred medicinal form used for administration. Similar results were reported by Dutta et al. (2022) and Khateeb et al. (2015). It was also observed that tribal people mostly trusted the easily available local household spices and herbs for treatment purposes.

Administration mode. Different methods of administration were used based on the plant type used and disease condition. The preferred method was oral, then topical for effective and fast results. The topical method was mostly used in case of injury, wound, allergy or inflammation condition. Chakale et al. (2021) reported similar findings of preferred oral route as faster compared to topical application.

Conclusion

The traditional ethnoveterinary system of treatment is the most trusted and important prevailing system in hilly areas of Jammu. It is more preferred in remote areas with poor availability of veterinary health services due to rough terrain. It is very important to promote cost-effective ethnoveterinary measures to control diseases in livestock. Ethnoveterinary practices are still used as the first line of defence by tribal people to control livestock diseases because of high production cost and resistance developed as a result of excessive use of antimicrobial drugs. It is very important to promote cost-effective ethnoveterinary measures to control diseases in livestock.

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Table 1: Details of ethnoveterinary remedies used by tribal farmers

No.	Botanical name	Family	Local name	Part used	Usage form	Admini- stration mode	Disease/ condition	Dose	Recovery period
	<i>Achyranthes aspera</i>	<i>Amaranthaceae</i>	<i>Puthkanda</i>	Whole plant	Paste	Oral	Swelling	Once a day	2–3 days
	<i>Trachyspermum ammi</i>	<i>Apiaceae</i>	<i>Ajwain</i>	Seed	Powder	Oral	Bloating	Once a day	2–3 days
	<i>Azadirachta indica</i>	<i>Meliaceae</i>	<i>Neem</i>	Leaves	Paste	Oral	Haemorrhagic septicemia	Once a day	5–7 days
	<i>Bambusa bambos (L.) Voss</i>	<i>Bambusa bambos</i>	<i>Baans</i>	Leaves	Leaves	Oral	Retention of placenta	Twice a day	1–2 days
	<i>Cannabis sativa</i>	<i>Cannabaceae</i>	<i>Bhang</i>	Leaves	Paste	Oral	Endo parasitic infection	Once a day	3–5 days
	<i>Allium cepa L.</i>	<i>Amaryllidaceae</i>	<i>Pyaz, Gande</i>	Bulb, raw	Paste	Oral, topical	Cold, fever	Twice a day	2–3 days
	<i>Aloe vera (L.) Burm. f.</i>	<i>Asphodelaceae</i>	<i>Kuargandal</i>	Leaves, whole plant, raw	Paste	Oral	Stomachache	Once a day	2–3 days
	<i>Cannabis sativa</i>	<i>Cannabaceae</i>	<i>Bhang</i>	Leaves	Paste	Topical	Ectoparasitic infestation	Once a day	5–7 days
	<i>Cedrus deodara</i>	<i>Pinaceae</i>	<i>Deodar</i>	Oil or paste	Oil or paste	Topical	Insect infestation	Once a day	2–3 days
	<i>Allium sativum L</i>	<i>Amaryllidaceae</i>	<i>Thoom</i>	Bulb	Paste	Oral	Cough and cold	Twice a day	3–5 days
	<i>Curcuma Longa</i>	<i>Zingiberaceae</i>	<i>Haldi</i>	Rhizome	Paste	Oral	Joint pain	Once a day	5–7 days
	<i>Morus nigra</i>	<i>Moraceae</i>	<i>Shatoot</i>	Leaves	Paste	Topical	Wound injury	One a day	5–7 days
	<i>Brassica Juncea</i>	<i>Brassicaceae</i>	<i>Sarson oil</i>	Plant	Oil	Oral	Tympany	Once a day	2–3 days
	<i>Allium cepa L.</i>	<i>Amaryllidaceae</i>	<i>Ganda</i>	Bulb	Bulb	Oral	Anestrus	Once a day	10–14 days
	<i>Citrus medica L.</i>	<i>Rutaceae</i>	<i>Gargal</i>	Fruit	Raw	Oral	Poisoning	Once a day	1–2 days
	<i>Elwendia persica</i>	<i>Apiaceae</i>	<i>Jangli zeera</i>	Seed	Raw	Oral	Loss of appetite	Twice a day	4–5 days
	<i>Equisetum diffusum D.</i>	<i>Equisetaceae</i>	<i>Rampori</i>	Whole plant	Boiling	Oral	Urolithiasis	Once a day	3–5 days
	<i>Ferula narthex Boiss</i>	<i>Apiaceae</i>	<i>Hing</i>	Root	Raw root	Oral	Indigestion	Once a day	3–5 days
	<i>Brassica rapa L.</i>	<i>Brassicaceae</i>	<i>Shalgam</i>	Leaves	Raw	Oral	Retention of placenta	Once a day	1–2 days
	<i>Datura stramonium L.</i>	<i>Solanaceae</i>	<i>Dhatura</i>	Seeds	Crushed seeds	Oral	Urinary infection	Once a day	5–7 days
	<i>Angelica glauca</i>	<i>Apiaceae</i>	<i>Chora</i>	Root	Crushed root	Oral	Colic, acidity	Twice a day	3–5 days
	<i>Thymus vulgaris L.</i>	<i>Lamiaceae</i>	<i>Van jawain</i>	Leaves	Leaves	Oral	Diarrhea	2–3 times a day	3–5 days
	<i>Prinsepia utilis Royle</i>	<i>Rosaceae</i>	<i>Zintola</i>	Stem	Stem	Oral	Digestive disorder	Twice a day	5 days
	<i>Trigonella foenumgraecum</i>	<i>Fabaceae</i>	<i>Methi</i>	Flower	Raw flower	Oral	Fever	2–3 times a day	3–5 days
	<i>Aconitum laeve Royle</i>	<i>Ranunculaceae</i>	<i>Patis</i>	Root	Aqueous extract	Oral	Worms in liver	Once a day	2–3 days
	<i>Skimmia laureola</i>	<i>Rutaceae</i>	<i>Shungun</i>	Leaves	Raw leaves	Oral	Anaemia	Twice a day	5–7 days