



Advancements in Ethnobotanical Sciences

Bridging Traditional Knowledge and Modern Science

Online ISSN: 0000-0000
Journal homepage: <https://www.jaebs.com>



Ethnoveterinary Survey of Medicinal Plants Used for the Management of Diarrhoea in Sheep in Dehloran County, Iran

Abdulbari A. Alfaris ¹ , Aghakhan Kheiri ^{2*} 

¹ College of Veterinary, University of Basrah, Basrah, Iraq.

² Urmia University of Medical Sciences, Urmia, Iran

Article Info

Article type

Research

Article history

Received: 1 Feb. 2026

Accepted: 20 May 2026

Published: 30 Jun. 2026

DOI

[10.34172/jaebs.2026.9](https://doi.org/10.34172/jaebs.2026.9)

Keywords

Diarrhea

Ethnoveterinary medicine

Ilam province

Indigenous knowledge

Medicinal plants

Sheep

*Corresponding

Author

Email:

dvmkheiri@yahoo.com

ABSTRACT

Background and Objective: Diarrhoea is a common gastrointestinal disorder in domestic livestock, particularly sheep, and may impair growth and productivity and, in severe cases, cause mortality. In rural areas of Iran, livestock keepers continue to rely on indigenous knowledge and medicinal plants for animal healthcare. This study aimed to identify and document medicinal plants traditionally used to manage diarrhoea in sheep in Dehloran county, western Iran.

Methods: The study was conducted in September 2025 in Dehloran county. Ethnoveterinary information was obtained from 45 livestock keepers (38 men and 7 women) through structured questionnaires and face-to-face interviews. Cited plant specimens were collected and identified using recognised floristic references, including Flora of Ilam. For each species, Persian and vernacular names, scientific name, family, plant part used, preparation method and reported therapeutic effect were recorded.

Results: A total of 18 medicinal plant species belonging to 12 botanical families were identified as traditionally used to manage diarrhoea in livestock in Dehloran county. *Lamiaceae* had the highest species diversity, followed by *Apiaceae* and *Plantaginaceae*, indicating the use of a relatively diverse range of indigenous medicinal plants for gastrointestinal disorders.

Conclusions: The findings demonstrate valuable indigenous knowledge concerning the traditional use of medicinal plants for managing diarrhoea in sheep in Dehloran county. The predominance of *Lamiaceae* may reflect its importance in local livestock healthcare practices. Documenting this knowledge may support the preservation of local therapeutic heritage and provide a basis for future pharmacological and veterinary research. However, the efficacy and safety of these plants require rigorous experimental and clinical evaluation before their traditional uses can be incorporated into evidence-based veterinary practice.



Introduction

Diarrhoea is one of the most common gastrointestinal disorders affecting domestic livestock and can occur at different stages of life, with young animals being particularly susceptible. The condition can have substantial health and economic consequences for livestock producers (Jacobson et al., 2020). Diarrhoea is generally characterised by excessive loss of water and electrolytes and may be accompanied by reduced appetite, dehydration, general weakness and weight loss. In severe cases, these effects can impair growth, compromise productivity and ultimately result in animal mortality (Williams & Palmer, 2012). A wide range of factors may contribute to the development of diarrhoea and other gastrointestinal disturbances in livestock, including bacterial, viral and parasitic infections, dietary changes, and ingestion of inappropriate feed, poisoning and adverse environmental conditions (Jacobson et al., 2020). Consequently, effective prevention and management of diarrheal disorders are important not only for maintaining animal health but also for sustaining livestock productivity and the economic well-being of households that depend on animal husbandry (Williams & Palmer, 2012).

In many rural and pastoral communities, particularly in areas where access to professional veterinary services is limited, livestock keepers continue to rely on indigenous knowledge and traditional practices to manage a wide range of animal diseases (McCorkle & Mathias-Mundy, 1992). Such knowledge has evolved over generations through practical experience and observation and has traditionally been transmitted orally within local communities, forming an important component of indigenous livestock healthcare systems (McGaw & Eloff, 2008). Within these systems, medicinal plants play an important role in the traditional management of gastrointestinal, respiratory, dermatological and parasitic disorders in livestock (McGaw & Eloff, 2008). Their continued use may be attributed to several factors, including local availability, relatively low cost, ease of preparation and administration, and longstanding familiarity with their therapeutic applications (McCorkle & Mathias-Mundy, 1992).

The scientific investigation of traditional knowledge concerning animal health and disease management falls within the field of ethnoveterinary medicine (McGaw & Eloff, 2008). Ethnoveterinary medicine encompasses the study, documentation and interpretation of the knowledge, beliefs and practices developed by local communities for the prevention and treatment of animal diseases and health-related conditions (Bartha et al., 2015). In recent years, this field has attracted increasing scientific interest because, beyond its cultural and historical significance, ethnoveterinary knowledge can provide valuable leads for identifying plant species with potential therapeutic properties and guiding subsequent pharmacological and veterinary research (McGaw & Eloff, 2008). Medicinal plants traditionally used in animal healthcare may contain bioactive constituents, including flavonoids, tannins, terpenoids, essential oils and other phenolic compounds, which may exhibit antimicrobial, anti-inflammatory, astringent or gastrointestinal regulatory activities. Nevertheless, traditional use alone cannot be regarded as sufficient evidence of therapeutic efficacy or safety. Rather, ethnoveterinary observations should be considered a valuable starting point for experimental and clinical investigations designed to evaluate the efficacy, mechanisms of action and safety of traditionally used plants (Bartha et al., 2015).

Iran is characterised by considerable climatic and ecological diversity and is consequently recognised as an important region for plant diversity and traditional medicinal-plant knowledge. Ilam Province, in particular, encompasses diverse ecosystems, a rich flora and a longstanding tradition of livestock husbandry, providing considerable potential for ethnobotanical and ethnoveterinary research. Dehloran county, located in the southern part of Ilam Province, has distinctive geographical, climatic and socio-economic characteristics. Livestock husbandry remains an important component of rural livelihoods in parts of the region, and local knowledge concerning the use of medicinal plants therefore retains considerable practical significance. Despite this potential, scientifically documented information on the plants traditionally used by local livestock keepers to

manage animal diseases remains limited, particularly with respect to gastrointestinal disorders and diarrhea in sheep.

Documenting such knowledge is particularly important because it may be progressively lost as a consequence of social change, the increasing adoption of modern therapeutic practices and the weakening of intergenerational transmission of traditional knowledge. Accurate identification of the plants used, together with their local and scientific names, botanical families, plant parts employed and methods of preparation, can provide a clearer understanding of traditional livestock healthcare practices in the region. Moreover, systematic documentation may facilitate the prioritisation of promising species for laboratory-based investigations, including the characterisation of bioactive constituents, assessment of antimicrobial and antidiarrhoeal activities, and subsequent evaluation of their safety and therapeutic efficacy.

Although ethnoveterinary studies have been conducted in some areas of Ilam Province, research specifically addressing the traditional management of diarrhoea in sheep remains limited. Therefore, this study aimed to document medicinal plants used by local livestock keepers for treating sheep diarrhoea in Dehloran county, Ilam Province, western Iran. The study recorded information on plant species, vernacular and scientific names, botanical families, used plant parts, and traditional preparation methods, contributing to the preservation of indigenous ethnoveterinary knowledge.

Methods

Study Area and Participants

This ethnoveterinary survey was conducted in September 2025 in Dehloran county, located in the southern part of Ilam Province, western Iran. The region has a long history of livestock husbandry, and rural communities have traditionally relied on indigenous knowledge and plant-based remedies for managing animal health problems. The present study aimed to document medicinal plants traditionally used by local livestock keepers for managing diarrhoea and other health disorders in sheep. Ethnoveterinary information was collected through semi-structured, face-to-face interviews

using a pre-designed questionnaire. A total of 45 experienced livestock keepers (38 men and 7 women), aged 40–78 years, participated in the study. The interviews focused on traditional knowledge related to the recognition, collection, preparation, administration, and perceived therapeutic applications of medicinal plants used in livestock healthcare.

Selection of Informants and Sampling Method

Informants were selected using purposive sampling based on their experience and knowledge of traditional livestock healthcare practices, particularly the use of medicinal plants for the management of animal diseases. In addition, snowball sampling was employed to identify other knowledgeable individuals through recommendations from initial participants and respected members of local communities.

Participants were recruited from rural areas of Dehloran county to capture variation in demographic characteristics, including age, gender, occupation, and duration of livestock-keeping experience. The inclusion criteria were: (i) long-term involvement in livestock husbandry, (ii) familiarity with traditional plant-based veterinary practices, and (iii) willingness to participate and share ethnoveterinary knowledge. Sociodemographic information and details related to livestock management experience were recorded for each informant.

Plant Collection and Identification

Medicinal plants reported by informants were collected based on local knowledge, vernacular descriptions, and direct field observations. Plant specimens were identified using standard taxonomic references, including the Flora of Ilam Province (Mozaffarian, 2008), and verified based on diagnostic morphological characteristics. For each species, the scientific name, genus, family, and relevant botanical characteristics were recorded.

For every documented plant species, ethnoveterinary information was obtained regarding local names, plant parts utilized, preparation methods, administration routes, and traditional applications in the treatment of livestock health problems, particularly diarrhoea in sheep. The documented species were subsequently categorized according to their reported ethnoveterinary uses.

Geographical Location of the Study Area

The geographical location of Dehloran county, Ilam Province, Iran, is presented in Figure 1.



Figure 1. Location of Dehloran County in Iran.

Results

Detailed information on the medicinal plants traditionally used for the management of diarrhoea in sheep in Dehloran County is presented in Table 1. A total of 18 medicinal plant species belonging to 12 botanical families were identified and documented. The family Lamiaceae was the most frequently represented family, comprising *Thymus daenensis*, *Mentha pulegium*, *Satureja bachtiarica*, *Ziziphora taurica*, and *Stachys lavandulifolia*.

The aerial parts, leaves, seeds, fruits, bark and roots were among the plant parts reported by local livestock keepers for the preparation and administration of the medicinal plants. The documented species represented a range of plant materials and traditional preparations used for the management of diarrhoea in sheep.

The Socio-demographic characteristics of informants participating in the ethnoveterinary survey, including gender, age, occupation, and experience with medicinal plant use in livestock healthcare, are presented in Table 1.

Comprehensive information on the Persian and scientific names, botanical families, plant parts used, methods of preparation or administration, and reported therapeutic applications of the documented species is provided in Table 2.

The distribution of plant families and the relative proportions of the plant parts used are presented in Figures 2 and 3, respectively.

Among the 18 medicinal plant species documented in the study, 12 botanical families were represented. The family Lamiaceae was the most frequently represented, with five species, followed by Apiaceae and Plantaginaceae, with two species each. The remaining families—Fagaceae, Rhamnaceae, Lythraceae, Myrtaceae, Fabaceae, Polygonaceae, Asteraceae, Brassicaceae, and Boraginaceae were each represented by a single species (Figure 2).

With regard to the plant parts used, aerial parts were the most frequently reported, followed by seeds and leaves, which ranked second and third, respectively (Figure 3).

Figure 3. Distribution of the plant parts used in ethnoveterinary practice for the management of diarrhoea.

Table 1. Socio-demographic characteristics of informants participating in the ethnoveterinary survey

Variable	Category	Number (n)	Percentage (%)
Gender	Male	38	84.4
	Female	7	15.6
Age group (years)	40–50	12	26.7
	51–60	17	37.8
	>60	16	35.5
Place of residence	Rural areas of Dehloran County	45	100.0
Main occupation	Livestock keeper	28	62.2
	Farmer and livestock keeper	12	26.7
	Other rural occupations	5	11.1
Livestock type managed	Sheep only	21	46.7
	Sheep and goats	24	53.3
Years of livestock-keeping experience	<20 years	8	17.8
	20–40 years	24	53.3
	>40 years	13	28.9
Number of managed livestock (heads)	<50 animals	14	31.1
	50–100 animals	20	44.4
	>100 animals	11	24.5
Experience with medicinal plant use in livestock healthcare	<10 years	6	13.3
	10–30 years	22	48.9
	>30 years	17	37.8

Table 2. Ethnoveterinary information on medicinal plants traditionally used for the management of diarrhoea in sheep in Dehloran County, western Iran.

Persian/Vernacular name	Scientific name	Family	Plant part used	Reported therapeutic use
Iranian oak	<i>Quercus brantii</i>	Fagaceae	Fruit, bark	Management of diarrhoea
Christ's thorn jujube	<i>Ziziphus spina-christi</i>	Rhamnaceae	Leaves	Management of diarrhoea
Daenian thyme	<i>Thymus daenensis</i>	Lamiaceae	Aerial parts	Management of diarrhoea
Pennyroyal	<i>Mentha pulegium</i>	Lamiaceae	Aerial parts	Management of diarrhoea
Cumin	<i>Cuminum cyminum</i>	Apiaceae	Seeds	Management of diarrhoea
Pomegranate	<i>Punica granatum</i>	Lythraceae	Bark, fruit	Management of diarrhoea
Greater plantain	<i>Plantago major</i>	Plantaginaceae	Leaves, seeds	Management of diarrhoea
Psyllium	<i>Plantago psyllium</i>	Plantaginaceae	Seeds	Management of diarrhoea
Myrtle	<i>Myrtus communis</i>	Myrtaceae	Leaves	Management of diarrhoea
Bakhtiari savory	<i>Satureja bachtiarica</i>	Lamiaceae	Aerial parts	Management of diarrhoea
Liquorice	<i>Glycyrrhiza glabra</i>	Fabaceae	Root	Management of diarrhoea
Rhubarb	<i>Rheum ribes</i>	Polygonaceae	Root, stem	Management of diarrhoea
Wormwood	<i>Artemisia absinthium</i>	Asteraceae	Aerial parts	Management of diarrhoea
Flixweed	<i>Descurainia sophia</i>	Brassicaceae	Seeds	Management of diarrhoea
Ziziphora	<i>Ziziphora taurica</i>	Lamiaceae	Aerial parts	Management of diarrhoea
Prickly viper's bugloss	<i>Echium strigosum</i>	Boraginaceae	Flowers	Management of diarrhoea
Oliveria	<i>Oliveria decumbens</i>	Apiaceae	Aerial parts	Management of diarrhoea
Mountain tea	<i>Stachys lavandulifolia</i>	Lamiaceae	Aerial parts	Management of diarrhoea

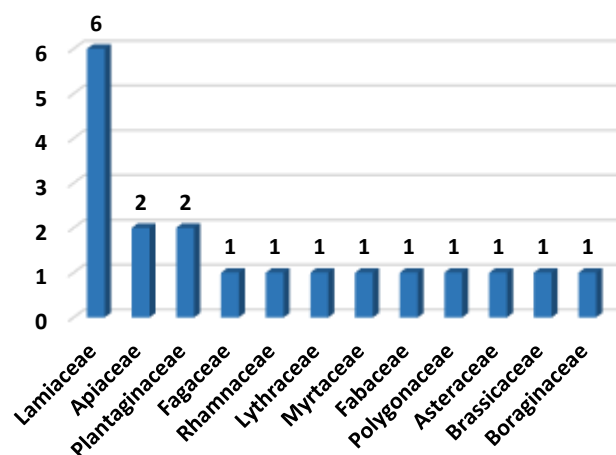


Figure 2. Distribution of the documented medicinal plant species by botanical family.

Discussion

The present study documents the ethnoveterinary knowledge of local livestock keepers in Dehloran County regarding medicinal plants traditionally used for the management of diarrhoea in sheep. A total of 18 medicinal plant species belonging to 12 botanical families were recorded, demonstrating the diversity of plant-based remedies incorporated into local livestock healthcare practices. Unlike many previous ethnoveterinary investigations that have addressed a broad range of animal diseases,

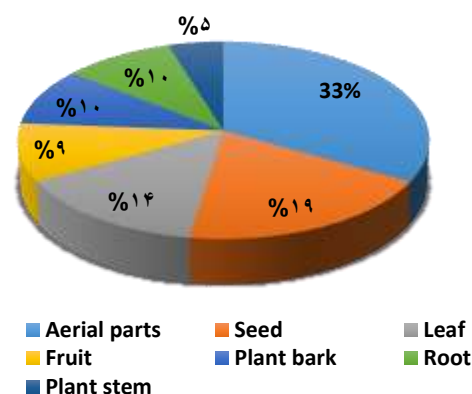


Figure 3. Percentage distribution of the plant parts used in ethnoveterinary practice.

this study specifically focused on diarrhoea in sheep, providing a disease-oriented assessment of indigenous veterinary knowledge in the Zagros region.

The documentation of these medicinal plants contributes to the preservation of local ethnoveterinary heritage and provides a valuable basis for future phytochemical, pharmacological, and veterinary investigations (Bahmani et al., 2010). Nevertheless, reported traditional uses

should be interpreted as indicators of cultural relevance and potential biological interest rather than as direct evidence of therapeutic efficacy. Further experimental studies are required to evaluate the pharmacological activity, safety profile, effective dosage, and mechanisms of action of the documented species.

The family *Lamiaceae* showed the highest representation among the recorded medicinal plants, including *Thymus daenensis*, *Mentha pulegium*, *Satureja bachtiarica*, *Ziziphora taurica*, and *Stachys lavandulifolia*. The frequent occurrence of *Lamiaceae* species may be related to their local availability and cultural familiarity, particularly within Zagros habitats. Many members of this family are rich in essential oils and phenolic compounds that have demonstrated biological activities in previous investigations. Therefore, the recorded *Lamiaceae* species may represent promising candidates for future evaluation; however, taxonomic affiliation and traditional preference alone cannot confirm antidiarrhoeal efficacy.

The use of medicinal plants for gastrointestinal disorders has been widely reported in ethnoveterinary studies from different geographical regions. Khattak et al. and Tariq et al. documented numerous medicinal plants used for livestock healthcare in Pakistan, including remedies for digestive disorders (Khattak et al., 2015, Tariq et al., 2014). Similarly, Upadhyay et al. (2011) reported extensive traditional knowledge related to gastrointestinal problems in livestock in India (Upadhyay et al., 2011). The frequent targeting of digestive disorders in ethnoveterinary practices across different cultures may reflect their considerable impact on animal health, productivity, and rural livelihoods. However, variations in the reported plant species among regions are likely influenced by differences in ecological conditions, local flora, cultural practices, and mechanisms of knowledge transmission.

Compared with large-scale ethnoveterinary surveys, the number of plant species recorded in Dehloran County was relatively limited. This difference is expected because the present study was designed specifically to investigate plants used for diarrhoea management in sheep rather than documenting all veterinary plant applications. The disease-specific approach provides a more focused

understanding of traditional therapeutic strategies associated with an economically important livestock disorder.

The predominance of aerial plant parts among the documented remedies may reflect their accessibility and relatively lower harvesting impact compared with underground organs. The predominance of aerial plant parts among the documented remedies may reflect their accessibility and ease of collection compared with underground organs. However, long-term ecological studies are required to assess harvesting sustainability and potential effects on wild plant populations, particularly for frequently used species.

The ecological characteristics of the Zagros region likely contribute to the development and maintenance of local ethnoveterinary knowledge. The presence of diverse habitats, including rangelands, mountainous landscapes, and oak-dominated forests, provides access to a variety of medicinal plant resources. Continuous interactions between livestock keepers and these environments have likely facilitated the accumulation and transmission of knowledge related to plant recognition, collection, preparation, and application in animal healthcare.

Several documented species, including *Thymus daenensis*, *Mentha pulegium*, *Satureja bachtiarica*, *Quercus brantii*, and *Punica granatum*, deserve further investigation due to their previously reported phytochemical constituents. Plants containing essential oils, tannins, and polyphenolic compounds may have potential relevance for antimicrobial, anti-inflammatory, antioxidant, or gastrointestinal-related activities. However, these interpretations should be considered preliminary hypotheses requiring confirmation through laboratory experiments and veterinary investigations.

This study has several limitations. First, the research was conducted in a single county with a relatively limited number of informants; therefore, the findings may not be fully representative of other geographical regions. Second, the data were based on self-reported traditional knowledge, which may be influenced by recall bias and individual variations in experience. Third, the therapeutic efficacy, optimal dosage, safety profile, and standardization of the reported remedies were

not experimentally evaluated. Furthermore, the specific etiological agents responsible for diarrhoea, including bacterial, parasitic, viral, or nutritional factors, were not investigated. Finally, data collection was performed during a single season. Therefore, multi-seasonal surveys and pharmacological, toxicological, and veterinary studies are needed to further evaluate and validate the documented ethnoveterinary practices.

Conclusion

Overall, the present study demonstrates that livestock keepers in Dehloran County possess a diverse body of ethnoveterinary knowledge concerning the traditional management of diarrhoea in sheep. A total of 18 medicinal plant species representing 12 botanical families were documented, with Lamiaceae, represented by five species, being the most frequently represented family. The predominance of aerial plant parts suggests a distinctive pattern of plant selection and utilisation within the local ethnoveterinary system. Comparisons with previous studies from Iran, Pakistan, India, and Ethiopia indicate that the traditional use of medicinal plants for gastrointestinal disorders, particularly diarrhoea, is a recurring component of livestock healthcare systems, although the species selected vary according to local ecological conditions, plant availability, and cultural practices. The medicinal plants documented in Dehloran represent an important component of the region's cultural and therapeutic heritage and may also provide valuable leads for future veterinary and pharmacological research. Further investigations should incorporate quantitative ethnobotanical indices, such as the informant consensus factor (ICF), use value (UV), and fidelity level (FL), together with phytochemical profiling, toxicity assessment, and controlled experimental and veterinary studies. Such an integrated approach could help prioritise promising species and determine whether their traditional use for the management of diarrhoea is supported by reproducible pharmacological and veterinary evidence. Importantly, the present findings document traditional practices but do not establish the clinical efficacy or safety of the reported medicinal plants.

Declarations Conflict of Interest

The authors declare no conflicts of interest.

Acknowledgments

The authors would like to express their gratitude to the Urmia University of Medical Sciences, Urmia, Iran, for supporting.

Consent for Publications

The authors certify that that this work in its final form has been thoroughly reviewed and approved for publication.

Funding Support

The authors did not receive support from any organization for the submitted work.

Authors' Contributions

Conceptualization: Aghakhan Kheiri
Data curation: Aghakhan Kheiri
Formal analysis: Aghakhan Kheiri
Funding acquisition: Aghakhan Kheiri
Methodology: Aghakhan Kheiri
Project administration: Aghakhan Kheiri
Resources: Aghakhan Kheiri
Software: Aghakhan Kheiri
Supervision: Abdulbari A. Alfari
Validation: Aghakhan Kheiri
Visualization: Abdulbari A. Alfari
Writing original draft:
Writing review & editing: Abdulbari A. Alfari

Ethical Considerations

This study was performed in line with the principles of the Declaration of Helsinki

AI Use Disclosure

The authors declare that AI tools were not used to generate or develop the scientific content of this manuscript. AI was used solely for English language editing, grammar correction, and improving sentence clarity and readability. The authors take full responsibility for the final content.

References

Bahmani, M., Avijgan, M., Hosseini, S. R., Najafzadeh Varzi, H. and Mehrzadi, S. (2010). Use of medicinal plants from the southern regions of Ilam

Province in the treatment of diseases and clinical syndromes of small ruminants. *Journal of Herbal Drugs*, 1(2), 51-60.

Bartha, S. G., Quave, C. L., Balogh, L. and Papp, N. (2015). Ethnoveterinary practices of Covasna County, Transylvania, Romania. *Journal of Ethnobiology and Ethnomedicine*, 11, 35. doi:10.1186/s13002-015-0020-8.

Jacobson, C., Larsen, J. W., Besier, R. B., Lloyd, J. B. and Kahn, L. P. (2020). Diarrhoea associated with gastrointestinal parasites in grazing sheep. *Veterinary Parasitology*, 282, 109139. doi:10.1016/j.vetpar.2020.109139.

Khattak, N. S., Nouroz, F., Rahman, I. U. and Noreen, S. (2015). Ethno-veterinary uses of medicinal plants of district Karak, Pakistan. *Journal of Ethnopharmacology*, 171, 273-279. doi:10.1016/j.jep.2015.05.048.

Mccorkle, C. M. and Mathias-Mundy, E. (1992). Ethnoveterinary medicine in Africa. *Africa: Journal of the International African Institute*, 62(1), 59-93. doi:10.2307/1160064.

McGaw, L. J. and Eloff, J. N. (2008). Ethnoveterinary use of southern African plants and scientific evaluation of their medicinal properties. *Journal of Ethnopharmacology*, 119(3), 559-574. doi:10.1016/j.jep.2008.06.013.

Mozaffarian, V. (2008). *Flora of Ilam*, Tehran, Iran, Farhang-e Moaser Publication.

Tariq, A., Mussarat, S., Adnan, M., Abdelsalam, N. M., Ullah, R. and Khan, A. L. (2014). Ethnoveterinary study of medicinal plants in a tribal society of Sulaiman range. *The Scientific World Journal*, 2014, 127526. doi:10.1155/2014/127526.

Upadhyay, B., Singh, K. P. and Kumar, A. (2011). Ethno-veterinary uses and informants consensus factor of medicinal plants of Sariska region, Rajasthan, India. *Journal of Ethnopharmacology*, 133(1), 14-25. doi:10.1016/j.jep.2010.08.054.

Williams, A. R. and Palmer, D. G. (2012). Interactions between gastrointestinal nematode parasites and diarrhoea in sheep: Pathogenesis and control. *The Veterinary Journal*, 192(3), 279-285. doi:10.1016/j.tvjl.2011.10.009.