Open Access

© 2023, Centre for Advanced Research in Agricultural Sciences
Research Journal of Agricultural Sciences
Volume 14; Issue 05 (Sep-Oct 2023); pp 1414–1420

ISSN: 0976-1675 (P)
ISSN: 2249-4538 (E)

Full Length Research Article

Ethno-veterinary Study of Medicinal Plants in of Shekhawati Region of Rajasthan

Anita Jain[1] and Shankar Lal Kajala*[2]

[1] Department of Botany, Vidya Bhawan Rural Institute, Udaipur - 313 001, Rajasthan, India
[2] Mohanlal SuKhadia University, Udaipur - 313 001, Rajasthan, India

Abstract

The goals of this research were to (i) describe ethno-veterinary plants and their formulation procedures in an undiscovered Shekhawati region, and (ii) choose prospective medicinal plants with higher fidelity value for subsequent in vitro examination. A semi-structured questionnaire was used to interview a group of 40 people. In the study region, 28 plants from 23 families were utilized to heal livestock problems. Whole plants (39%) were usually employed in the form of paste and powder in the formulations. The bulk of the plants were used to treat cow and buffalo problems, while gastrointestinal and skin infections were found to be more prevalent. *Allium cepa Linn.* rated first with a FL value of 93%, followed by *Curcuma longa Linn.* ranked second (91%), *Punica granatum Linn*. ranked third (90%), and *Cassia tora Linn*. ranked fourth (85%). Plants with significant FL scores might be studied in vitro for the discovery of new bioactive chemicals, and young people should be taught about ethno-veterinary practices.

***Key words*:** Ethno-veterinary, Herbal plants, Medicinal, Traditional, Ailments, Fidelity level

Ancient veterinary treatment dates back to the reign of King Hammurabi of Babylon, who developed regulations on veterinary fees and charges for curing animals in the year 1800 B.C. [1]. Following the introduction of early western pharmaceuticals, numerous ethno-veterinary treatments were overlooked. Owing to the development of several beneficial ethno-veterinary items during the previous decade, ethno-veterinary techniques have attained enormous relevance [2]. Conventional veterinary treatments are less expensive and easier to obtain than modern pharmaceuticals [3]. Because of many socioeconomic circumstances, ethno-veterinary practices are more frequent in developing countries [4-5].

India's diverse and rich vegetation offers a vital reservoir of medicinal herbs. Herbal medicines have been known for a long time and are mentioned in historical documents like the Rig Veda, Garuda Purana, and Agni Purana. These monographs are concerned with the ability of plants and herbs to heal human illnesses. Various ethno veterinarian practices dependent on plant medications are increasingly being documented by scientists. India's flora diversity also provides a great resource for livestock owners in terms of treating animal disorders and maladies. India's rural area accounts for 76% of the population [6].

Rajasthan is situated in India's northwestern corner. It is located around 69'30' and 78'17' latitude and 23'3' and 30'12' east longitude. Shekhawati is a semi-arid geographic area in Rajasthan, India, that takes its name from the Shekhawat Rajputs. Shekhawati residents are known for being brave, selfless, and diligent. The Indian Army receives the most personnel from this area. Along with its valiant, devoted, and diligent Jat-Rajput people, who are legendary kings and military warriors, Shekhawati is also regarded as the Scotland of India. The Shekhawati region has generated a significant number of Marwaris, who have become an important part of India's economy. Marwaris handle around 80% of large industrial firms. Marwaris include India's wealthiest businessmen of the era, like the Birlas and Dalmia. Shekhawati is home to India's largest commerce and manufacturing businesses today. The Shekhawati area's structures were mostly built during the 18th and early 20th centuries. Traders used this pattern for their structures under the British administration. The frescos illustrating mythological and historical topics are well-known in the havelis. Pictures of gods, goddesses, animals, and the lives of Lords Rama and Krishna are abundantly carved on the havelis in this area [7].

The agro - based commerce of central Rajasthan relies heavily on different kinds of cattle. The territory is home to sheep, goats, buffaloes, cows, dogs, bulls, and camels. Cattle are believed to be the indigenous people's riches, and their well-being is extremely essential. Some animal illnesses necessitate the aid of a veterinarian. Individuals depend on conventional veterinary practices because veterinary hospitals are far distant. In the administration and rising of animals, no single tribe or ethnic group is engaged. Medicine men, all of whom are

Received: 10 May 2023; Revised accepted: 25 Sep 2023; Published online: 30 Sep 2023

Correspondence to: Shankar Lal Kajala, Department of Botany, Vidya Bhawan Rural Institute, Udaipur - 313 001, Rajasthan, India, Tel: +91 7597758963; E-mail: shankarlalkajla1863@gmail.com

Citation: Jain A, Kajala SL. 2023. Ethno-veterinary study of medicinal plants in of Shekhawati region of Rajasthan. *Res. Jr. Agril. Sci.* 14(5): 1414-1420.

members of one line of generational indigenous professionals, hold the indigenous strategies of plant-based treatments for animal healing. Knowledge and insight are carried down through the generations and are well protected treasures. The medicine men usually gather the plant required for a certain veterinary treatment direct from the forest or from nearby shops.

As per World Health Organization, at minimum 80% of individuals in underdeveloped nations rely on indigenous methods to regulate and manage illnesses both humans and animals. Ethno veterinary medicine is the name given to these ancient treatment methods. Ethno veterinary treatment is both affordable and adaptable. Ethno veterinarian therapies are readily available, simple to produce, and administer, and they cost the farmer little or nothing. These centuries-old procedures apply to all veterinary specialties and cattle species. Ethno veterinary medicine varies not only from one place to the next, but also within and between groups. Ethno veterinary medicine (EVM) is a strategy for treating illnesses and preserving animal wellness that is focused on indigenous ideas, conventional information, abilities, methodologies, and practices. Conventional veterinary medicine information, like all conventional information systems, is passed down orally from progeny to progeny and is at risk of extinction as a consequence of quick socioeconomic, environmental, and technological modifications, as well as cultural heritage under the pretence of civilization. The situation of ethno-veterinary medicine is reported to be stable. Everyone has accessibility to advanced veterinary services, but many still choose to use conventional treatments and therapists. Consumers of ethno-veterinary medicines and ethno-veterinary professionals have significant opinions about their efficacy. Furthermore, they stated that allopathic medication is costly and occasionally has adverse impacts. EVPs were widely used in the research area, according to veterinary officials and veterinary helpers.

Growth and advancement have displaced tribal information and practices at an astonishing speed during the last many decades. Many advancement initiatives, however, have proven to be unsustainable: when funding runs out, native individuals are faced with a predicament: they can no longer acquire or access the techniques and facilities brought in from the outside, but they have neglected their own 'indigenous' information, or their surroundings has altered, along with the assets required to implement their indigenous information. To overcome those problems, proponents of resilient bottom-up growth argue that revitalizing indigenous information within societies and transferring it between people can lead to long-term and cost-effective remedies. This is also accurate in case of livestock growth. Indigenous livestock administration and healthcare (ethno veterinary medicine) have enormous growth opportunity. Still, ethno veterinary knowledge and practises have been sluggish to be included into cattle growth plans and initiatives [8].

As a result, the current research project was created to establish comprehensive ethno-veterinary understanding of an understudied area in India. The present study was designed with the objectives (i) Documentation of unreported ethno-veterinary practices among the rural people of study area. (ii) Collection, identification and herbarium preparation of ethno-veterinary plant species of study area. (iii) To assess credibility of the documented ethno-veterinary practices by using statistical analysis. (iv) Preparation of checklist on the basis of rating of credibility. This checklist will be used for the bio-prospecting of traditional resources. (v) To record case studies data for selected infectious animal diseases for validation. (vi) Scientific validation of selected ethno-veterinary medicinal plants (having high credibility and used to cure infectious diseases) for their anti-microbial activities. (vii) Development and action plan will be prepared for herbal drug industry on the basis of data generated by work, for improving and uplifting the life and economy of the tribals of Northern Rajasthan. The current study will give Phyto chemists, pharmacologists, and conservationists with a guideline for subsequent research projects. This work would also contribute significantly to the preservation of this important information.

MATERIALS AND METHODS

(i) *Study area*

The Shekhawati area of Rajasthan is comprised of the Jhunjhunu and Sikar districts, which are bordered on the east by Haryana and on the west by Rajasthan's Jaipur, Nagour, and Churu districts. Western Rajasthan is the closest area of the Indian Thar Desert. The districts of Sikar (7,742 km^2) and Jhunjhunu (5,928 km^2) are located between 270 21' and 280 12' north latitude and 740 44' and 750 25' east longitudes, respectively. The region is mostly semi-arid or desert, with a few mountainous spots like Lohagal, Harshnath, Khetri, Babai, Manasamata, and Shakambari. Sand dunes and sandy plains cover the rest of the Shekhawati [9]. The Rajasthan Bagar covers nearly two-thirds of the area, while the Aravalli hills cover the rest (towards the north-east). Indigenous therapists in Rajasthan's Shekhawati area have an impressive understanding of the medicinal properties of the plants that grow nearby. Owing to industrialization and the propensity amongst new generations to abandon their conventional lifestyles, Shekhawati rural people's wisdom is rapidly fading. It is critical to research and record this priceless information for the sake of human society's future generations. It is also losing importance as a result of the shortage or non-availability of such plants, which is generated by a variety of human behaviors as well as natural disasters such as droughts and overgrazing. As a result, the preservation and scientific confirmation of such uncommon and lesser-known medicinal plants become more important [10].

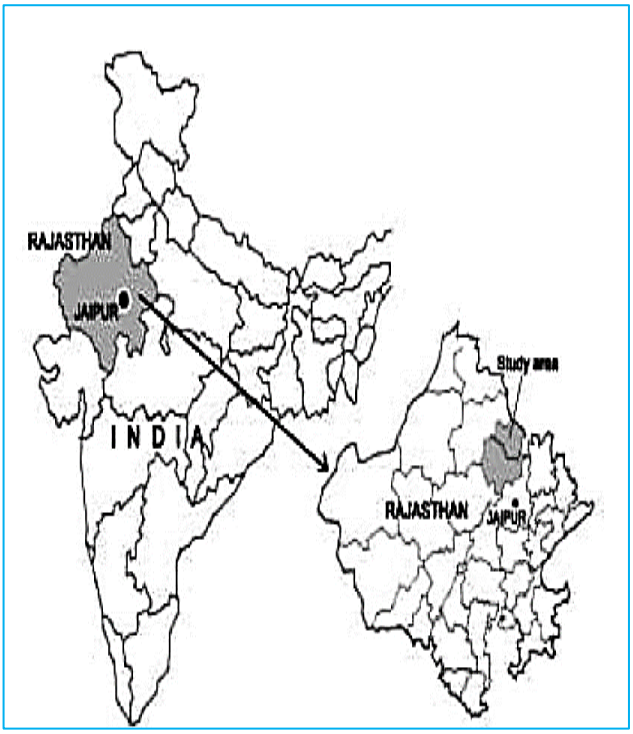

Fig 1 Map of study area (Shekhawati region) of Rajasthan

(ii) *Sampling and data collection*

Field work was completed from Shekhawati region of Rajasthan. Initially, the research area's local administrative officers and representative (Sarpanch) were contacted for details on relevant resource personnel in the domain of ethno-veterinary medicinal plants. They recommended 40 sources with extensive conventional livestock treatment information. Of the 40 people interviewed, 25 were farmers and 15 were nomads. Before the information extraction, the informants were given a short group talk to describe the main issue of the project and obtain their approval to have their indigenous information published. This was done to thank informants for their help in conserving conventional understanding in the research area and to increase their trust in delivering accurate data. Every informant was individually questioned in their native tongue. Semi-structured surveys with comprehensive ethno-veterinary knowledge were created (Hindko). Interviewees were questioned how many plants they utilize to heal their cattle, the parts of the plant they utilize, recipes formulation, route, and other important questions.

(iii) *Data organization or documentation*

Microsoft Excel 2007 and Microsoft Word 2007 were used to organize the information gathered from the informants. Herb, shrub, tree, and climber plants were classified into four categories. Leaves, stems, roots, complete plants, seeds, and fruit were all classed as plant components. The six principal classes of medicinal plant usage are gastrointestinal, dermatological, anthelmintic, antidiuretic, wound healing and general body tonic. Decoction, powder, crushed, juice, paste, poultice, infusion, and concoction were the diverse categories of recipes. Oral and dermal administration routes were separated into two groups.

(iv) *Data analysis and credibility assessment*

The statistical review of information acquired during the field survey and literature study was used to evaluate the authenticity of ethno-veterinary practices. The fidelity level (FL) is used in statistical data assessment to validate the relevance of medicinal herbs.

(v) *Fidelity level (FL)*

FL is excellent for identifying the interviewees' most favorite plants for treating specific conditions. Plants that are greatly desired always have higher FL values than ones that are lesser favored. FL is usually expressed as a proportion of respondents who claim to use a specific plant species for the same primary purpose. FL's major goal is to determine the value of plant species for a certain use. The FL value was calculated using the formula FL = Ip/Iu 100, where Ip is the total number of respondents who cited the same plant for any sickness and Iu is the number of respondents who mentioned the same plant for any ailment [11]. It is considered that medicinal herbs that are utilized for the same ailment group on a regular basis are more prone to be physiologically active [12-13].

(vi) *Collection and preservation of the reported medicinal plants*

Field expeditions were taken with native informants to gather the medicinal plants that had been mentioned. The medicinal herbs were taken to the laboratory of VBRI college, Udaipur for additional processing. The vegetation of India and taxonomic expertise were used to identify and validate the specimens. Plants were left to dry and compressed on herbarium sheets before being submitted in the herbarium of botany department of Botany, VBRI College, Udaipur [13].

(vii) *Case studies for validation*

As per the field study and a major ailment in the area, various frequent animal ailments were chosen for case studies. With the cooperation of the ethno-veterinary specialist and under the observation of a licensed medical professional, authentic ethno-veterinary therapy was documented. With the cooperation and approval of normal qualified veterinary doctors, the specifics of modern veterinary medical therapy for the same ailment were also documented. This allowed researchers to determine whether ethnic practices are more efficient, less efficient, or comparable to contemporary medicine. The following data was collected: animal diseases and symptoms, ethno-veterinary medicinal plants used, crude medication synthesis, dosage administered by ethno-veterinary specialist, outcomes, and recovery period.

(viii) *Phytochemical studies*

Certain major ethno-veterinary medicinal plant species from known ethno-veterinary practices were chosen for phytochemical investigations, despite having less or no knowledge regarding their phytochemical qualities. Fresh material as well as dried powder was employed for future research. Plant tissue was assessed qualitatively for various bioactive components, including secondary metabolites such as Alkaloids (nervous system depressant, anti-microbial); Flavonoids (antioxidant, anti-inflammatory, anti-allergic, anti-carcinogenic, antiviral, and antibacterial); Tannins (anti-carcinogenic, anti-mutagenic, anti-microbial, and antibacterial); Steroids (anti-inflammatory); Saponins (hemotoxic which excite the Standard approved procedures were used to detect bioactive substances [14-17].

(ix) *Evaluation of antimicrobial activity*

Standardized approved procedures was used to test the antimicrobial potential of ethno-veterinary medicinal plant species [18-21].

RESULTS AND DISCUSSION

Native farmers in the Shekhawati area use 28 medicinal plants belong to 23 families to cure various forms of livestock illnesses, according to the current study (Table 1). The Liliaceae family was reported to be the most prevalent in the survey location, with *Apocynaceae*, *Solanaceae*, and *Poaceae* being used in ethno-veterinary treatments. For the manufacture of ethno-medicines, conventional farmers primarily used herbs (57.14), preceded by shrubs (28.57).

Table 1 Habit and parts used of ethno-veterinary plants

General attributes	Total plants (28)	Percentage (%)
	Habit	
Herbs	16	57.14
Shrubs	08	28.57
Trees	03	10.71
Climbers	01	3.57
	Parts used	
Whole plant	11	39.28
Leaves	10	35.71
Root	05	17.85
Fruit	03	10.71
Stem	02	7.14
Seed	02	7.14

Nearly all plant parts were utilized for medical uses, although whole plants (39.28) were the most common, followed by leaves (35.71), roots (17.85), and fruits (10.71) (Table 2).

Local farmers employed these ethno-medicines to cure buffaloes, cows, goats, sheep, and donkeys, among other domesticated animals. A variety of disorders were managed, which were divided into six groups. Gastrointestinal illnesses were identified to be the most frequent in household animals, and nine plants were employed to treat them. Three plants were utilized to treat wounds, and two plants were utilized to treat skin disorders. Native farmers make a variety of ethno-medicines, although powder (8 plants) and decoction (7 plants) were the most popular approaches in the study area. Oral dosage was the most prevalent (75%) preceded by cutaneous application (14%).

Table 2 Ethno-veterinary plants used for the treatment of livestock ailments in Shekhawati Region

Plants name/family name	Local names	Habit	Part used	Ailment treated	Animal treated	Recipe	Route
Achyranthes aspera Linn. (*Amaranthaceae)*	Gishkay	Herb	Whole plant	Anthelmintic and delivery	Buffalo, cow, goat, sheep	Powder	Oral
Allium cepa Linn. (*Amaryllidaceae)*	Pyaz	Herb	Whole plant	Febrifuge, tonic	Sheep, goat	Decoction	Oral
Allium sativum Linn. (Liliaceae)	Matar	Herb	Stem	Gastrointestinal	Goat	Concoction	Oral
Aloe barbadensis Mill. (*Liliaceae)*	Guvarpatha	shrub	Root	Gastrointestinal	Buffalo, cow, goat, sheep	Powder	Oral
Asparagus gracilis Royle. (*Liliaceae*)	Lachgawa	Herb	Root	Delivery	Goat	Concoction	Oral
Brassica campestris L. (*Brassicaceae)*	Sarson	Herb	Whole plant	External lice	Cow, buffalos	Paste	Dermal
Calotropis procera (Willd.) R.Br. (*Apocynaceae)*	Spulmaey	Shrub	Fruit, leaves	Intestinal worms and skin infections	Buffalo, cow, goat, sheep	Paste, concoction	Oral, Dermal
Cannabis sativa Linn. (*Cannabaceae*)	Bhang	Shrub	Leaves	External parasites, appetizer	Cow, donkey, buffalo	Poultice, powder	Dermal, oral
Cassia tora (Linn.) Roxb (Caesalpiniaceae)	Coffee pod	Herb	Seeds	Wound, Constipation, Skin diseases	Goats	Powder	Dermal, Oral
Chenopodium album Linn. (*Amaranthaceae*)	Bathua	Herb	Whole plant	Wound healing	Goat, sheep, cow	Paste	Dermal
Chrysanthemum leucanthemum Linn. (*Asteraceae*)	Chitti pulari	Herb	Whole plant	Increase milk production	Cow, buffalo, goat	Powder	Oral
Convolvulaus arvensis Linn. (*Convolvulaceae)*	Shankpuspi	Herb	Whole plant	Constipation	Cow buffalo, sheep	Crushed	Oral
Coriandrum sativum Linn. (*Apiaceae*)	Dhania	Herb	Leaves, root	Antidiuretic	Buffalo, cow	Decoction water	Oral
Curcuma longa Linn. (*Zingiberaceae*)	Haldi	Herb	Leaves, root	Antidiuretic	Buffalo, cow	Decoction water	Oral
Cynodone dactylon Linn. (*Poaceae*)	Dubhghas	Herb	Whole plant	Wound healing, analgesic	Cow, buffalo	Concoction	Oral
Datura inoxia Mill. (Solanaceae)	Mangaz	Herb	Whole plant	Antilice	Sheep, cow	Paste	Dermal
Melia azedarach Linn. (*Meliaceae*)	Dhrek	Tree	Leaves	Stomach flatulence	Cow, buffalo	Powder	Oral
Mentha arvensis Linn. (*Lamiaceae*)	Pudina	Herb	Leaves	External parasite	Cow	Paste	Oral
Morus alba Linn. *(Moraceae)*	Sahtoot	Tree	Leaves, fruit	Laxative	Buffalo, cow	Crushed	Oral
Nerium oleander Linn. (Apocynaceae)	Ghanderay	Shrubs	Whole plant	Stomachache	Sheep	Concoction	Oral
Ocimum basilicum Linn. (Lamiaceae)	Kshmalay	Shrub	Leaves	Gastrointestinal	buffalo	Decoction	Oral
Punica granatum Linn. (Lythraceae)	Anar	Shrub	Fruit, leaves	Anthelmintic	Cow, buffalo, goat	Decoction	Oral
Solanum surrattense Burm.f. (Solanaceae)	Kandiari	Herb	Whole plant	Fever, cough, intestinal infections	Cow, buffalo, goat, sheep	Crushed	Oral
Tinospora cordiflolia Miers. (Menispermaceae)	Giloe	Climber	Whole plant	Skin infections	Cow, goat	Poultice	Dermal
Trifolium repens Linn. (Papilionaceae)	Shoutal	Shrub	Root	Tonic, laxative	Goat, cow	Powder	Oral
Triticum aestivum Linn. (Poaceae)	Gandam	Herb	Seeds	Common cold, dysentery	Cow	Powder	Oral
Vitex negundo Linn. (Verbenaceae)	Marmandi	Shrub	Stem	Mange, fever, stomach	Cow, goat	Crushed, Decoction	Oral
Zizyphus nummularia W. & A. (Rhamnaceae)	Kurkunda	Tree	Leaves	Wound healing	Cow	Decoction	Oral

The current study discovered seven therapeutic plants with a high FL value (Table 3). The FL readings in this research ranged from 1% to 100%. *Allium cepa* came in first with the greatest FL value (93%), followed by *Curcuma longa* (91%), *Punica granatum* (90%), and *Tinosporia cordifolia* (85%). The majority of the participants surveyed were between the ages of 45 and 65. Women and the younger generation did not use ethno-veterinary medicine.

Table 3 Fidelity level (FL) of highly utilized species

Number	Plant species	Disease category	Ip	Iu	FL %
01	*Allium cepa* Linn. (*Amaryllidaceae)*	General body tonic	29	31	93
02	*Curcuma longa* Linn. (*Zingiberaceae*)	Antidiuretic	32	35	91
03	*Punica granatum Linn. (Lythraceae)*	Anthelmintic	28	31	90
04	*Cassia tora (Linn.) Roxb (Caesalpiniaceae)*	Dermatological, Gastrointestinal, Wound healing	23	27	85
05	*Triticum aestivum Linn. (Poaceae)*	Gastrointestinal	24	29	82

One of the most significant economic resources in the study area's rural community is animal husbandry. Farmers and nomadic residents in the region not only rely on plants for food, but also use a variety of medicinal plants to cure distinct animal ailments. The large percentage of individuals surveyed who used ethno-veterinary plants heard about them from their forebears, while others learned from others. Because of their inability to buy contemporary veterinary treatments for their animals' therapy, the mass of farmers and nomads foragers were poor and highly reliant on therapeutic plants. Individuals in that area employ 28 medicinal herbs for animal health care, according to the current investigation. Related research has been conducted in various locations of India [22]. Herbs are commonly used by traditional practitioners in the location to cure their livestock, which may be owing to the truth that herbs are readily accessible and easier to gather when compared to other growth forms. The profusion of herbs in the research area, as well as their widespread use, may be related to herbaceous plants' great efficiency in treating cattle problems. Benitez *et al*. [23] observed similar outcomes in other research performed in other locations of the world. This Liliaceae family is more widely used, which could be due to its greater proportion in the research region or its high bioactivity [24-26]. The disparity across research could be due to the various dominating flora in various places, or it could be due to diverse cultures' traditional views about how to use certain plants. In the research area, leaves or whole plants are used in the majority of ethno-veterinary recipes [13].

A huge number of ethno-medicinal and ethno-veterinary researches from all around the world have recorded the greatest utilization of leaves [25]. The preference for leaves over other plant parts could be due to their ease of gathering. Leaves are the primary location of photosynthetic machinery, and they are engaged in a range of physiological functions, as well as producing a large number of secondary metabolites, which could be a factor for their usefulness and potency against certain animal diseases. Locals also use whole plants for herbal formulations, which could be a particularly harmful manner of harvesting for rare and slow-growing plants in terms of conservation. Leaf harvesting has no negative effect on the life cycle of plants and is regarded a sustainable harvesting method. The current findings contrast those of other investigations, which show that roots are the most commonly employed plant portion in ethno-veterinary practices [27]. Cows and buffaloes were the most often medicated animals in the study area, trailed by goats and sheep [23]. Little or no consideration was made of curing dogs or cats. This is likely due to the fact that animals are not commonly kept as pets in rural areas, and non - production animals are thought to be more immune to various diseases than mankind. Productive livestock are also more essential due to their socioeconomic value in the lives of local residents. The bulk of the plants in the area are used to cure various gastrointestinal issues in animals, such as diarrhea, worm ejection, constipation, and so on. It's already been discovered that stomach illnesses are more prevalent in lactating animals, possibly because of poor feed and potable water quality [28].

The maximum level of faithfulness is always achieved by extensively utilized therapeutic plants for species illnesses. Various plants, such as *Allium cepa, Curcuma longa, Punica granatum, Cassia tora*, and others, got the greatest fidelity values in the current research and will be submitted to phytochemical and pharmacological analysis to show their therapeutic potential. In several instances, the process of drug production differed from person to person. Traditional veterinary practitioners prepared the same plant material for the same disease in distinct manners. In the research region, folk practitioners make ethno-veterinary recipes predominantly in powder and decoction form. The most prevalent way of drug recovery, according to Deeba [29], is powdering or boiling. These results are consistent with research undertaken in Pakistan's Malakand valley by Hassan *et al*. [22], but they contradict data from other regions of the world [30]. The majority of the recipes are made utilizing a specific plant combination, but some are made as a concoction, and it is widely thought that the efficacy of the medications can be increased when taken in this manner [31]. Because of the significant frequency of internal disorders in the research field, these recipes are usually consumed orally. In the area, these concoctions are given to cattle with their feed, along with various substances such as sugar, wheat, milk, and so on. Wani and Pant *et al*. [32], Baidya *et al.* [33], Nimblakar *et al*. [34] all describe similar outcomes from other parts of the world. These carriers may be used because they enhance the flavor and medicinal benefits of specific plant treatments [13].

The quantity of drugs to be utilized during the survey was not similar among the respondents. A severe disadvantage of conventional medicinal herbs has been established to be a conflict in ethno-veterinary dose. Only the reported time of recovering of animals in accordance to given recipes was shared by informants. When the animals resume appropriate diet and activity, they will have fully recovered. Other ethno-veterinary investigations undertaken elsewhere have shown similar conclusions [26]. Men had superior awareness of ethno-veterinary practices than women, according to the current investigation. The explanation for this could be that men are favored in knowledge shifts, but women are chosen for family responsibilities in the most of civilizations. This obvious gender disparity reflects women's minimal participation in cattle raising and herd health in India's Shekhawati area. In comparison to the younger generation, older males had significantly more indigenous information, which could be

owing to a disinterest in such traditions. As a result, documenting ethno-veterinary practices is a critical step in preserving such information before it is lost [13].

CONCLUSION

Due of their poor earnings and high costs of western pharmaceuticals, local farmers and nomads in the area use a variety of medicinal herbs to heal their cattle. Native healers are highly skilled in creating herbal mixtures from therapeutic plants. Ethno botanical studies can reveal a lot about the past and present links between plants and traditional communities. It is believed that ethno veterinary medicines would play a larger position in sustainable development and biodiversity protection in the long term. In comparison to western medications, domestically abundant and readily obtainable ethno veterinary medicinal herbs give a less expensive medication. The main constraint is the seasonal availability of some plants, which tribals have learned to store in varied forms for off-season consumption. To design measures for their conservation, it is necessary to assess the current condition of commercially and medicinally significant plants. It is necessary to raise conservation education. Documentation of indigenous plant information could aid in the attainment of goals. In the examined location, gastrointestinal diseases were the most prevalent, hence adequate quality food and water should be provided to animals. Plants with a high-fidelity level should have their phytochemical screening and pharmacological activity investigated further in vitro. Indigenous medicinal plant production has the potential to contribute significantly to the region's economic growth. Native residents must be effectively involved in the appraisal, planning, implementation, and monitoring procedures in order to ensure the long-term protection of the region's natural resources, as they are the finest evaluators of the place. To preserve this information, young people should be encouraged to become interested in ethno-veterinary practices.

Conflict of interests

The authors declare that they have no competing interests.

Acknowledgments

The authors are thankful to the Head, Department of Botany, VBRI college, Udiapur for providing facilities for research work. The authors are also very thankful to the local informants for sharing their valuable knowledge.

LITERATURE CITED

1. Veen SV. 1996. “Sense or nonsense? Traditional methods of animal disease prevention and control in African savannah. *In*: in Ethnoveterinary Research and Development. (Eds) C. M. McCorkle, E. Mathias, and T. W. Schillhorn van Veen. Intermediate Technology Publications, London, UK. pp 338.
2. Lans C, Turner N, Khan T, Brauer G, and Boepple W. 2007. Ethnoveterinary medicines used for ruminants in British Columbia, Canada. *Journal of Ethnobiology and Ethnomedicine* 3: 11. https://doi.org/10.1186/1746-4269-3-11
3. Ganesan S, Chandhirasekaran M, Selvaraj A. 2008. Ethnoveterinary healthcare practices in southern districts of Tamil Nadu. *Indian Journal of Traditional Knowledge* 7(2): 347-354.
4. Rahman CH, Ghosh A, Mandal S. 2009. Studies on the Ethno veterinary medicinal plants used by the tribes of Birbhum district, West Bengal. *Indian Journal of Traditional Knowledge* 33: 333-338.
5. Tariq A, Mussarat S, Adnan M, AbdElsalam NM, Ullah R, Khan AL. 2014. Ethno-veterinary study of medicinal plants in a tribal society of Sulaiman range. *Scientific World Journal* 2014: 127526. doi: 10.1155/2014/127526.
6. Manoj Y, Anupama Y, Ekta G. 2012. Ethno veterinary practices in Rajasthan, India – A review. *International Research Journal of Biological Sciences* 1(6): 80-82.
7. Kapoor BBS, Kishor K. 2013. Shekhawati region of Rajasthan a place of ethnomedicinal plants and its phytochemical studies. *International Journal of Latest Technology in Engineering, Management and Applied Science* 2(8): 93-99.
9. Mishra L, Dixit Y and Singh M. 2014. Studies on ethno-medicinal plants of Shekhawati region, Rajasthan, having hypoglycemic properties. *Indian Journal of Fundamental and Applied Life Sciences* 4(2): 62-66.
10. Katewa SS, Galav PK. 2005. Traditional herbal medicines from Shekhawati region of Rajasthan. *Indian Journal of Traditional Knowledge* 4(3): 237-245.
11. Friedman J, Yaniv Z, Dafni A, Palewitch D. 1986. A preliminary classification of the healing potential of medicinal plants, based on a rational analysis of an ethnopharmacological field survey among Bedouins in the Negev Desert, Israel. *Journal of Ethnopharmacology* 16(2/3): 275-287.
12. Trotter RT, Logan MH. 1986. Informants consensus: a new approach for identifying potentially effective medicinal plants, in Plants in Indigenous Medicine and Diet. (Eds) N. L. Etkin. Redgrave, Bedford Hill, NY, USA. pp 91-112,
13. Meen M, Dudi A, Singh D. 2020. Ethnoveterinary study of medicinal plants in a tribal society of Marwar region of Rajasthan, India. *Journal of Pharmacognosy and Phytochemistry* 9(4): 549-554.
14. Evans WC. 1997. *Trease and Evans Pharmacogonasy*. 14th Edition. W.B. Saunders Company Limited, Singapore.
15. Gupta AK, Varshney ML. 1997. *Practical Manual on Agricultural Chemistry*. 2nd Edition. Kalyani Publishers, New Delhi.
16. Kokate CK, Purohit AP, Gokhale SB. 1998. *Pharmacognosy*. Nirali Prakashan, Pune.
17. Thimmaiah SR. 1999. *Standard Methods of Biochemical Analysis*. Kalyani Publishers, New Delhi.
18. Cappuccino JG, Sherman N. 1996. *Microbiology: A Laboratory Manual*. Benjamin / Cummings Publishing Company, New York.
19. Mhasal SS. 2019. Documentation, credibility assessment and validation of ethno-veterinary practices of Buldhana district Maharasthra. *Ph. D. Thesis*, Swami Ramanand Teerth Marathwada University, India.
21. Kulkarni PH, Apte BK. 2000. *Research Methodology for students of Ayurveda*. Ayurveda Research Institute, Pune.
21. Sadasivam S, Manikam A. 2005. *Biochemical Methods*. 2nd Edition. New Age International (P) Limited, Publishers, New Delhi.
22. Hassan HU, Murad W, Tariq A, Ahmad A. 2014. Ethnoveterinary study of medicinal plants in Malakand Valley, District Dir (Lower), Khyber Pakhtunkhwa, Pakistan. *Irish Veterinary Journal* 67(1): 133-145.
23. Ben´ıtez G, Gonz´alez-Tejero GMR, Molero-Mesa J. 2012. Knowledge of ethnoveterinary medicine in the Province of Granada, Andalusia, Spain. *Journal of Ethnopharmacology* 139(2): 429-439.

24. Appidi JR, Grierson DS, Afolayan AJ. 2008. Ethnobotanical study of plants used for the treatment of diarrhea in the Eastern Cape, South Africa. *Pakistan Journal of Biological Sciences* 11(15): 1961-1963.
25. Kala CP. 2005. Ethnomedicinal botany of the Apatani in the Eastern Himalayan region of India. *Journal of Ethnobiology and Ethnomedicine* 12(2): 121-129.
26. Offiah NV, Makama S, Elisha IL, Makoshi MS, Gotep JG, Dawurung CJ, Oladipo OO, Lohlum AS, Shamaki D. 2011. Ethnobotanical survey of medicinal plants used in the treatment of animal diarrhoea in Plateau State, Nigeria. *BMC Vet. Res*. 7: 36. doi: 10.1186/1746-6148-7-36.
27. Tabuti JRS, Dhillion SS, Lye KA. 2003. Ethnoveterinary medicines for cattle (*Bos indicus*) in Bulamogi county, Uganda: Plant species and mode of use. *Journal of Ethnopharmacology* 88(2/3): 279-286.
28. Luseba D, Merwe DVD. 2006. Ethnoveterinary medicine practices among Tsonga speaking people of South Africa. *Onderstepoort Journal of Veterinary Research* 73(2): 115-122.
29. Deeba F. 2009. Documentation of ethnoveterinary practices in urban and peri-urban areas of Faisalabad, Pakistan. *Ph. D. Thesis*, University of Agriculture, Faisalabad, Pakistan.
30. Dold AP, Cocks ML. 2001. Traditional veterinary medicine in the Alice district of the Eastern Cape Province, South Africa, *South African Journal of Science* 97(9/10): 375-379.
31. Abebe D, Ayehu A. 1993. Medicinal plants and enigmatic health practices of Northern Ethiopia, Berhanena Selam Printing Enterprise, Addis Ababa, Ethiopia. pp 878-885.
32. Wani ZA, Pant S. 2020. Ethnomedicinal study of plants used to cure skin diseases and healing of wounds in Gulmarg Wildlife Sanctuary (GWLS), Jammu & Kashmir. *Indian Journal of Traditional Knowledge* 19(2): 327-334.
33. Baidya S, Thakur B, Devi A. 2020. Ethnomedicinal plants of the sacred groves and their uses by Karbi tribe in Karbi Anglong district of Assam, Northeast India. *Indian Journal of Traditional Knowledge* 19(2): 277-287.
34. Nimbalkar SD, Patil DS, Deo AD. 2020. Ethnoveterinary practices (EVP) for control of ectoparasite in livestock. *Indian Journal of Traditional Knowledge* 19(2): 401-405.