

## Original Article

# Ethnoveterinary knowledge and practices at Tanore Upazila of Rajshahi District, Bangladesh

Md. Touhidul Islam, A. H. M. Mahbubur Rahman\*

Department of Botany, Plant Taxonomy Laboratory, Faculty of Life and Earth Sciences, University of Rajshahi, Rajshahi, Bangladesh

### ABSTRACT

This study reports the surveyed list of medicinal plants used by Santal tribes of Tanore, Rajshahi in ethnoveterinary practices. During the study, interviews were conducted with the help of a semi-structured questionnaire and the guided field walks method. The ethnoveterinary plants traditionally used by Santal tribes were collected and preserved as herbarium specimens by following the standard methods. The identification of plants was further authenticated with the Herbarium, Department of Botany, Rajshahi University, Bangladesh. In this study, a total of 23 plant species under 22 genera and 17 families have been identified as the potential source for treating 14 types of ailments. The objective of the present study was to conduct ethnoveterinary surveys at Tanore Upazila of Rajshahi, Bangladesh. The various ailments treated by the Santals included weakness, low lactation, intestinal problem, diarrhea, stomach trouble, burn, dry cough, chronic ulcerous wounds, disinclination, sickness, constipation, asthmatic problem, urinate trouble of calf and dysentery. Moreover, proper documentation of ethnoveterinary practices leading to further scientific research can also become an important source for discovery of newer and more efficacious drugs.

**Keywords:** Medicinal plants, ethnoveterinary uses, Santals, Rajshahi, Bangladesh

**Submitted:** 11-12-2017 **Accepted:** 10-01-2018 **Published:** 29-03-2018

## INTRODUCTION

Nature is provided with a lot of herbal medicinal plants which play a major part in the treatment of diseases. Plants are considered as the significant and elemental sources of medicinal traits. Medicinal plants form the richest entity in medicines, food supplements, nutraceutical, pharmaceutical, and chemical industries for manufacturing drugs.<sup>[19]</sup> Ethnoveterinary medicine is the science that studies the beliefs, knowledge, techniques, methods, and practices used in the care and promotion of animal health.<sup>[6]</sup> Some factors, such as the increased cost of veterinary services and difficulty of acquiring synthetic drugs, have contributed to the interest in developing this science, especially regard to the use of phytotherapy.<sup>[18]</sup> Ethnoveterinary knowledge is acquired by communities over many years and passed between generations through oral tradition. Today, with rapid cultural changes, this knowledge is being lost, necessitating its scientific

documentation<sup>[17]</sup>. There have been many ethnoveterinary surveys from around the world regarding the use of plants in therapeutic protocols.<sup>[2,7,8,11,12,15,16,23-26]</sup>

Plants with curative properties enjoy the utmost consideration in indigenous systems of medicine throughout the world. This is especially true in the developing countries, where imported drugs are very expensive and are, therefore, inaccessible to the vast majority of the population.<sup>[11]</sup> The searches for drugs and dietary supplements derived from plants have accelerated in recent years. Pharmacologists, microbiologists, botanists, and natural-products chemists are combing the earth for phytochemicals and lead that it could be developed for the treatment of various diseases. Knowledge of the curative properties of specific plants is an accomplished art. This art is still maintained in Bangladesh, especially in rural areas. Bangladesh is endowed with more than 5000 plant species, and about 1000 of them is medicinally important.<sup>[9]</sup>

**Address for correspondence:** A. H. M. Mahbubur Rahman, Department of Botany, Faculty of Life and Earth Sciences, University of Rajshahi, Rajshahi, Bangladesh. Phone: 880 721 751485. Mobile: 88 01714657224.  
E-mail: drrahmanahmm@ru.ac.bd

In this context, it is important to conduct studies that document the ethnoveterinary knowledge of Santal communities, as rapid urbanization, the dominance of allopathic medicine and the acculturation of the population may contribute to the disappearance of such knowledge. In addition, popular knowledge can provide important information for the selection of natural alternatives for treating animal diseases and contribute to the discovery of new drugs. Therefore, the purpose of this study was to document and analyze the ethnoveterinary knowledge of the Santal community at Tanore Upazila of Rajshahi District, Bangladesh.

## MATERIALS AND METHODS

### Study Area

Tanore is an Upazila of Rajshahi District in the Division of Rajshahi, Bangladesh. Tanore Upazila area is 293.37 km<sup>2</sup> located in 30 km northwest position from Rajshahi District. It is bounded by Nachole Upazila on the northwest, on the north Niamatpur, on the south Godagari, on the west Nawabganj sadar, on the northeast Manda and on the east Mohanpur Upazila. The climate of this area is generally tropical wet and dry climate, characterized by high temperatures, heavy monsoon, moderate rainfall, and high humidity. The hot season commences early in March and continues till the middle of July. The maximum mean temperature observed is about 32–36°C during the months of April, May, June, and July and the minimum temperature recorded in January is about 7–16°C. The highest rainfall is observed during the months of monsoon. The annual rainfall in the district is about 1,407 mm.<sup>[4]</sup>

### Data Collection

A total of 19 field trips were made for the documentation of ethnoveterinary knowledge during April 2016–March 2017. During the field interview, the information was noted in the documentation data sheet. A total of 127 Santal people having an age range 24–73 years were interviewed using the semi-structured interviewed method.<sup>[3]</sup> Professionally they were peasant, day labor, farmer, housewives, small shopkeepers, etc. Among them, 58 were female and rest 69 were male. Regular field studies were made in the study area during the period. The information about the plants used for various diseases was gathered through interviews and discussion with the elderly people, medicine men and traditional medical practitioners were also consulted. Plant specimens were collected with flowers and fruits and processed using standard herbarium techniques.<sup>[3]</sup>

### Plant Identification

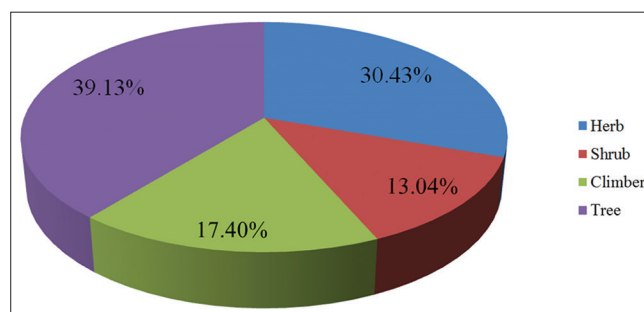
The identification of plant specimens was achieved through the help of taxonomic experts and by comparison with the identified herbarium specimens and available literature.<sup>[1,10,14,20,22]</sup> The voucher specimens are deposited at the Herbarium, Department of Botany, Rajshahi University, Bangladesh, for future [Figure 1].

## RESULTS AND DISCUSSION

In this study, a total of 23 plant species under 22 genera and 17 families have been identified as potential source for treating 14 types of ailments. The scientific names of the species along with families, vernacular names, part(s) used, veterinary uses, doses, and mode of preparation are recorded [Table 1]. Out of these plants species, 30.43% belonged to herbs, 39.13% trees, 13.04% shrubs, and 17.40% climbers [Figure 2]. Use of plant parts as medicine shows variation. Leaves 30.43% are the leading part used in a majority of medicinal plants followed by whole plant 13.04%, bark 17.39%, seed 17.39%, bulb 4.35%, root 13.04%, stem 13.04%, latex 4.35%, and rhizome 4.35% [Figure 3]. The collected information is comparable with the result of other studies in Bangladesh and abroad. A total of 22 genera and 22 species were recorded in Northern Ethiopia.<sup>[26]</sup>



**Figure 1:** Interview with Santal people in the study area



**Figure 2:** Habit of the recorded plant species in the study area

**Table 1: Recorded plant species used by the Santals for the treatment of veterinary diseases**

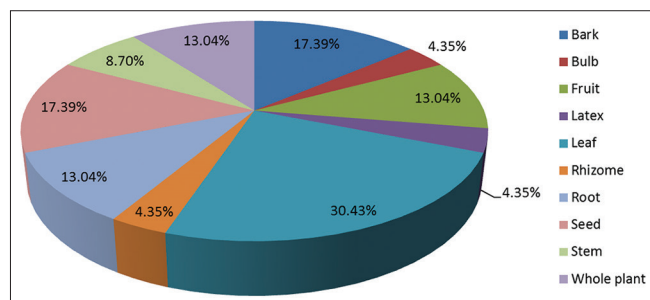
Botanical name	Local name	Family name	Habit	Part (s) used	Veterinary use	Mode of preparation
<i>Abrus precatorius</i> L.	Kuch	Fabaceae	Climber	Leaf	Urine trouble of calf	Tendrils use as a garland
<i>Acacia nilotica</i> (L.) Del.	Babla	Mimosaceae	Tree	Bark	Intestinal problem	Decoction (100 ml) stem bark is administered twice daily for 4 days against intestinal problem
<i>Amaranthus spinosus</i> L.	Katanotey	Amaranthaceae	Herb	Whole plant	Low lactation (cow)	Whole plant boiled with <i>Colocasia esculenta</i> tender leaves is fed to cow for few days
<i>Argemone mexicana</i> L.	Shialkanta	Papaveraceae	Herb	Latex seed	Chronic ulcerous wounds	Pale milk of the plant and oil from seeds are applied once daily for 15 days
<i>Artocarpus heterophyllus</i> Lamk.	Kanthal	Moraceae	Tree	Fruit	Weakness	Unripe fruit used for good health
<i>Bambusa longispiculata</i> Gamble	Baash	Poaceae	Tree	Leaf bark	Dysentery (loose motion)	Green layer of stem fed to cattle covered with it leaves
<i>Boerhavia diffusa</i> L.	Punarnava	Nyctaginaceae	Herb	Whole plant	Constipation	Whole plant is crushed through to extract juice and the juice fed with table salt at 8 h intervals
<i>Capsicum frutescens</i> L.	Morich	Solanaceae	Shrub	Fruit	Burn	Paste of fruits applied on burned area
<i>Chenopodium album</i> L.	Bothua shak	Amaranthaceae	Herb	Whole plant	Lactation	Whole plant directly feeding cow's for promotes lactation
<i>Diospyros malabarica</i> (Desr.) Kostel.	Gaab	Ebenaceae	Tree	Leaf	Dysentery (loose motion)	Fed tender leaves twice daily for 3 days
<i>Ficus hispida</i> L. f.	Khoksa	Moraceae	Tree	Leaf	Dry cough	Fresh leaves are treated orally 3 times daily for 4 days
<i>Ficus racemosa</i> L.	Jagg dumur	Moraceae	Tree	Leaf	Diarrhea and dysentery (loose motion)	Fresh leaves are treated orally until cure
<i>Lagenaria siceraria</i> (Mol.) Stan.	Lau	Cucurbitaceae	Climber	Leaf fruit	Lactation	Tender leaves and fruits are fed for lactation

(Contd...)

Table 1: (Continued)

Botanical name	Local name	Family name	Habit	Part (s) used	Veterinary use	Mode of preparation
<i>Mangifera indica</i> L.	Aam	Anacardiaceae	Tree	Seed bark root	Low milk flow	Mixer of seed, stem bark and root paste (1:1:1) is administered once daily for 10 days to cure low milk flow
<i>Moringa oleifera</i> Lam.	Sojne	Moringaceae	Tree	Bark seed root	Low milk flow	Mixer of stem bark, seed and root paste (1:1:1) is administered once daily for 10 days against poor milk flow
<i>Piper nigrum</i> L.	Golmorich	Piperaceae	Climber	Fruit	Low milk flow	Fruits (20 mg) with grinded black gram paste are administered once daily for 10 days
<i>Ricinus communis</i> L.	Verenda	Euphorbiaceae	Shrub	Seed	Sickness	Feed the cattle with 150 ml of castor oil and feed the juice extract of betel leaves, ginger, pepper, clove and garlic for 3 days against sickness
<i>Saccharum officinarum</i> L.	Aakh	Poaceae	Shrub	Stem	Urinate problem	Jaggery fed to cattle mixed with water to cure urinate problem
<i>Streblus asper</i> Lour.	Sheora	Moraceae	Tree	Leaf	Lactation (goat)	Tender leaf is fed daily
<i>Tagetes patula</i> L.	Gandaful	Asteraceae	Herb	Root	Asthmatic problem	Root paste mixed with a glass of water then filter it and orally treated to horse regularly to cure asthmatic problem
<i>Tinospora cordifolia</i> Willd.	Guloncho	Menispermaceae	Climber	Stem	Disinclination	Stem decoction (50 g) is administered with water once daily for 3 days with empty stomach
<i>Urginea indica</i> (Roxb.) Jessop.	Bonpiaz	Liliaceae	Herb	Bulb	Stomach trouble	Paste of bulb and <i>Zingiber officinale</i> rhizome mixed with water and orally treated twice a day for 2 days
<i>Zingiber officinale</i> Roscoe.	Ada	Zingiberaceae	Herb	Rhizome	Sickness	Feed the cattle with 150 ml of castor oil and feed the juice extract of betel leaves, ginger, pepper, clove and garlic against 3 days sickness





**Figure 3:** Recorded plant parts used for veterinary purpose

A total of 43 species belonged to 41 genera and 31 families were recorded in Pabna District, Bangladesh.<sup>[2]</sup> A total of 57 medicinal plants and 37 families were recorded in Dinajpur District, Bangladesh.<sup>[12]</sup> A total of 51 plant species and 17 families were recorded in Bagerhat District, Bangladesh.<sup>[23]</sup> A total of 44 plant species and 32 families were recorded in Jessore District, Bangladesh.<sup>[15]</sup> A total of 56 species belonged to 49 genera and 35 families were recorded in Eastern Amazon, Brazil.<sup>[24]</sup> A total of 73 medicinal plants belonging to 70 genera and 45 families were recorded in Uttarakhand, India.<sup>[21]</sup> A total of 53 species belonging to 37 families was recorded in Chapai Nawabganj District, Bangladesh.<sup>[13]</sup> So far the information available, no published data recorded on the ethnoveterinary medicinal plants used in Tanore Upazila of Rajshahi District, Bangladesh.

## CONCLUSION

The present study contributed to the establishment of an inventory of plants used in ethnoveterinary practices in the study area. Future, phytochemical and pharmacological studies are needed to confirm the efficacy and safety of the identified plants, enabling communities to use them in a more economic, effective, and safe manner.

## ACKNOWLEDGMENTS

The authors are grateful to the Santal community of Tanore upazila of Rajshahi district, Bangladesh, for their cooperation and help during the research work.

## REFERENCES

- Ahmed ZU, Begum ZN, Hassan MA, Khondker M, Kabir SM, Ahmad M, *et al*, editors. Encyclopedia of Flora and Fauna of Bangladesh. Vol. 6-10. Bangladesh, Dhaka: Angiosperms; Dicotyledons. Asiat. Soc; 2008-2009. p. 6-10.
- Alam J, Ghosh GP, Amin MN, Islam R. An inventory of medicinal plants used in traditional veterinary medicine practices in pabna region, Bangladesh. *Plant Environ Dev* 2014;3:1-5.
- Alexiades MN, editor. Selected Guidelines for Ethno Botanical Research: A Field Manual. New York: The New York Botanical Garden; 1996.
- BBS (Bangladesh Bureau of Statistics). Statistical Year Book of Bangladesh. 23<sup>rd</sup> ed. Dhaka: Bangladesh Bureau of Statistics, Planning Division, Ministry of Planning Government of Peoples Republic of Bangladesh; 2011.
- Banumathi B, Vaseeharan B. A report on medicinal plants used in ethno veterinary practices of toda tribe in the Nilgiri Hills. *J Vet Sci Technol* 2015;6:245.
- Barboza RR, Souto WM, Mouras JS. The use of zootherapeutics in folk veterinary medicine in the district of Cubati, Paraiba State, Brazil. *J Ethnobiol Ethnomed* 2007;3:1-14.
- Benitez G, Gonzalez-Tejero MR, Molero-Mesa J. Knowledge of ethnoveterinary medicine in the province of Granada, Andalusia, Spain. *J Ethnopharmacol* 2012;139:429-39.
- Farook Z, Iqbal Z, Mustaq S, Muhammad G, Iqbal MZ, Arshad M. Ethnoveterinary practices for the treatment of parasitic diseases in livestock in Cholistan desert (Pakistan). *J Ethnopharmacol* 2008;118:213-9.
- Ghani A. Medicinal Plants of Bangladesh: Chemical Constituents and Uses. Dhaka: Asiatic Society of Bangladesh; 1998. p. 1-33.
- Hooker JD. Flora of British India. Vol. 1-7 (reprint 1961). London, U.K: L. Reeve and Co. Ltd.; 1875.
- Harun-or-Rashid MD, Tanzin R, Ghosh KC, Jahan R, Khatun A, Rahmatullah M. An ethnoveterinary survey of medicinal plants used to treat cattle diseases in Birishiri area, Netrokona District, Bangladesh. *Adv Nat Appl Sci* 2010;4:10-3.
- Islam MA, Yeasmin M, Rahmatullah M. Ethnoveterinary practices among folk medicinal practitioners of three randomly selected villages of Dinajpur district, Bangladesh. *Am Eur J Sustain Agric* 2013;7:75-84.
- Jamila J, Rahman AH. An ethnoveterinary survey of traditional medicinal plants used by the santhal tribe at Jamtala Village under Sadar Upazila of Chapai Nawabganj District, Bangladesh. *Acta Velit* 2015;1:54-69.
- Kirtikar KR, Basu BD. Indian Medicinal Plants. Vol. 1-4. Allahabad, Jayyed Press, New Delhi, India: Lalit Mohan Basu; 1987.
- Mamun AA, Tumpa SI, Hossain MI, Ishika T. Plant resources used for traditional ethno veterinary phytotherapy in Jessore District, Bangladesh. *J Pharm Phytochem* 2015;3:260-7.
- McGaw LJ, Eloff JN. Ethnoveterinary use of southern African plants and scientific evaluation of their medicinal properties. *J Ethnopharmacol* 2008;119:559-74.
- Mathias E. Introducing Ethnoveterinary Medicine. Bergisch Gladbach, Berlin, Germany; 2001.
- Monteiro MV, Mevilacqua CM, Camurca-Vasconcelos AL. Metodologia aplicada a levantamentos etnoveterinarios. *Vet Faco* 2011;9:76-87.
- Ncube NS, Afolayan AJ, Okoh AI. Assessment techniques of antimicrobial properties of natural compounds of plant origin: Current methods and future trends. *Appl Food Biotechnol* 2008;7:1797-806.
- Pasha MK, Uddin SB. Dictionary of Plant Names of Bangladesh (Vascular Plants). Chittagong, Dhaka, Bangladesh: Janokalyan Prokashani; 2013.
- Phondani PC, Maikhuri RK, Kala CP. Ethnoveterinary uses of medicinal plants among traditional herbal healers Alaknanda Catchment of Uttarakhand, India. *Afr J Tradit Complement Altern Med* 2010;7:195-06.

22. Prain D. Bengal Plants. Vols. 1-2. Calcutta, India: Botanical Survey of India; 1963.
23. Rahmatullah M, Mollik MA, Alam MJ, Ahmed B, Jahan FI, Sintaha M, *et al.* An ethnoveterinary survey of medicinal plants used by folk medicinal practitioners to treat cattle diseases in randomly selected areas of Bagerhat District, Bangladesh. *Am Eur J Sustain Agric* 2010;4:386-96.
24. Ritter RA, Monteiro MV, Monteiro FO, Rodrigues ST, Soares ML, Silva JC, *et al.* Ethnoveterinary knowledge and practices at Colares Island, Para state, eastern Amazon, Brazil. *J Ethnopharmacol* 2012;144:346-52.
25. Sharma R, Manhas RK, Magotra R. Ethnoveterinary remedies of diseases among milk yielding animals in Kathua, Jammu and Kashmir, India. *J Ethnopharmacol* 2012;141:265-72.
26. Yirga G, Teferi M, Gidey G, Zeraburk S. An Ethnoveterinary Survey of Medicinal Plants Used to Treat Livestock Diseases in Seraharti-Samre District. Northern Ethiopia. *Afr J Plant Sci* 2012;6:113-9.



This work is licensed under a Creative Commons Attribution Non-Commercial 4.0 International License.