International Journal of Sciences & Applied Research

www.ijsar.in

Traditional Ethno-Veterinary practices in Bhandara district (M.S.) India

Gadpayale J.V., Khobragade D.P., Chaturvedi A.A.*

Department of Botany, S. N. Mor College of Arts, Commerce & Smt. G. D. Saraf Science College, Tumsar (M.S.), India - 441 912.

Correspondence Address: * Chaturvedi A.A., P.G.T. Department of Botany, University Campus, RTM University, Nagpur - 440 033

Abstract

The present communication deals with the documentation of Ethno-veterinary medicinal plants used by the traditional healers in Bhandara district, Maharashtra, India. Ethno veterinary information was gathered through individual interviews and observations among the tribal peoples of study area. A total of 41 species of Ethnoveterinary medicinal plants belongs to 27 families and 39 genera were recorded in the study with the help of nine Ethno veterinary traditional healers. This information suggests the documentation of the medicinal plants and associated indigenous knowledge can be used for conservation and sustainable use of medicinal plants in the area and for validation of these plant preparations for veterinary treatment.

Keywords: Ethnoveterinary medicinal plants, Domestic animals, Bhandara district

Introduction

Ethno veterinary medicine was practiced as early as 1800 B.C. at the time of King Hamurabi of Babylon who formulated laws on veterinary fees and charged for treating cattle and donkeys (Schillhorn van Veen, 1996). Many traditional medicines have been abandoned following the discovery of the modern chemotherapy. But for more than a decade now Ethnoveterinary medicine has experienced a revival and several reports have been published. This growing interest in traditional practices had been encouraged by the recognition of some efficacious Ethnoveterinary medicinal products. Ethnoveterinary medicine often provides cheaper options than comparable western drugs, and the products are locally available and more easily accessible. In the face of these and other factors there is increasing interest in the field of Ethnoveterinary research and development (Zschocke et al., 2000; Masika et al., 2000; Tabuti et al., 2003; Yineger et al., 2007; Kone and Atindehou, 2008).

Resource-poor livestock farmers all over the world have limited access to modern disease prevention and treatment practices particularly in the areas with inadequate health coverage facilities. They frequently depend on traditional knowledge for the management of animal health problems and to improve their productivity. Despite the fact that Ethnoveterinary medicine has been very crucial for the animal healthcares of most developing countries, it has not yet been well documented and much effort is needed in research and integration activities in these countries (Yineger et al., 2007). The possible benefit of plant derived medications

constitutes a rewarding area of research, particularly in countries such as India which have a rich biodiversity of natural plant resources coupled with a high prevalence and variety of infectious diseases. The characteristics, sophistication, and intensity of the Ethnoveternary systems differ greatly among individuals, societies, and regions. Hence, documentation of Ethnoveternary medicine from regions having a rich ethnographic and biodiversity setting would be of great significance.

Most of the reports concern with Ethnoveterinary practices of tribal people in India for the treatment of various diseases in livestock as Rajan et al., (1997), Girach et al., (1998); Jain, Reddy et al., (1999); S.K., (2003); Geetha et al., (2006), Kiruba et al., (2006) Mini, et al., (2007); Harsha et al., (2005); Ganesan et al., (2008), Satya et al., (2009); Yadhav, (2009); Rahman et al., (2009), for the treatment of different types of diseases in livestock. Some ethnobotanist of works on this aspect in Maharashtra regarding the particular district as M.V. Patil (2001) Ethno veterinary herbal medicines from Nasik District (Maharashtra), Rothe, et al., (2005) Ethno-veterinary medicinal plants study from Melghat tribal region of Satpuda range Ethno-veterinary medicinal preparations of tribals from Shirpur tahasil, Dhule district, by Patil et al., (2013) while Gupta et al., (2009) worked on ethno-medicinal plants of the study area but still there is no any strong reference in concern with ethno veterinary studies of the Bhandara district hence the present study was conducted to identify, collect and document the Ethno veterinary medicinal plants used of Bhandara district and their utilization for primary health care of animals treatments for different ailments.

Materials and methods

Study area: The present study was conducted among the Bhandara district tribal people who inhabit the foot hills, Maharashtra, India (Fig. 1).

Bhandara district is an important district of Maharashtra which has striking landscapes dotted with hillocks, lakes, temples and forts etc situated on the bank of Wainganga River. It lies between the latitudes 20^0.39' and 21^0.38' North and longitudes 79^0.27' and 80^0.42' East and has an area of 3716.65 sq. kilometer. The present study was conducted at twelve villages, which are located very close to forest found in study area. Each village has around 45-90 houses and some villages are not having any transportation facilities. The people of the study area are basically agriculturists and most of them are having domestic animals such as cow, goat, sheep, buffalo and bulls. But the area has not been supported with the veterinary colleges, hospitals and any such dispensaries. The villagers in the block are usually goes to the nearby blocks of the district to treat their animals. In case of emergency the Ethnoveterinary healers of the study area offer some necessary indigenous treatments with medicinal plants.

Data Collection

Field trips ranging from 3 days to a week were made in the study area in every month of the year of study (June 2010 to November 2012) among the tribal people in Bhandara district. The major livelihood of these tribals are cattle farming, agriculture, collection of fuel-wood and forest resources such as herbal medicines, honey and some edible fruits and tubers from the nearby forests. The tribal's communities are rich in populations which are spread along the contiguous hill ranges of study area such as Ravanwadi, Purakabodi, Pagora, Nimgaon, Kharashi, and Gaymuk hills. These hills were occupied by different types of ethnic communities, with the predominant population of Gond, Pardhi tribes.

Ethno veterinary data were collected from 15 resource persons (all belonged to the male group with average age of 65 years) of the study area who have much knowledge on medicinal plants with semi structured

Cassia fistula L, ***Abrus precatorius*** L, ***Woodfordia fruticosa*** (L.) Kurz.

Gardenia resinifera Linn. F . ***Abutilon indicum*** (L.) Sweet, Hort. Brit. ***Wattakaka volubilis*** (L. f.) Stapf.

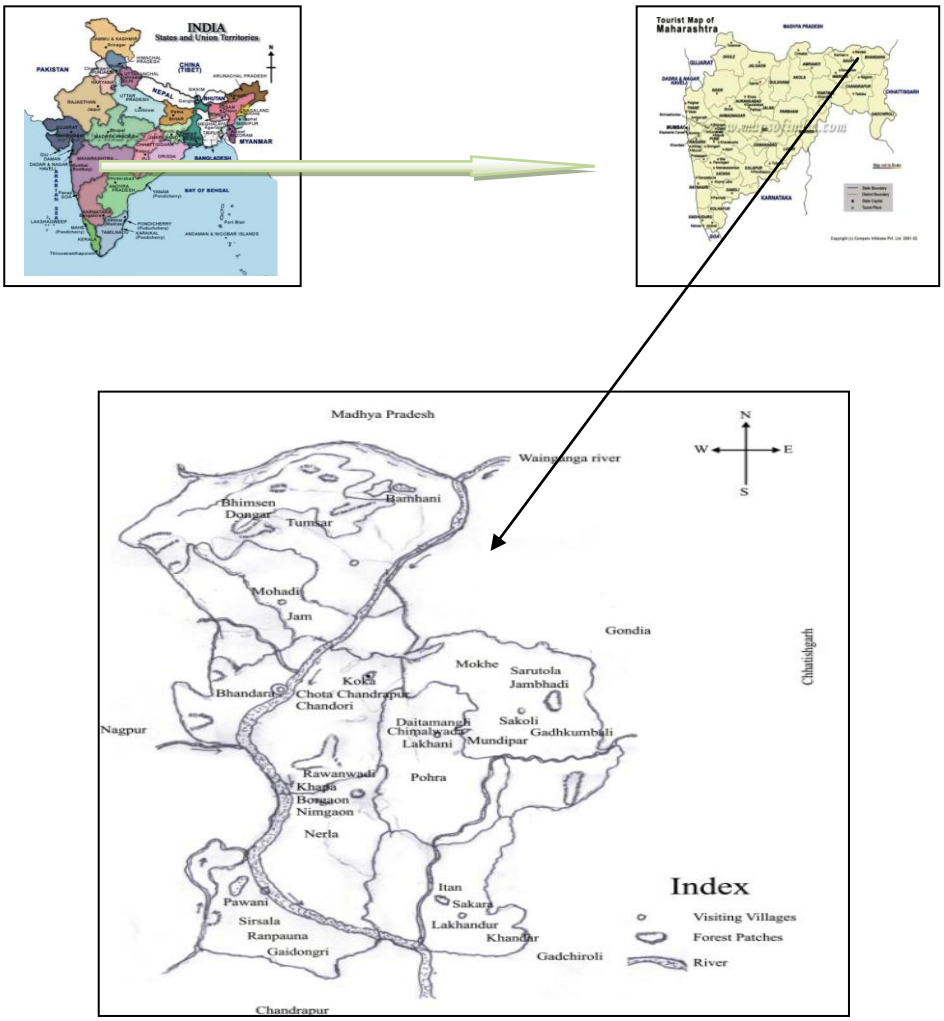

Fig 1: Geographic position and visited villages of Bhandara District (M.S.), India

interviews. The interviews were conducted in the local language, i.e., *Marathi*. Ethnoveterinary information included with the local name of the particular plant, parts utilized Ethnoveterinary uses and methods of preparation and administration. The collected Ethnoveterinary information was recorded on field note books and plants with the usual ethno-medical botanical method (Jain 1987), were plant specimens are identified by using established flora of Maharashtra Vol. I & II (Singh N. P. and S. Karthikeyan, 2000). The vouchers specimens were deposited at the herbarium of Department of Botany, S. N. Mor College Tumsar dist: Bhandara.

Observations

The present work enumerate the correct botanical name, family, local name plant, part used, method of preparation and mode of administration of the drug against the ailments and the plants species are arranged alphabetically.

1. ***Abutilon manihot*** (L.) Medik (**Family**: - Malvaceae **Local name**: - Ranbhendi), Nimgaon, **Specimen Voucher No**.- JVG- 412

Powder from 2-3 dried fruits powder is mixed in a cupful of Nilgiri (*Eucalyptus globulus*) oil and given orally twice a day for 3-4 days for curing blood dysentery.

2. ***Abutilon indicum*** (L.) Sweet, Hort. Brit. (**Family**: - Malvaceae **Local name**: - Petari, Sakuli), Ravanwadi, Nimgaon, **Specimen Voucher No**.- JVG-242

Leaves ground with butter milk and the extract given to cure dysentery.

3. ***Abrus precatorius*** L. (**Family**: - Fabaceae **Local name**: -Gunja), Pagora, **Specimen Voucher No**.- JVG-321

Leaf paste is applied on affected places to treat swellings while the small amount of seed powder is given in the stomach problems.

4. ***Acacia nilotica*** (L) Willd. ex. Delile. (**Family**: - Mimosaceae **Local name**: - Babhul), Khapa, Common throughout the district, **Specimen Voucher No**. - JVG-1112.

A handful of fresh and healthy leaves are crushed in a cupful of curd and given with one chicken egg white once a day for 5-6 days to cure mouth ulcer in oxen and buffaloes.

5. ***Achyranthes aspera*** L. (**Family**: - Amaranthaceae **Local name**: -Aghada), Nimgaon, **Specimen Voucher No**. - JVG-765.

Leaf is ground and the filtered juice is used to pour in eyes to get relief from watering in eyes as well as to treat the ear problems.

6. ***Adhatoda vasica*** Nees (**Family**: - Acanthaceae **Local name**: -Adulsa), Mundipar, **Specimen Voucher No.** - JVG-876.

Decoction of leaf and stem are given to treat fever.

7. ***Andrographis paniculata*** Nees (**Family**: - Acanthaceae **Local name**: - Bhuineemb), Kitali, Nerla, **Specimen Voucher No**.- JVG-334

Decoction of whole plant is used to treat fever and cough

8. ***Anogeissus latifolia*** (Roxb. *ex* DC.) Wall. *ex* Guill. & Perr. (**Family**: - Combretaceae Local **name**: - Dhawda), Common in forest of district, **Specimen Voucher No**. - JVG-567.

About 50 gms of fresh stem bark is boiled with 1-2 tsp of Nilgiri (*Eucalyptus globulus*) oil in 2-3 glassful of water for 2-3 minutes and the decoction is given orally two times a day for a period of 3-4 days to arrest dysentery.

9. ***Aristolochia bracteolate*** Lam (**Family:** - Aristolochiaceae **Local name**: - Kidmari), Nimgaon, Pagora, Dongargaon **Specimen Voucher No**.- JVG-132

Leaves are heated with gingerly oil and applied on affected places to cure skin infections and wounds. Leaf is made into a paste along with pepper and given to cure insect bite.

10. ***Asparagus racemosus*** **Willd** (**Family:** - Liliaceae **Local name**: - Shatavari, Marbat), Nimgaon, Purkabodi, Koka **Specimen Voucher No**. - JVG-980.

Two to three tsp of root powder is mixed in about 150-200 gm of safflower cake and the mixture obtained is given twice a day for 12-15 days to the cattle to improve lactation period and quality in cows and buffaloes

11. ***Azadirachta indica*** A. Juss. (**Family:** - Meliaceae **Local name**: - Kadunimb), Nimgaon, almost common **Specimen Voucher No**.- JVG-165

The leaves are used directly for treating the high fever in domestic animals while the paste of leaves and bark is applied on the skin for the worm infection and skin problems**.**

12. ***Catharanthus roseus*** G. Don. (**Family**: - Apocynaceae **Local name**: - Jagannath, Sadafuli), Nimgaon, Planted in garden **Specimen Voucher No**. - JVG-435.

Paste of about 20-30 gm of fresh leaves in a cupful of water is mixed with a small amount of lemon fruit juice and applied externally at the site of bitten region of the body once a day for 6-8 days for healing of wounds due to dog bite.

13. ***Calotropis gigantea*** (L.) W.T. Aiton (**Family:** - Asclepediaceae **Local name**: - Rui), Nimgaon, **Specimen Voucher No**.- JVG-782.

Root is kept in nostrils for few minutes to get relief from running nose while the leaf latex is used to cure the wound and skin problems.

14. ***Corallocarpus epigaeus*** (Rottl.) C.B.Cl. (**Family:** - Cucurbitaceae **Local name**: - Mungus kand), Nimgaon, Garada **Specimen Voucher No**.- JVG-300.

The juice extracted from about 50 gm fresh tuber pieces in a cupful of water is given orally to goats and cows twice a day for a period of 3-4 days to destroy and expel out tape worms.

15. ***Cardiospermum halicacabum*** L. (**Family:** - Sapindaceae **Local name**: - Kapalphuti), Nimgaon, **Specimen Voucher No**. - JVG-439.

Leaves are ground with pepper and garlic, made into a paste and given to cure fever.

16. ***Cassia fistula*** L. (**Family:** - Caesalpiniaceae **Local name**: - Bahava), Nimgaon, **Specimen Voucher No**. - JVG-879.

Stem bark is ground with pepper and garlic and the mixture is given to cure fever while the legume (fruit) is used to treat the digestive problems in cats and goats.

17. ***Cassia tora*** L. (**Family:** - Caesalpiniaceae **Local name**: - Tarota), Nimgaon, Common **Specimen Voucher No**.- JVG-880.

Seed is mixed with water and ground into paste and applied topically to cure skin diseases.

18. ***Cissus quadrangularish*** L. (**Family:** - Vitaceae **Local name**: - Haddijod), Mohgaon, Gaymukh, Kharashi **Specimen Voucher No**.- JVG-298.

The fresh pieces of stem are used to treat the bone fracture and muscular pain in goats and cows as well as bulls and buffaloes.

19. ***Citrullus colocynthis*** L. (**Family:** - Cucurbitaceae **Local name**: - Indravan), Nimgaon, Khapa, Sonegon **Specimen Voucher No**.- JVG-398.

Root is ground with water and the decoction obtained is given to cure cough. Dry Fruit powder is given in the treatment of diarrhea and dysentery in goats, cows & etc.

20. ***Cissampelos pareira*** L (**Family:** - Menispermaceae **Local name**: - Pahadvel), Jambhali, Nimgaon, **Specimen Voucher No**.- JVG-102.

An extract from young shoots and tender leaves in warm water is given internally with a pinch of rock salt and also applied topically on the bitten region of goats and sheep twice or thrice a day for relieving pains of scorpion bite.

21. ***Clerodendron serratum*** (Linn.)Moon (**Family**:- Verbenaceae **Local name**: -

Ranasuta), Nimgaon, **Specimen Voucher No**.- JVG-378.

Approximately 100 gm powder from shade dried roots is soaked in half litter warm water overnight and the extract is boiled on next day morning for 3-4 minutes to obtain decoction which is applied externally on womb of cows once a day at night for 5-8 days to increase placental contraction during calving.

22. ***Curcuma aromatic*** (**Family:** - Zingiberaceae **Local name**: - Halad), Cultivated, Nimgaon, **Specimen Voucher No**.- JVG-997

Rhizome in powder form is applied on the wounds due to cut or any skin problem due to infection.

23. ***Dalbergia latifolia*** Roxb. (**Family:** - Fabaceae **Local name**: - Shisham, Bivala), Common, **Specimen Voucher No**.- JVG-657

Stem bark is ground with garlic and pepper and the mixture is given for the animals which are lazy in grazing.

24. ***Datura metel*** L. (**Family:** - Solanaceae **Local name**: - Dhotra), Kharbi, **Specimen Voucher No**.- JVG-455.

Roasted fruits are given once a day till the dysentery and cough is cured.

25. ***Gardenia resinifera*** Linn. F (**Family:** - Rubiaceae **Local name**: - Dhikemali), Koka, Nerala, Purakabodi, Nimgaon & Common in forest **Specimen Voucher No**.- JVG-119.

Secretion of the plant (in the form of gum) is warmed and applied for the treatment of skin problems particularly found on the mouth and legs which is commonly known as Thondekuri.

26. ***Leonotis nepetaefolia*** (L.) R. Br. (**Family:** - Lamiaceae **Local name**: - Dipmal), Common along the agricultural field, **Specimen Voucher No**.- JVG-824.

Paste from certain amount of semi-ripen fruits is mixed with a pinch of common salt and fed to the age old female goats and sheep to achieve successful conception.

27. ***Madhuca langifolia*** (Koen.) Mac. Bride. (**Family:** - Sapotaceae **Local name**: - Moha), Moderate in district forest, **Specimen Voucher No**. - JVG-611.

150-200gms of entire parts of the plant is crushed in a glassful of water and the extract obtained is fed to the cattle twice a day up to 3-5 days to improve musculature in oxen.

28. ***Mimosa pudica*** L. (**Family:** - Mimosaceae **Local name**: - Lajalu, lajari), Nimgaon, Koka **Specimen Voucher No**. - JVG-776.

Leaf is ground with pepper, garlic, and onion then fed to barren cows during fever.

29. ***Pergularia daemia*** (Forsk) Chiov (**Family:** - Asclepediaceae **Local name**: - Utaranvel), Common along road side **Specimen Voucher No**. - JVG-204.

Certain quantity of decoction from fresh and young leaves made in water is mixed in ground nut cake (fodder) and same preparation is fed to cows after calving to relieve post- natal pains.

30. ***Pongamia pinnata*** (L.) Pierre (**Family:** - Fabaceae **Local name**: - Karanji), Nimgaon, **Specimen Voucher No**. - JVG-503.

Leaf is ground with pepper and given to cure fever. Decoction of stem bark is given orally to treat dysentery.

31. ***Rumex nepalensis*** Spreng (**Family:** - Polygonaceae **Local name**: - Ranpalak), Mostly found in moist habitat in the district, **Specimen Voucher No**. - JVG-313.

The root juice is used as an antidote to food poisoning in cattle. The fresh root is pounded and the extract is given orally a small quantity about 6 ml. instilled into nose.

32. ***Ricinus communis L.*** (**Family:** - Euphorbiaceae **Local name**: - Erandi), Chowa, Virali, Nimgaon, **Specimen Voucher No**.- JVG-450

The leaf powder is rubbed twice a day on the body of animals to cure the wound

while the fresh 50 gm leaves are given to the goat and sheep to get relief from the indigestion and gas trouble.

33. ***Syzygium cumini*** (L.) Skeels (**Family:** - Myrtaceae **Local name**: - Jambhul), Nimgaon, Kothurna, Pagora **Specimen Voucher No**. - JVG-699.

Stem bark is mixed with curd and made into a paste and given to cure dysentery. An extract from semi-ripen fruits is mixed in certain proportion in suitable fodder and same preparation is fed to bulls to attain maximum and healthy growth with higher vitality.

34. ***Sesbania grandiflora*** (L.) Poiret (**Family:** - Fabaceae **Local name**: - Heti), Mohadi, Tumsar, Nimgaon, **Specimen Voucher No**. - JVG-839.

Certain amount of seed powder is mixed with wheat flour during chapatti preparation and same chapatti are fed regularly to male buffaloes and oxen once daily on regular basis early in the morning for 2-3 months to increase and maintain sexual potency and strength.

35. ***Salanum xanthocarpum*** Schrad & Wend (**Family:** - Solanaceae **Local name**: - Dorali), Common in west land, Nimgaon, **Specimen Voucher No**. - JVG-444.

5-6 fresh unripe fruits are boiled with sufficient amount of water for 2-3 minutes and the decoction is given orally to the cows twice daily up to 4-5 days for relieving fever.

36. ***Tamarandus indica*** (**Family:** - Mimosaceae **Local name**: - Chinch), Chakara, Manegaon **Specimen Voucher No**. - JVG-660.

The leaves are used to treat the stomach problems in goat, cow, bull and buffalos. The fruits are dipped in cold water for some time and then the extract is given to the domestic animal in high dose to remove the poisonous elements from the digestive system.

37. ***Terminalia bellirica*** (Gaertn.) Roxb (**Family:** - Solanaceae **Local name**: - Behada), Movadi, **Specimen Voucher No**. - JVG-550.

2-3 tolas (aprox.20-30 gm) of dried stem bark powder is boiled in a glassful of water for 3-4 minutes and the decoction obtained is given orally with 1-2 tsp of Nilgiri (*Eucalyptus globuulus*) oil to the goats given orally twice a day for 3-4 days for curing blood dysentery.

38. ***Tephrosia perpurea*** Pers (**Family:** - Fabaceae **Local name**: - Diwali), Common Sawargaon, **Specimen Voucher No**. - JVG-605.

A handful of fresh root pieces are boiled in 2-3 glasses of sheep's milk for 5-6 minutes and the remaining decoction is administered once daily up to 3-5 days to improve muscular strength in male goats.

39. ***Vitex negundo*** L. (**Family:** - Verbenaceae **Local name**: - Nirgudi), Nimgaon, Varathi **Specimen Voucher No**.- JVG-1112

Tender leaves are ground with pepper and garlic and given to cure infectious diseases while the warm extract of fresh leaves is given to get relief from muscular pain.

40. ***Wattakaka volubilis*** (L. f.) Stapf. (**Family:** - Asclepediaceae **Local name**: - Malkani), Nimgaon, **Specimen Voucher No**.- JVG-187

Leaf paste is mixed with common salt and applied on affected places to treat all types of swellings and wounds.

41. ***Woodfordia fruticosa*** (L.) Kurz. (**Family:** - Lythraceae **Local name**: - Dhayati, Dhak), Nimgaon, **Specimen Voucher No**.- JVG-402

Two to three teaspoon of fresh flower's extract with same amount of stem bark extract of 'Neem' *(Azadirachta indica*.) is administered twice a day for 2-3 days in treatment of dysentery.

Results and Discussion

The traditional knowledge of tribal communities of Bhandara district has high Ethnobotanical importance. They utilize

numerous plants and their various parts *viz*., roots, leaves, stems and rhizome for various Ethnoveternary practices. During the field survey, Ethnoveternary data of 41- species of plants belonging to 36 genera of 27- families have been collected. Among the documented useful species the families Fabaceae, Caesalpiniaceae, Solanaceae, Cucurbitaceae and Asclepediaceae is found to be most often used family in the study while *Gardenia resinifera* is a plant which is not enumerated still for the Ethnoveterinary use by the any tribe, this is a first report were the tribal peoples of Bhandara district use this plant to treat the ailments of domestic animals. The leaves are the predominant part utilized in the treatment of veterinary diseases and most of the plants are used to treat fever in livestock. Decoction, paste, powder and mixture of plants are the common methods employed for the preparation of medicinal plants. Most of the reported Ethnoveterinary medicinal plants are used to treat fever, wounds and dysentery.

Conclusion

Traditional knowledge of plants in many tribal communities is changing because of rapid socioeconomic and cultural changes. This is particularly true in the tribal people in Bhandara district of Maharashtra. Documentation of this knowledge is valuable for the communities and their future generations and for scientific consideration of wider uses of traditional knowledge in treating domestic animals. The low cost and almost no side effects of these traditional preparations with medicinal plants make them adaptable by the local community. The wealth of this tribal knowledge of medicinal plants points to a great potential for research and the discovery of new drugs to cure the diseases of animals. So, further scientific assessment of these medicines for Phytochemical, biological and pre-clinical and clinical studies is, however, greatly needed.

References

Ganesan S, Chandhirasekaran M and Selvaraju A (2008). Ethno-veterinary health care practices in Southern districts of Tamil Nadu. Indian J. Trad. Knowled., 7: 347-354.

Geetha S, Lakshmi G and Ranjithakani P (2006). Ethnoveterinary medicinal plants of Kollihills, Tamil Nadu. J. Econ. Taxon. Bot., 12: 284-291.

Girach RD, Brahman M and Misra MK (1998). Folk veterinary herbal medicine of Bhadrak district, Orissa, India. Ethnobotany, 10: 85-88.

Harsha VH, Shripathi V and Hegde GR (2005). Ethnoveterinary practices in Uttara Kannada districts of Karnataka. Indian J. Trad. Knowled., 4: 253-258.

Jain, S.K., Srivastava, Sumitra. 1987. Dictionary of Ethnoveterinary. Plants of India. Deep Publications, New Delhi, India.

Jain, S.K., 2003. Ethnoveterinary recipes in India: A botanical analysis. Ethnobotany 15, 23-33.

Kone WM and Atindehou KK (2008). Ethnobotanical inventory of medicinal plants used in traditional veterinary medicine in Northern Cote d'Ivoire (West Africa). South Afr. J. Bot., 74: 76-84.

Kiruba S, Jeeva S and Dhas SSM (2006). Enumeration of Ethnoveterinary plants of Cope Comorin, Tamil Nadu. Indian J. Trad. Knowled., 7: 576-578.

Masika PJ, Van Averbeeke W and Sonandi A (2000). Use of herbal remedies by smallscale farmers to treat livestock diseases in central Eastern Cape Province, South Africa. J South Afr. Vet. Assoc., 71: 87-91.

Mini V and Sivadasan M (2007). Plants used in Ethno veterinary medicine by Kurichya tribes of Wayanad district in Kerala India. Ethnobotany 19: 94-99.

Patil M. V., Patil, D.A., 2001. Ethnoveterinary herbal medicines from Nasik District (Maharashtra). Journal of Non-timber Forest Products 8(1-2), 19-24.

Patil H. M. and S. J. Patil (2013) Ethno-veterinary medicinal preparations of tribals from shirpur tahsil, dhule district,

Maharashtra, India, KU Journal of Science, Engineering and Technology Vol. **9**,(I);134-139.

Rahman CH, Ghosh A and Mandal S (2009). Studies on the Ethno veterinary medicinal plants used by the tribes of Birbhum district, West Bengal. Indian J. Trad. Knowled., 33: 333-338.

Rajan S and Sethuraman M (1997). Traditional veterinary practices in rural areas of Dindigul,Tamil Nadu, India. Indigen. Knowled. Dev. Mon., 5: 709.

Gupta Rakhi, M. G. Vairale, P. R. Chaudhari and S. R. Wate 2009. Ethnomedicinal Plants Used by Gond Tribe of Bhandara District, Maharashtra in the Treatment of Diarrhea and Dysentery Ethnobotanical Leaflets 13: 900-09.

Reddy, K.N. and Raju, R.R.V. (1999) Plants used in ethno-veterinary practices in Anantapur district, Andhra Pradesh J. Econ. Tax. Bot. **23**(2):347-357.

Rothe, S. P. (2005) Ethno-veterinary medicinal plants study from Melghat tribal region of Satpuda range. J. Bioinfolet 2(2):141-43.

Satya V and Solanki CM (2009). Indigenous knowledge of veterinary medicines among tribes of West Nimar, Madhya Pradesh. Indian J. Trad. Knowled., 33: 896-902.

Schillhorn van Veen TW (1996). Sense or Nonsense? Traditional methods of animal disease prevention and control in African savannah. In: McCorkle CM, Mathias E and Schillhorn van Veen TW (eds.). Ethnoveterinary Research and Development, Intermediate Technology Publications, London, pp. 338

Singh, N.P. and S. Karthikeyan (2000) Flora of Maharashtra state (Dicots) Vol I & II BSI., Calcutta.

Tabuti JRS, Dhillion SS and Lye KA (2003). Ethnoveterinary medicines for cattle (Bos indicus) in Bulamogi County, Uganda: plant species and mode of use. J Ethnopharmacol., 88: 279-286.

Yadav D (2009). Ethno veterinary plants from tribes in habited localities of Ratlam district Madhya Pradesh India. Indian J. Trad. Knowled., 33: 64-67.

Yineger H, Kelbessa E, Bekele T and Lulekal E (2007). Ethnoveterinary medicinal plants at Bale Mountains National Park, Ethiopia. J. Ethnopharmacol., 112: 55- 70.

Zschocke S, Rabe T, Taylor JLS, Jäger AK and van Staden J (2000). Plant part substitution- a way to conserve endangered medicinal plants? J. Ethnopharmacol., 71: 281-292.