Indian Journal of Traditional Knowledge
Vol. 14 (2), April 2015, pp. 319-324

Ethnoveterinary practices for small ruminants followed by rural folks in southern Odisha

Amiya K Rautray[1], Rajasri Sahoo[2], KK Sardar[3]*, RC Patra[4] & A Sahoo[5]

[1]Regional Research and Technology Transfer Station, Bhawanipatna, Orissa University of Agriculture and Technology, Odisha; [2]Department of Botany, Utkal University, Vanivihar, Bhubaneswar 751004;

[3]Department of Pharmacology & Toxicology; [4]Department of Veterinary Medicine, Orissa University of Agriculture and Technology, Bhubaneswar 751003; [5]Central Sheep and Wool Research Institute, Avikanagar, Rajasthan

*E-mail: kksardar@gmail.com

Received 30 October 2013, revised 19 February 2015

The present study is aimed at identification of the traditional medical practices being adopted by the rural folks in the treatment of small ruminant diseases in Bhawanipatna block in Kalahandi district of Odisha state. Extensive field survey in 12 villages (Manoharpur, Medinpur, Sujanpur, Jammunabahal, Balarampur, Sagadia, Ichchapur, Sanakhairamala, Kadappa, Chhatiguda, Bangabadi, Kadapada) in and around Bhawanipatna was carried out through 36 regular and repeated informal visits, and 160 informants residing in these villages were consulted through participatory rural appraisal method. Information was gathered through open interaction and door to door interview, and through personal interrogation. A total of 23 species of herbal plants have been identified which were used either alone or in combination as traditional remedies for 24 different conditions/ diseases in livestock including important conditions like hoof infection, liver disorder and enteritis to emergency conditions like tympany/ bloat and hemorrhage. About 2000 small ruminants have been treated by the total informants over the years with the use of herbal remedies. The success rate of the practices used was claimed by the native folk to be 50-60 %. Use of such medicinal plants is of greater value in view of the socioeconomic conditions of the small ruminants owners in reducing the cost of treatment.

Keywords: Medicinal plants, Treatment, Small ruminants

IPC Int. Cl.[8]: A61D, A61K, A61K 36/00, A01D 7/00, A01D 11/00

The use of plants and their parts as the source of medicine for animal healthcare has continued since ancient times for curing diseases. This practice is still continuing in many parts of the country where veterinary services and the facilities hardly reach the beneficiaries in remote rural areas and the allopathic treatment of animals is not cost effective, particularly in small ruminants[1]. The ethnoveterinary practices rely on folk beliefs, traditional knowledge and skills, used for animal healthcare practices, and are transmitted from generation to generation through oral communication without any documentation[2]. Such treasure of knowledge is even less well documented in animal practice and in human practice. These ethnoveterinary practices may bring considerable benefits in vast areas of the developing world where the average farmer can seldom obtain or afford veterinary drugs more particularly by small animals holders in tribal dominated population. Moreover, about 80% of the people in the developing countries rely on traditional medicine based largely on species of plants and animals for their primary healthcare[3].

Kalahandi district covering a geographical area of 7920 sq km lies in between 19.3 to 21.5 N Latitude and 82.20 to 83.47 E Longitude. The district occupies the South Western portion of Odisha, bordered to the North by the Bolangir and Nuapada, to the South by the Nabarangpur, Koraput and Rayagada districts, and to the East by the Rayagada, Kandhamal and Boudh districts. Total rural population of the district is around 14.5 lakh whereas the urban population is 1.2 lakh. The district population is mainly dominated by SC and ST community and accounts to 2.9 and 4.5 lakh, respectively, as per 2011 census. The district has got two sub divisions namely Bhawanipatna and Dharmagarh having 13 blocks, and 2236 villages. The district has largely an agriculture-based economy. The

*Corresponding author

majority of tribal population, particularly those living in the villages, rear goats as source of livelihood and depend largely on herbal medicines for remedy[4].

A review of literature suggested that the indigenous veterinary knowledge used by the tribal folks of Kalahandi district for treatment of small ruminants' ailments has not been documented so far. Therefore, the present study was planned to record the scattered knowledge of ethnoveterinary practices used for maintaining health and curing diseases of small ruminants in rural areas by small ruminants' keepers in migratory and non migratory system of rearing by personal interrogation and interview.

Methodology

Extensive field survey was carried out in and around Bhawanipatna in Kalahandi district of Odisha state for a period of 1 year from January 2010 to January 2011. Regular informal and repeated visits to 12 villages in the Bhawanipatna block were made to explore the traditional uses of the medicinal plants, and information was gathered through open interaction and door to door interview, and through personal interrogation with prior consent of the respondents. The data on use of herbal formulations were collected from experienced rural folks, herdsmen, shepherds, sheep and goat keepers and other farmers (n=160). Diseases of goats and knowledge on ailments, herbal formulation used were documented. Such extensive and intensive study was conducted in 12 villages (Manoharpur, Medinpur, Sujanpur, Jammunabahal, Balarampur, Sagadia, Ichchapur, Sanakhairamala, Kadappa, Chhatiguda, Bangabadi, Kadapada) and 160 informants residing in these villages were consulted through participatory rural appraisal method and with prior consent of the participating informant. The medicinal plants collected in the present study were identified and authenticated by referring to published Indian and regional literatures[5,6] and consulting with the Department of Botany, Utkal University, Bhubaneswar.

Results

The herbal ethnoveterinary practices used by rural folks in southern Odisha for the treatment of small animals' ailments are given in Table 1, that documents the plant species used as traditional remedies, the component of medicinal plant, mode of use and condition/ diseases against which the plants were used. A total of 23 species of herbal plants have been identified which were used either alone or in combination as traditional remedies for 24 different conditions/ diseases in livestock including hoof infection, liver disorder and enteritis and emergencies like tympany/ bloat and hemorrhage. Around two thousand small ruminants were treated by 160 informants with the use of these herbal preparations over ages**.** The informants had treated 18 diseases/ conditions in small ruminants including flatulence, diarrhea, coli, hepatic disorders etc. Three different herbal preparations were being used for treatment of tympany/ flatulence (condition no. 12 in Table 1) whereas two preparations were used to treat blood in urine (hematuria; condition no. 5 in Table 1). Treatment and prevention of skin problems in small ruminants with the use of the neem (*Azadirachta indica* A. Juss) leaves and turmeric (*Curcuma longa* L.) as bath were most commonly reported by 8 respondents. The seeds as well as leaves of coriander (*Coriandrum sativum* L.) and turmeric powder were used for the treatment of food poisoning, constipation, hematuria and other digestive disorders. Applications of turmeric paste for healing of wound, cowpea (*Vigna unguiculata* (L.) *Walp*.) leaves, *Aloe vera* (L.) pulp and onion (*Allium cepa* L.) paste to treat burns, drenching of tamarind (*Tamarindus indica* L.) juice to treat dehydration, massaging with mixture of mustard (*Brassica juncea (*L.) Czern., and camphor for treatment of shock, drenching of soaked tamarind leaves and pulp to prevent pyrexia were used by rural folks of southern Odisha. The present report documents for the first time the use of *Aloe vera* (L.) pulp and onion (*Allium cepa* L.) paste to treat burns, and drenching of tamarind (*Tamarindus indica* L.) juice to treat dehydration.

Mixture of garlic (*Allium sativa* L.) and black pepper (*Piper nigrum* L.) was useful in the treatment of hoof infection due to non-specific microorganisms. Black pepper was also used to relieve tympany (intestinal) and bloat. Several other ethnoveterinary and medicinal practices were used by the local tribes including feeding of date palm (*Phoenix dactylifera* L.) oil mixed with tamarind juice to relieve colic; drenching of palm oil mixed with charcoal to relieve bloat, feeding of leaves of Ashwagandha (*Withania somnifera* L.*)* for curing liver disorder; drenching of concentrated decoction of mango bark for enteritis; and application of tobacco (*Nicotiana tabacum* L.) extract with ground sugar to treat corneal opacity.

Table 1—Ethnoveterinary practices used for the treatment of small ruminants in southern Odisha

S. No.	Diseases of sheep/goat	Local name	English name and botanical name of herb/ plant	Component and dose	Mode of use, dose and application
1.	Skin infection including fungal infection (1)	*Nimba and haldi*	*Neem* (*Azadirachta indica* A. Juss) leaves and *turmeric* (*Curcuma longa* L.)	Leaves and rhizome, respectively	Crude extract of 100gm of leaves and 100gm rhizomes is used as bath extract Paste was prepared using above doses for external application for 5 to 7 days
2.	Growth promoting effect (2) against its use as anti-diabetic in human beings	*Shilajit, Baragachha and Kalara*	Shilajit (*Asphaltum*), Indian banyan tree (*Ficus benghalensis* L.) and bitter gourd (*Momordica charantia* L.)	Milk sap of banyan tree	One liter of decoction prepared from 100gm of shilajit, 50gm of milk sap and 500gm of bitter gourd was used @ 10-15ml orally daily
3.	Food poisoning (3), constipation (4), hematuria (5)	*Dhania and Haldi*	*Coriander* (*Coriandrum sativum* L.) and *turmeric* (*Curcuma longa* L.) powder	Seeds and rhizome, respectively	100gm of each was used to prepare paste and around 20gm was fed orally twice daily
4.	Burns (6)	*Catjang, Ghikuari and piaja*	Cowpea (*Vigna unguiculata* (L.) *Walp*.) leaves, *Aloe vera* (L.) pulp and onion (A*llium cepa* L.)	Seeds	Paste was prepared using 100gm each of leaves, *Aloe vera* (L.) pulp and onion and was applied on affected part.
5.	Shock (7)	*Sorisa*	*Mustard* (*Brassica juncea* (L.) Czern., and camphor from *Cinnamomum camphora* (L.) J. Presi	Seeds	Mixture of mustard oil (500ml) with 50gm of camphor fed @ 50ml orally twice daily
6.	Hemorrhage (8)	*Tulasi and nimba*	*Tulsi* (*Ocimum tenuiflorum* L.) leaves and *neem* leaves (*Azadirachta indica A. Juss*)	Leaves	100 ml of decoction prepared from 50 gm of each of the two leaves and given @50ml twice daily
7.	Respiratory disorders including cough, bronchitis and other miscellaneous disorders (9)	*Tulasi and mahu*	*Tulsi* (*Ocimum tenuiflorum* L.) along with honey	Leaves	Approximately, 50 gm of leave was added to 20ml of honey to prepare a mixture/paste and was fed to animal
8.	Bone fracture and broken horn (10)	*Mandia and Masura dali*	*Finger millet* (*Eleusine coracana* (L.) Gaertn.) and *Lentil* (*Lens culinaris* Medik.)	Seeds	100gm each of the seed was used to prepare a paste, which is applied externally to the affected part.
9.	Colic (11)	*khajuri* and *Tentuli*	*Date Palm* (*Phoenix dactylifera* L.) oil with tamarind (*Tamarindus indica* L.) juice	Oil	100g of tamarind power was added to around 100ml of oil and the mixture is drenched to the animal
10	Bloat (12)	*Khajuri*	Date Palm (*Phoenix dactylifera* L.) oil with charcoal	Oil	50gm of charcoal was added to around 100ml of oil and the mixture is drenched to the animal
	Bloat/tympany (12)	*Golamaricha*	Black pepper (*Piper nigrum* L.)	Seed	50 gm of powder prepared using seeds were fed to animal to relive bloat/ tympani
11	FMD (local application) (13)	*Harida and Bahada*	*Harida* (*Terminalia chebula* Retz.) and *bahada* (*Terminalia bellirica* (Gaertn.) Roxb.	Seed	100gm of each was used to prepare paste with water and applied locally as lotion
	Hoof infection of nonspecific origin	*Rasun and golmaricha*	garlic (*Allium sativa* L.) and black pepper (*Piper nigrum* L.)	Rhizome and seeds	50gm of each was used to prepare paste for external application
12	Dehydration (14), pyrexia (15)	*Tentuli*	*Tamarind* (*Tamarindus indica* L.)	Fruit	Juice of Tamarind was prepared in one liter water and fed @ around 50ml orally
13	Tympany (12), diarrhea (16), haematuria (5), indigestion (17)	*Kadali*	Banana (*Musa parasidiaca* L.)	Fruit and leaf	Juice of the leave and fruit is prepared in water and fed to animal @ 50ml daily
14	Liver disorder/hepatic insufficiency (18)	Aswagandha	*Ashwagandha* (*Withania somnifera* L.*)*	Leaves	500gm of leave was used to prepare around 1L decoction and fed orally @ 50ml daily

The parenthesis in the disease column indicate the serial number of the conditions treated by the traditional healers

The crushed seed cake of ground nut (*Arachis hypogea* L.*)* fed once daily in ration was reported to prevent ketosis in cattle. Certain crude practices reported by the rural folks include cauterization on skull to prevent the brain diseases, fogging of neem leaves with turmeric powder for prevention of small pox, cauterization at external canthus of healthy eye to cure the loss of vision of other eye.

Discussion

The tribal communities of Kalahandi district of Odisha depend on the herbal drug almost fully for their primary healthcare, partially due to their socioeconomic and cultural conditions[4]. The herbal ingredients used for treatment of livestock diseases include plant extracts, seeds, oils, leaves, tubers and roots of various medicinal plants. There was variation between the respondents regarding exact amount of the component used for traditional healing of a condition/ diseases. The approximate doses used by the healers/ respondents were given in Table 1. Similarly, use of 42 plant species as folk veterinary medicine has been documented in the Bareilly district of Uttar Pradesh[7]. However, the herbal plants used in Kalahandi district as documented in this paper for treatment of similar conditions/ diseases such as Foot and mouth disease, fever, flatulence, diarhoea and constipation were different from those reported from the Bareilly district. Herbal preparations have the ability to affect the different body systems and increase stamina, help the nervous system to function correctly and provide good supply of vitamin B complex. These effects are due to the chemical constituents present in the plant ingredients used in herbal preparations[1,7]. In particular, the prospects of ethnoveterinary practices and the beneficial role of shilajit (*Asphaltum*), milk sap of *Ficus benghalensis* L.*,* and bitter gourd used in diabetes in human beings have been documented[7]. In the present investigation, such preparations are being used in small ruminants for growth promotion.

The crude extracts prepared from mixture of neem (*Azadirachta indica* A. Juss.) leaves and turmeric (*Curcuma longa* L.) were most commonly used as bath for the small ruminants at least for 3-4 days in the treatment of various forms of skin infections. Alternatively, turmeric and neem leaf mixture is also used for prevention and treatment of different fungal infections. The efficacy of above ingredients has been reported earlier with high success rates[10]. The leaves of neem (100 gm) and turmeric (100 gm) were ground to make a paste with a little amount of lukewarm water and were applied topically for 5-7 days, and the practice was found to be very effective against any kind of skin infections in small ruminants. The beneficial effect of neem against skin infection might be due to antiseptic, antioxidant and fly repellent properties. The efficacy with the use of seeds and leaves of coriander (*Coriandrum sativum* L.) and turmeric powder for the treatment of food poisoning, constipation, hematuria and other digestive disorders employed by the rural livestock owners, has been well supported and documented[11]**.**

Tulsi (*Ocimum tenuiflorum* L.) and neem (*Azadirachta indica* A. Juss) leaves were being used to arrest hemorrhage after making a decoction. Tulsi along with honey was used for treatment of cough, bronchitis and miscellaneous respiratory disorders. The rhizome of turmeric was reported to be used in the treatment of sprain, constipation, mastitis, foot and mouth diseases, broken horn and ectoparasitic infestation. Mixture of turmeric (*Curcuma longa* L.) and sandal wood (*Santalum album* L.) paste was applied to the affected part for reducing inflammation. Immature grains of paddy (*Oryza sativa* L.) mixed with turmeric powder were used to relieve muscle sprain and ligament shift. The paste of seeds of finger millet (*Eleusine coracana* (L.) Gaertn., and lentil (*Lens culinaris* Medik**.**) were used by the goat keepers in case of bone fracture and broken horn for fracture repair. The affected area was bandaged with bamboo chips and tamarind juice mixed with red clay was applied on the bandaged area which was found to bring healing of bones within 28 days. Similar finding of bone healing after application of ethnoveterinary practices in Uttarakhand have also been reported[11]. Turmeric and neem leaves possess anti-inflammatory and antiseptic properties that might have helped in curing the disease[12]. The success rates, as per the report of the farmers, ranges from 50-60% in small ruminants.

The crushed seed cake of ground nut (*Arachis hypogea* L.*)* fed once daily in ration has been reported to prevent ketosis in cattle. Certain crude practices reported by the rural folks include cauterization on skull to prevent the brain diseases, fogging of neem leaves with turmeric powder for prevention of small pox, cauterization at external canthus at healthy eye to cure the loss of vision of other eye.

The evolution and development of ethnoveterinary medicines preceded the human civilization[13,14].

Traditional medicine has existed since pre-historic times and has flourished today as a primary form of animal medicine in considerable portion of the world's rural animal population. Small ruminants' owners and local healers in these remote villages were capable of identifying the systemic problems and rarely approached veterinary services and used allopathic medicine for the common problems and attended the diseases in small ruminants with the ethnoveterinary practices. However, the rapid socio-economic and technological changes have resulted in almost or total loss of traditional knowledge[15-17]. The rate of disappearance of this knowledge is very rapid, and may become worse in future. On the contrary, a very few livestock keepers particularly in rural can access and afford modern healthcare practices[16].

The present study on collection and scientific documentation has traditional significance in disseminating the knowledge of the local tribes on folk veterinary medicine used for the management of the small ruminants. These are age-old practices and little documented. The validation of such knowledge and dissemination of the know-how will benefit the society particularly to the weaker section and rural poor farmers to treat small ruminants in an eco-friendly manner with locally available ingredients, and minimize the danger of extinction of these practices. This could be a cost-effective and easily available practice as against high cost treatment, unaffordable by the rural poor and marginal famers for treatment of small ruminants. Small ruminants are generally kept by marginal and landless farmers with the poor purchasing capacity on healthcare of animals. Besides, the best results from herbal plants in treatment of livestock ailments can only be achieved when the tribal and rural people are taught to judiciously harvest, process, store, preserve and utilize the preparation[19]. A combination of modern and local folk remedies and management practices might be the best approach for chronic problems such as skin infections, hepatic insufficiency, and for optimal growth. Further, numerous drugs have been isolated from the plants employed by primitive society and those have revolutionized modern medical practice.

Conclusion

In the present investigation, rural folks and small ruminants holders were contacted to disclose the herbal ethnoveterinary practices adopted by them for treatment of the small ruminants. The rural folks of southern Odisha used turmeric paste for healing of wound, cowpea (*Vigna unguiculata* (L.) *Walp*.) leaves, *Aloe vera* (L.) pulp and onion (*Allium cepa* L.) paste to treat burns, tamarind (*Tamarindus indica* L.) juice drenching to treat dehydration, massaging with mixture of mustard (*Brassica juncea* (L.) Czern., and camphor for treatment of shock, drenching of soaked tamarind leaves and pulp to prevent pyrexia. The success rate ranged from 50-60 % in small ruminants ethnoveterinary practice. The treasure of information is required to be scientifically validated to study the pharmacological and therapeutic efficacy and to reduce the cost of treatment of small ruminants.

Acknowledgement

The authors are thankful to all the respondents belonging to 12 villages in and around Bhawanipatna block in southern Odisha including Bhuban Nayak, Manoj Sabar, Deba Swain, Sambhu Rana, Krupasindhu Rana, Ladu Rana for providing the information on ethnoveterinary practices adopted by them.

References

1 Mishra D, Cattle wound and ethnoveterinary medicine: A study in Polasara block, Ganjam District, Orissa, India, *Indian J Tradit Knowle*, 12 (2013) 62-65.

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

3 Nfi AN, Mbabya JN, C Ndi C, Kameni A, Vabi M, Pingpoh D, Yonkeu S & Moussa C, Ethnoveterinary medicine in northern provinces of Camerron, *Vet Res Commun*, 25 (2001) 71 -76

4 Nayak S, Behera SK & Misra MK, Ethno-medico-botanical survey of Kalahandi district of Orissa, *Indian J Tradit Knowle*, 3 (2004) 72-79.

5 Chopra RN, Nayar SL & Chopra IC, *Glossary of Indian medicinal plants*, (PID, Council of Scientific and Industrial Research, New Delhi), 1956, 197.

6 Saxena HO & Brahmam M, *Flora of Orissa*, Vol. I-IV, (Regional Research Laboratory, Bhubaneswar), 1994-96, 918.

7 Kumar R & Kumar KA, Folk veterinary medicines in the Bareilly district of Uttar Pradesh, India, *Indian J Tradit Knowle*,12 (2013) 40-46.

8 Alawa JP, Jokthan GE & Akut K, Ethno veterinary medical practices for small ruminants in the subhumid zone of Northern Nigeria, *Preventive Vet Med,* 54 (2002) 79-90.

9 Gupta SS, Prospects and perspectives of natural plants products in medicine, *Indian J Pharmacol,* 26 (1994) 1-12.

10 Mishra D, Ethnoveterinary practices and use of herbal medicines for treatment of skin diseases in cattle: A study in

Polsara Block, Ganjam district, Odisha, India, *Indian J Tradit Knowle,* 4(6) (2011) 250-253.

11 Tiwari L & Pande PC, Ethnoveterinary medicines in Indian perspective: Reference to Uttarakhand, Himalaya, *Indian J Tradit Knowle*, 9(3) (2010) 611-617.

12 Kumar A, Sharma VK, Singh HP, Prem Prakash & Singh SP, Efficacy of some indigenous drugs in tissue repair in buffaloes, *Indian Vet J*, 70 (1993) 42-45.

13 Schillhorn van Veen TW, Sense or nonsense? Traditional methods of animal parasitic disease control, *Vet Parasitol,* 71 (1997) 177-194.

14 Kofi–Tsekpo WM & Kioy WD, Newer direction of plant drug research: The need to examine and investigate traditional remedies for pharmacotheraphy of animal and zoonotic diseases, *African J Health Sci,* 5 (1998) 12–14.

15 Principe PP, The economic significance of plants and their constituents as drugs, In: *Economic and medicinal plant research*, edited by Wagner H, Hikino H & Farnsworth R N, (Academic Press Limited), 1989, 1-17.

16 Longuefosse JL & Nossin E, Medical ethnobotany survey in Martinique, *J Ethnopharmacol,* 53 (1996) 117-120.

17 Kokwaro OJ, *Medicinal Plants of East Africa*, 2nd edn, *East African Literature Bureau*, (General Printers Limited, Nairobi, Kenya), 1993.

18 Maiti S, Chakravarty P, Garai S, Bandyopadhyaya S & Chouhan VS, Ethnoveterinary practices for ephemeral fever of Yak: A participatory assessement by the Monpa tribe of Arunachal Pradesh, *Indian J Tradit Knowle*, 12 (2013) 36-39.

19 Galav P, Jain A & Katewa SS, Traditional veterinary medicines used by livestock owners of Rajasthan, India, *Indian J Tradit Knowle*, 12 (2013) 47-55.