

Full Length Research Paper

Survey of ethnoveterinary medicine amongst ethnopractitioners of western Uttar-Pradesh province of India

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Comparative ethnobotanical survey was carried out in 10 local communities distributed in nine districts of western Uttar-Pradesh province of India. Interviews conducted during winter and summer of 2009-10 proved to be helpful in recording the indigenous knowledge of the study area. A total of 28 edible plant species collected were mostly consumed in this area. The low cost and almost no side effects of the ethnobotanical preparations made them adaptable for use by the local communities particularly curing various ailments affecting their livestock. Therefore documenting and preserving this indigenous knowledge is urgently needed for developing strategic management plans for conservation and utilization in a sustainable manner.

Key words: Edible plant species, ethnobotany, local communities, indigenous knowledge.

INTRODUCTION

Ethnoveterinary medicine (EVM) covers people's knowledge, skills, methods, practices and belief about the care of their animal (McCorkle, 1986). There is abundant undocumented traditional knowledge of herbal remedies used to treat animal diseases in most cultures (Raul et al., 1990). Studies carried out in Africa, Asia, Europe, Latin America and North America showed that plants are routinely used as remedy for animal diseases (Ali, 1999; Balemie and Kebebew, 2006).

In the 1980s, the term "veterinary anthropology" was coined for a particular approach to animal health care, which was researched through "using the basic repertoire of anthropology's research skills and techniques, including observation, interview and participation" (Kohler-Rollefson and Braunig, 1998). Ethnoveterinary medicine or ethnoveterinary research was defined by McCorkle and Martin, 1998 as: The holistic, interdisciplinary study

of local knowledge and its associated skills, practices, beliefs, practitioners, and social structures pertaining to the healthcare and healthful husbandry of food, work, and other income-producing animals, always with an eye to practical development applications within livestock production and livelihood systems, and with the ultimate goal of increasing human well-being via increased benefits from stock raising.

India is one of the world's 12-megadiversity countries accounting for 8% of global plant genetic resources and higher share of micro-organisms (Bidwal, 1997). During the last few decades, there has been an increasing interest in the study of medicinal plants and their traditional use in different parts of India, and there are many reports on the use of plants in traditional healing by either tribal people or indigenous communities of India (Hebbar et al., 2004; Saikia et al., 2006; Nigam and Sharma, 2010).

Traditional knowledge and culture, including the practices aimed at curing animals, have been lost through the decades (Hauser et al., 1994). The ethnoveterinary practices in major parts of India remains

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Figure 1. Location map of the Study area in western Uttar-pradesh marked with blue color.

to be documented. The main objective of the study was the recovery of the knowledge related to ethnoveterinary medicine. According to Tabuti et al. (2003), systematic studies on EVM can be justified for three main reasons:

1. They can generate useful information needed to develop livestock healing practices and methods that are suited to the local environment.
2. EVM could be a key veterinary resource and could add useful new drugs to the pharmacopoeia.
3. EVM can contribute to biodiversity conservation.

MATERIALS AND METHODS

The study area

Western Uttar-Pradesh is situated in the foot-hills of the Himalayan range with an area of 79,803 km² and lies between 29° 58' to 26° 28' North latitudes and 77° 3' and 84° 39' East longitudes. The

climate of the study area is extremely tropical. Summers are too hot, with winters usually cold and foggy. Western Uttar-Pradesh experiences southwestern monsoon rains from July to September. It stands on the west bank of the river Yamuna. During the year 2009 to 10, frequent surveys were conducted to know edible plant species used in ethnoveterinary practices in selected areas of western Uttar-Pradesh, India. These areas include: Saharanpur, Muzaffarnagar, Bulandshahar, Aligarh, Muradabad, Badaun, Mathura, Rampur, and Gautam Buddha nagar (Figure 1). Ten small communities distributed in nine districts as described above were selected for this study. Each of the districts was represented by one or more villages (communities) located mainly within homogenous rural areas as Dalits, Gaderias, Jats, Rajputs, Garhas, Jojhas, Bhagiratis, Yadavs, Ahirs, Ranghars and were largely dependent on agriculture.

Ethnoveterinary data collection and analysis

Interviews were conducted during winter and summer of 2009 to 2010, with approximately 20 to 30 informants in each district. Total numbers of interviewees had been 120 and were mainly selected

using snowball technique (Ghirardini et al., 2007). Informants with a sound traditional knowledge of useful wild plants, mostly either native born or had been living in the region for more than 30 years, were interviewed. Information was collected from the persons with the age between 30 and 75, with an average age of 40 years. A clear expression of consent was also obtained before each interview. Through out this field study the ethical guidelines adopted was by the international society of ethnobiology (ISE). Questions addressed to the informants about ethnoveterinary practices were mainly focused on common local name, knowledge about the past and present use, mode of consumption, parts of the plants in use, the manner of their preparation and administration, and procurement method. A prerequisite questionnaire was prepared and given to personnel having reasonable knowledge of ethnoveterinary medicine. The response sheet was given to 30 judges who were clinicians and pharmacologists from veterinary colleges and institutions. The responses were scored as 3 (valid), 2 (cannot say), 1 (not valid).

RESULTS

The traditional knowledge of tribal communities of western Uttar-Pradesh India, had high ethnobotanical importance. People utilized numerous plants and their various parts. Table 1 describes the plants used by its Latin name, followed by family to which it belongs, local name, methods of preparation and dosage, frequency of adoption by farmers, and validity scores as per prepared questionnaire. The present investigation revealed 28 plant species belonging to 19 families commonly used as veterinary medicines by different ethnic communities of western Uttar-Pradesh India.

The use of traditional ethnoveterinary practices in most developing countries as a normative basis for the maintenance of good health has been widely observed (UNESCO, 1996). Indigenous practices were identified. For each practice, the percentage of farmers practicing and validity scores were calculated. It was found that, after studying the existing ethnoveterinary practices, we can improve them by scientific basis for testing, modification and adoption. The plant species used are commonly available in the region and play special role in veterinary medicine.

Various animal conditions were identified in the surveyed area. The major and most common animal diseases among livestock were skin conditions, diarrhea, loose motion, and parasites. The ethnoveterinary medicinal use of 28 plant species was documented. Most medicinal species were collected from the wild. The most frequently used plant parts were whole plants, followed by leaves and roots. Based on the scientists validity score and the frequency of adoption by farmers, some preparations proved to be most significant than others, like seed powder of *Coriandrum sativum* mixed with leaf of *Lawsonia inermis* and water kept in a pitcher overnight were given to animal, twice a day, to cure loose motion; mixture of *Curcuma longa* rhizome powder, rock salt and ghee was fed to cure the swelling of teats; fruits of *Ficus glomerulata* was given to the animal twice a day to

facilitate easier removal of placenta after delivery; leaf paste of *Annona squamosa* mixed with lime was applied on the wound, bandaged, to cure foot disease; decoction of fine methi seed powder in water was given two times daily to treat twitching; decoction of *Withania somnifera* root powder, Gur and *Zingiber officinale* powder mixed together and boiled with milk was given to animal twice a day to cure retarded placenta (Table 1).

People of the western Uttar-Pradesh considered traditional remedies as their first choice of animal disease treatment.

For some preparations, the scientists could not comment on the validity practice, for example in case of *Buchanania latifolia*, *Musa paradisiaca*, *Carisa carandas*, the scientists could not comment on whether the practice was valid or invalid. In studies by Bahamani et al. (2011) and Mutheeswaran et al. (2011), similar results were recognized for treatment of different livestock disorders in accordance with our results. Despite the undoubted success of a scientific approach to pharmaceuticals, the last few decades have witnessed a spectacular rise in interest in herbal medicinal products.

DISCUSSION

This study showed the need for the enlightenment of traditional healers and the public in general, on selective use of plants for the treatment of livestock diseases. Few ethnoveterinary remedies have been tested in livestock species clinically. To get the true picture of a remedy's efficacy, more field surveys are needed and checking the efficiency of these practices at research stations will ensure desired results. There is need for official safeguards to be installed in the process to avoid abuse and misuse of ethnoveterinary knowledge. Today, ethnoveterinary medicine remains an ethnoscientific resource that is yet to be tapped and has a far-reaching implication on the economic development and enhancement of veterinary health of particularly rural poor communities.

There is need also to facilitate a multilateral dialogue between local communities, Non-Governmental Organizations (NGOs), governments, civil society and the private sector, with the ultimate objective of mainstreaming indigenous/traditional knowledge into the activities of development partners and to optimize the benefits of development assistance, especially to the poor.

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Table 1. Ethnoveterinary practices followed by farmers and scientists rationale on farmer's practices.

Parameter	Ethnoveterinary practices	Frequency of adoption	Validity score		
			3	2	1
Latin name	<i>Acacia nilotica</i> (L.) Wild. ex Delile				
Family	Mimosaceae				
Local name	Babool	98 (81)	12 (30)	23 (58)	5 (13)
Methods of preparation and dosage	Flower powder of <i>Acacia nilotica</i> mixed with water was administered orally to animal twice a day to cure jaundice.				
Latin name	<i>Capsicum annum</i> L.				
Family	Solanaceae				
Local name	Mirch	89 (74)	22 (55)	16 (40)	2 (5)
Methods of preparation and dosage	Paste of <i>Capsicum annum</i> fruits, <i>Allium sativum</i> seeds, <i>Cuminum cyminum</i> seeds and alum mixed water were administered to animal twice a day to cure the dullness in animal.				
Latin name	<i>Coriandrum sativum</i> L.				
Family	Apiaceae				
Local name	Dharla	119 (99)	11 (28)	27 (68)	18 (45)
Methods of preparation and dosage	Seed powder of <i>Coriandrum sativum</i> mixed with leaf of <i>Lawsonia inermis</i> and water kept in a pitcher overnight were given to animal twice a day to cure loose motion				
Latin name	<i>Curcuma longa</i> L.				
Family	Zingiberaceae				
Local name	Haldi	108 (90)	31 (78)	8 (20)	8 (20)
Methods of preparation and dosage	Mixture of <i>Curcuma longa</i> rhizome powder, rock salt and ghee was fed to cure the swelling of teats (nipple).				
Latin name	<i>Dalbergia sisoo</i> Roxb.ex DC				
Family	Fabaceae				
Local name	Shisham	73 (61)	3 (8)	15 (38)	22 (55)
Methods of preparation and dosage	Leaf paste of <i>Dalbergia sisoo</i> mixed with water was given to animal twice a day to cure blisters and leg sore.				
Latin name	<i>Aloe barbendis</i> P. Mill				
Family	Liliaceae				
Local name	Ghilkumari	119 (89)	17 (43)	14 (35)	9 (23)
Methods of preparation and dosage	<i>Aloe barbendense</i> pulp mixed in water was given to animal twice a day to cure burns of the animal.				

Table 1. Contd.

Latin name	<i>Azadirachta indica</i> A. Juss				
Family	Meliaceae				
Local name	Neem	77 (64)	6 (15)	27 (68)	7 (18)
Methods of preparation and dosage	Fresh leaves of <i>Azadirachta indica</i> and salt were ground together and boiled in water decoction is put into eyes of the animal twice a day to remove insects from the eye.				
Latin name	<i>Ficus glomerulata</i> Roxb.				
Family	Moraceae				
Local name	Gular	116 (97)	17 (43)	21 (53)	2 (5)
Methods of preparation and dosage	Fruits of <i>Ficus glomerulata</i> was given to the animal twice a day to facilitate easier removal of placenta after delivery.				
Latin name	<i>Buchanania latifolia</i> Roxb.				
Family	Anacardiaceae				
Local name	Chironji	73 (61)	18 (45)	17 (43)	1 (3)
Methods of preparation and dosage	Root bark powder of <i>Buchanania latifolia</i> with cow milk was filtered and given to animal twice a day during back bone fracture				
Latin name	<i>Annona squamosa</i> L.				
Family	Annonaceae				
Local name	Sharifa	108 (90)	1 (78)	8 (20)	7 (18)
Methods of preparation and dosage	Leaf paste of <i>Annona squamosa</i> mixed with lime was applied on the wound bandaged to cure foot disease.				
Latin name	<i>Butea monosperma</i> (Lam.) Taubert				
Family	Fabaceae				
Local name	Dhak	107 (88)	7 (18)	27 (68)	6 (15)
Methods of preparation and dosage	Amixture of seed powder of <i>Butea monosperma</i> , salt and water were administered to animal twice a day for deworming.				
Latin name	<i>Gymnema sylvestre</i> (Retz) Scheltus				
Family	Asclepiadaceae				
Local name	Gudmar	86 (72)	7 (18)	26 (65)	7 (18)
Methods of preparation and dosage	<i>Gymnema sylvestre</i> fresh leaf paste was applied on the eyelid twice daily to cure cataract.				

Table 1. Contd.

Latin name	<i>Helianthus annus</i> L.				
Family	Asteraceae				
Local name	Suraj mukhi	89 (74)	6 (15)	23 (58)	11 (28)
Methods of preparation and dosage	Fine powder of <i>Helianthus annus</i> was mixed and boiled with coconut oil. Cotton dipped in prepared material was tied on testis to relief swelling of testis				
Latin name	<i>Trigonella foenum-graecum</i> L.				
Family	Fabaceae				
Local name	Methi	120 (100)	20 (50)	17 (43)	6 (15)
Methods of preparation and dosage	Decoction of fine methi seed powder in water was given two times daily to treat twitching				
Latin name	<i>Withania somnifera</i> (L.)				
Family	Solanaceae				
Local name	Ashwagandha				
Methods of preparation and dosage	Decoction of <i>Withania somnifera</i> root powder, Gur and <i>Zingiber officinale</i> powder mixed together and boiled with milk was given to animal twice a day to cure retarded placenta, it also provides swiftness in animals	116 (97)	17 (43)	21 (53)	7 (18)
Latin name	<i>Lawsonia inermis</i> L. Naud				
Family	Lythraceae				
Local name	Mehendi	107 (89)	28 (70)	10 (25)	2 (5)
Methods of preparation and dosage	Dried <i>Lawsonia inermis</i> leaf powder mixed with water was given to animal twice a day to cure hematuria				
Latin name	<i>Syzygium jambos</i> (L.) Alston				
Family	Myrtaceae				
Local name	Jamun	90 (75)	13 (33)	18 (45)	9 (23)
Methods of preparation and dosage	Filtrate of <i>Syzygium jambos</i> bark powder in water mixed with whey was given to animal twice a day to cure hematuria				
Latin name	<i>Capsicum frutescens</i> L.				
Family	Solanaceae				
Local name	Lakmirch	108 (90)	31 (78)	8 (20)	4 (10)
Methods of preparation and dosage	Mixture of <i>Capsicum frutescens</i> fruit powder and rock salt and gur (jaggery) was given to animal twice a day to cure lunacy.				

Table 1. Contd.

Latin name	<i>Helicteres isora</i> L.				
Family	Sterculaceae				
Local name	Marorphali	90 (75)	13 (35)	18 (45)	9 (23)
Methods of preparation and dosage	A mixture of <i>Helicteres isora</i> fruit powder, <i>Cuminum cyminum</i> seed powder and whey was given to animal twice a day to cure dysentery.				
Latin name	<i>Musa paradisiaca</i> L.				
Family	Musaceae				
Local name	Kela	72 (60)	32 (80)	7 (13)	1 (3)
Methods of preparation and dosage	Paste of <i>Musa paradisiaca</i> and sugar candy in water was given to animal twice a day to cure blisters and hoof sores.				
Latin name	<i>Carissa carandas</i> L.				
Family	Apocyanaceae				
Local name	Karonda	83 (69)	4 (10)	31 (78)	5 (13)
Methods of preparation and dosage	<i>Carissa carandas</i> root paste mixed with <i>Coccus nucifera</i> oil was applied twice a day on maggot wound.				
Latin name	<i>Datura metel</i> L.				
Family	Solanaceae				
Local name	Dhatura	72 (60)	7 (18)	7 (68)	22 (55)
Methods of preparation and dosage	<i>Datura metel</i> root powder was given to the animal twice a day to check bleeding of any part of body due to maggot infection.				
Latin name	<i>Saccharum officinarum</i> L.				
Family	Poaceae				
Local name	Sugarcane	90 (75)	13 (33)	18 (45)	9 (23)
Methods of preparation and dosage	<i>Saccharum officinarum</i> leaf was given to the female animal twice a day to cure retarded placenta or to facilitate easier removal of placenta after delivery.				
Latin name	<i>Aloe vera</i> (L.) Burm.f				
Family	Xanthorrhoeaceae				
Local name	Gheekumari	80 (67)	7 (18)	15 (38)	22 (55)
Methods of preparation and dosage	Three or four table spoons of <i>Aloe vera</i> paste mixed with 1 table spoon of salt, were fed for deworming of animal.				

Table 1. Contd.

Latin name	<i>Pongamia pinnata</i> (L.) Pierre				
Family	Fabaceae				
Local name	Karanja	73 (61)	32 (80)	7 (13)	9 (23)
Methods of preparation and dosage	A mixture of phosphorus powder and seed oil of <i>Pongamia pinnata</i> was given to animal twice a day to cure ring worm.				
Latin name	<i>Sorghum vulgare</i> Pers.				
Family	Poaceae				
Local name	Jawar	72 (60)	18 (45)	14 (35)	22 (55)
Methods of preparation and dosage	Seed flour of <i>Sorghum vulgare</i> mixed with whey was given to animal twice a day to cure loose motion.				
Latin name	<i>Vigna radiata</i> (L.) R. Wilczek				
Family	Fabaceae				
Local name	Moong	108 (90)	20 (50)	18 (45)	9 (23)
Methods of preparation and dosage	<i>Vigna radiata</i> seed powder mixed with <i>Arachis hypogea</i> oil was given to animal twice a day to cure cough.				

Total number of farmers = 120. Responses from scientists were scored 3 (valid), 2 (cannot say), and 1 (not valid). Numbers in parentheses are percentages.

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