

PLANT BIO RESOURCES USED IN ETHNO- VETERINARY PRACTICES IN JUMLA DISTRICT

R. R. Gyawali^{1*} and H. R. Paudel²

¹District livestock Service Office, Jumla

²District Plant resources Office, Jumla

(*email: reshamg91@gmail.com)

ABSTRACT

Jumla is one of the districts in high mountain region of Nepal from where the medicinal and aromatic plants, their parts and products are exported annually. A study was carried out from March to June 2014 to document the plant resources used in ethno veterinary practice by local people. Focal group discussions and key informant interviews were carried out to enlist plant bio resources used as ethno veterinary medicines. It was revealed that people used 42 plant resources to correct 28 different ailments in animals. Among the listed plant resources, about 87% were the home products of the district. Hence, the study led to the conclusion that there is opportunity to explore the locally found medicinal plants as ethno veterinary medical practice and commercial veterinary herbal medicine.

Keywords: Ethnoveterinary, Plant resources, ailments

INTRODUCTION

The use of plants as medicine is widespread throughout the world. Indigenous knowledge systems are not only for the cultures from which they evolve, but also for scientists, researchers and planners striving to improve conditions in rural societies. This existing valuable information is needed to be documented before it gets lost or disappeared. In many cases this knowledge is transmitted orally from generation to generation and confined to certain people (Subedi 2000). In Nepal, ethno botanical studies of various ethnic communities started from 1950's decade. Banergi began the systematic documentation of medicinal plants in Nepal. Since then, many works have been done on the documentation of medicinal resources throughout the country. Manandhar (2002) mentioned the ethno-medical uses of 1002 species of plants as used by various ethnic communities (Gurung, Newar, Majhi, Raute, Tamang, Tharu *etc.*) of Nepal. These plants are identified and used as traditional medicine (Bhattraai and Karki 2006; Shrestha *et al.*, 2000; Hasan *et al.*, 2013). Besides, out of total flora reported in Nepal, up to 1796 species of medicinal plants occur in Nepal (Anonymous, 2007).

Jumla is a historic place of situated in the center of Karnali region, where the Nepali language 'Khas' was originated. A tremendous knowledge of those historic people and huge natural stock of medicinal plants found in Karnali region is being utilized for both human and veterinary medical purposes. Not only for ethno veterinary practices, medicinal plants are also used to prepare herbal veterinary medicine and feed supplement and most of its quantity is imported from India, whereas their raw materials are exported from Karnali region of Nepal. About 85 % of Nepal's Medicinal and Aromatic Plants (MAP) are collected from the mid-western and far-western regions (GIZ,2011). Only 5% of the land in mountain region is suitable for cultivation and for that reason

livestock farming and collection of MAP are the main sources of house hold income. Transhumance animal rearing system is well established in the region and livestock such as sheep, goat, horse and other animals are the major source of cash. In this system, almost for half of the year farmers keep their animals far from their human settlements in rangeland areas. These areas lack veterinary service but are rich in medicinal herbs. People use these medicinal plants as veterinary medicines for the treatment of their livestock in the rangelands as well as in permanent settlements. Rokaya *etal.*, (2006) recorded a total of 274 species and 5 varieties of medicinal plant belonging to 63 families and 172 genera from upper Dolpo region of Karnali. Similarly, Sapkota (2001) has reported 58 medicinal plants from Humla used in the treatment of animals and human diseases traditionally. Earlier 39 plant species were listed by Joshi (1991), particularly used as the traditional veterinary medical purpose in Himalayas of Nepal. But specific to Jumla, there is no documented information on the local traditional practices on veterinary medicines using the plant resources. Regarding the medicinal plants found in Jumla, Paudel (2013) started the systematic documentation of medicinal plants and has reported 12 species of important wild medicinal plants with some notes on cultivation technology, uses and sustainable management. So, documentation of plant materials used as ethno veterinary medicine, in this study will assist to plan for their conservation and to promote both the livestock and veterinary herbal enterprises in future particular to the Karnali region and in general all over the country.

MATERIALS AND METHODS

To document the plant species used in ethno- veterinary medicine, focal group discussion was organized at Sinja and Chaudhabis areas of Jumla between March to June 2014. During the field visit, traditional healers were interviewed and gathered information one by one. In focal group discussions, a check list was designed considering the local name of plants, parts of plants used against the ailments or signs and symptoms of domestic animal diseases to enlist them cautiously and correctly. To validate the information obtained from the field, a half day workshop was organized in district head quarter where traditional healers, livestock/veterinary technicians, forest technicians, veterinary medical shopkeepers and livestock farmers were included. All the issues after consensus were taken as outputs of the workshop. The plants species and photographs were collected and taken respectively for the cross checking of the knowledge with different healers. Finally, plants were recorded with their ethno botanical notes, used as in particular disease, along with botanical names, with the citation of their plant families and local name. Quantitative data obtained were analyzed using simple statistical tools of frequency and percentage where as a descriptive analysis was carried out based on consensus made during discussions.

RESULTS

Medicinal plant bio diversity and their use in ethno veterinary medicine

Altogether 42 species of medicinal plants were recorded either heard or used by focal group participants and traditional healers (Table 1). The table indicates that all the plants and plant products were available in Jumla but some of them were not locally produced like *Bennincasa hispida* Linn., *Citrus medica* Linn., *Cucumis melo* Linn., *Curcuma longa* Linn., *Litsea cubeba* (Lour.) Pers. and *Piper nigrum*. and brought from outside. About 87% of the plants stated by the participants were produced in Jumla either cultivated or natural.

Traditional Knowledge on conservation of plants and their utilization

Among the medicinal plants and plant products listed, about 65% were harvested in a sustainable way, because the leaf, fruits, bulbs, bark, seed and by product of these plants were used to prepare the medicine. But harvesting roots for the preparation of medicine recipes was also found in remaining species. The methods of utilization found more or less similar in both the sites where the focal group discussions were held. The study shows that livestock farmers and local healers used the mentioned plant resources on different 28 types of common problems and ailments in domestic animals and poultry. Gastro intestinal, respiratory, reproductive, urogenital, muscular, skeletal, physical trauma and parasitic diseases were found to be corrected by utilizing the given plant bio resources. Not only they applied the plants, plant parts and extracts for the correction of diseases but also applied to increase the milk production. It was interesting that more than 50% of the plant species were utilized to correct the problems related to digestive system and parasitic infestation (internal and external). People used more than one species for the treatment of same disorder, for example *Acorus calamus* Linn, *Anemone obtusiloba* D. Don, *Artemisia dubia* Wall. ex Besser, *Juniperus recurva* Buch. - Ham. ex D. Don and *Nicotiana tobaccum* Linn. are used to get rid of external parasite. Similarly, few species of plants were used to correct multiple diseases, for example *Acorus calamus* Linn. for respiratory problems (cough) and external parasite as well (Table 1).

Table 1: List of medicinal plants and plant parts used for the treatment of various ailments in animal in Jumla

S.N.	Botanical name	Family	Common name	Parts used	Therapeutic use
1	<i>Acorus calamus</i> Linn.	Araceae	Bojho	rhizome/ leaf	External parasite/Cough (respiratory problem)
2	<i>Allium cepa</i> Linn.	Liliaceae	Pyaj	bulb	Indigestion/anorexia
3	<i>Allium sativum</i> Linn.	Liliaceae	Lasun	bulb	Indigestion/anorexia
4	<i>Anemone obtusiloba</i> D. Don	Ranunculaceae	Maulomuro	root	External parasite
5	<i>Artemisia dubia</i> Wall. ex Besser	Asteraceae	Titepati	leaf	External parasite
6	<i>Bennincasa hispida</i> Linn.	Cucurbitaceae	Kupindo*	fruit	Abortion
7	<i>Bergenia ciliata</i> (Haw.) Sternb.	Saxifragaceae	Simpadi	root	Diarrhea/dysentery
8	<i>Betula utilis</i> D. Don	Betulaceae	Bhojpatra	bark	Sprain/internal pain
9	<i>Bistorta milletti</i> H.Lev.	Polygonaceae	Myakuro	root	Diarrhea/dysentery
10	<i>Brassica sp</i>	Brassicaceae	Choto	root	Bloat/tympani
11	<i>Cannabis sativa</i> Linn.	Canabinaceae	Ganja	leaf	Diarrhea/cold
12	<i>Cedrus deodara</i> (Roxb.ex D.Don) G.Don	Pinaceae	Diyar	oil/resin	External parasite
13	<i>Citrus medica</i> Linn.	Rutaceae	Chuk*	fruit	Poisoning
14	<i>Cucumis melo</i> Linn.	Cucurbitaceae	Aulekaddu*	seed	Abortion
15	<i>Curcuma longa</i> Linn.	Zingiberaceae	Besar*	rhizome	External wound
16	<i>Ocimum sanctum</i>	Lamiaceae	Tulasi	leaves	Cough

17	<i>Fagopyrum esculentum</i> Moench	Polygonaceae	Phapar	seed flour	Cataract/ Retention of placenta
18	<i>Ephedra gerardiana</i>	Ephedraceae	Somlata	stem	Cough
19	<i>Foeniculum vulgare</i>		Sonf	leaves	Indigestion/anorexia
20	<i>Gerbera gossypina</i> (Royle) Beauverd	Asteraceae	Jhullo	root	Internal parasite (Liver fluke, worms)
21	<i>Hippophae salicifolia</i> D. Don	Rhamnaceae	Dalechuk	fruit	Anthelmintic
22	<i>Juniperus recurva</i> Buch.-Ham. ex D. Don	Pinaceae	Dhupi	leaves	External parasite
23	<i>Lavatera kashmiriana</i> Cambess.	Malvaceae	Majaino	leaves	Agalactia
24	<i>Litsea cubeba</i> (Lour.) Pers.	Lauraceae	Siltimur*	seed	Colic
25	<i>Neopicrorhiza scrophulariifolia</i> (Pennell) Hong	Scrophulariaceae	Tito- Kutki	root	Internal parasites/Cough (respiratory problem)
26	<i>Nicotiana tobaccum</i> Linn.	Solanaceae	Kachopat	leaf	External parasite
27	<i>Oryria digyna</i>	Polygonaceae	Ragatmudo	whole plant	Swelling/internal wound
28	<i>Phaseolus radiatus</i> Linn.	Leguminosae	Mass	seed flour	Fracture of limbs/Foot and mouth disease (FMD)
29	<i>Pinus wallichiana</i> A.B.Jackson	Pinaceae	Salla	resin/stem	Sprain/internal pain
30	<i>Piper nigrum</i>	Piperaceae	Marich*	fruit	Cataract
31	<i>Pleurospermum benthamii</i> (DC.) C.B.Clarke	Apiaceae	Ganyaino	root	Colic
32	<i>Pyrus pashia</i> Buch.-Ham. ex D. Don	Rosaceae	Mayal	fruit	Constipation/ Cataract
33	<i>Rheum australe</i> D. Don	Polygonaceae	Padamchal	root/stem	Sprain/fracture
34	<i>Rhus wallichii</i>	Anacardiaceae	Bhakimlo	fruit	Constipation
35	<i>Rubia cordifolia</i>	Rubiaceae	Majitho	stem	Liver diseases
36	<i>Sesamum indicum</i> Linn.	Pedaliaceae	Tel	seed oil	External wound
37	<i>Stephania gracilenta</i> Miers	Menispermaceae	Biralkano	root	Swelling
38	<i>Swertia chirayita</i> (Roxb. ex. fleming) Karstrn	Gentianaceae	Chirayito	root/stem	Anthelmintic
39	<i>Tanacetum dolichophyllum</i> Kitam.	Asteraceae	Baijadi	root	Indigestion
40	<i>Trillidium govanianum</i> (D.Don) Kunth	Liliaceae	Satuwa	root	External wound/Poisoning (plant poisons)
41	<i>Zanthoxylum armatum</i> DC.	Rutaceae	Timur	fruit	Leeches in nostrils
42	<i>Zingiber officinale</i>	Zingiberaceae	Kachur	root	Appetizer

(Source: Field survey, group discussion, 2014); * indicates the resources not produced in the district

DISCUSSION

Ethno botanical and ethno veterinary knowledge and practice of local people

Traditional knowledge and practice on correcting various ailments in domestic animals utilizing plants, their parts and extract are more relevant where modern medicines and veterinary services are not available. Documentation of those plants and traditional knowledge and skills not only transfers the useful information to successors but also enriches the cultural values. Some of the medicinal plants among 58 species recorded from Humla districts by Sapkota (2001) were also among the present study. These facts indicate that Karnali region is an important habitat with meaningful utilization of medicinal plants as traditional skills for ethno veterinary practice. Furthermore, Bharati and Sharma (2008) mentioned 6 plants out of 42 from the present study used as ethno veterinary medicine in Sikkim. Again, Moreki, 2012 mentioned 3 species of medicinal plants within the list of present study, commonly used for the treatment of poultry ailments in Botswana. So, an ethno veterinary medical value of 42 plant species mentioned by Jumli people can be established easily.

Harvesting skill for medicinal plants demonstrated by local people of Jumla in this study strongly supports the sustainable use of medicinal plants. Harvesting leaf, fruit, bulb, seed and bark in most of the documented species, was more sustainable method than harvesting roots or whole plant. Ethno veterinary practice using plant bio resources in Jumla leads to the positive impact of those resources. In another hand, harvesting roots from natural habitats of remaining 35% of the enlisted plants challenges the sustainable way of conservation. The present finding on harvesting method supports the findings of Bhattarai & Croucher (1996) where they mentioned that harvesting of non-timber forest products (NTFP) could have a positive or negative impact on the conservation of biodiversity. Present study indicates the needs of awareness campaign to local people on scientific conservation and harvesting technologies on harvesting the medicinal plants.

Knowledge on ethno veterinary practice not only explores the common ailments found on domestic animals of the district but also gives the choice or alternatives for using plant species on traditional treatment of those ailments. Problems of digestive system including internal parasite and external parasites were found to be more common with respect to the treatment applied by local people. General observation on health service delivery pattern of local agro vet shops also indicates that there is high demand of anti-parasitic medicines (Neupane, 2014. personal communication). District Livestock Service Office, Jumla also allocated about 66% of its total medicine budget for anti-parasitic medicines in fiscal year 2071/72 (DLSO,2014). Ethno veterinary medical knowledge expressed by local people suggests that, one type of disease can be cured by different types of plants and one type of plant cures more than one type of diseases. This practice is also confirmed by Manandhar (2001) and reported that, 16 species were used to treat wounds, 5 for dislocation of bone whereas 9 species were valued for diarrhea and dysentery. It explores the possibilities of utilizing different types of plant resources found in different geographical locations. To fulfill the gap between scientific validation and present knowledge on ethno veterinary practice of local people is need of the hour.

CONCLUSION

It is concluded that there are many plant resources from which farmers prepare medicines to correct various ailments of domestic animals in Jumla as ethno veterinary medicines. Jumla is rich not only in flora and fauna but also in traditional knowledge and practice in ethno veterinary medicine and ethno botanical as well. This traditional knowledge to treat the common diseases of animals is important where the modern veterinary services are not in access. The scope of documented plant species from this study not only limits to ethno medicine, they can be used to prepare the herbal veterinary medicine commercially. Harvesting sustainably and validate the ethno veterinary medical use of the medicinal plants scientifically are the challenging issues coming up. So, it is the need of hour to conserve and promote such useful and valuable traditional knowledge, practice and local resources for livestock development and related value chains.

ACKNOWLEDGEMENT

We are grateful to the local people and traditional healers of Jumla (Sinja and Chaudhabis area) who provided valuable information on the uses of plant resources found in the regions for the treatment and cure of different ailments in animals. Thanks are due to Mr. Gobinda Bahadur Mahat and other staffs of District Livestock Service Office Jumla for their valuable efforts during information collection. The authors highly acknowledge to Gaurav Parmar, research officer, National Herbarium and Plant Laboratories, Godawari for his help during the preparation of this manuscript.

REFERENCES

- Anonymous, (2007). Medicinal Plants of Nepal (Revised). *Bulletin of the Department of Plant Resources* no.28. Department of Plant Resources, Thapathali, Kathmandu, Nepal.
- Bharati, K.A. and Sharma, B.L. (2012). *Plants used as Ethnoveterinary Medicines in Sikkim*. Himalayas Ethnobotany Research & Applications **10**:339-356
- Bhattarai, N. and Karki, M. (2006). *Community management of medicinal plants in Nepal: Practices and trends towards sustainability*: Paper presented at Workshop on accessing the sustainable yields in Medicinal and aromatic plant collection; 14-17 September 2006, ICIMOD, Kathmandu, Nepal.
- Bhattarai, N.K. and Croucher, J. (1996). *Viability of local commercialization of non-timber forest products as a strategy for promoting Biodiversity conservation*. In: P.K. Jha, G.P.S. Ghimire, S.B. Karmacharya, S.R. Baral and P. Lacoul (Eds.). Environment and biodiversity in the context of South Asia. Ecological Society, Kathmandu, Nepal. pp. 346-353.
- DLSO (2014). Annual Progress Report, 2071/72. District Livestock Service Office Jumla.
- German Development Cooperation (GIZ, 2011). *Medicinal and aromatic plants: Poverty impact assessment of proposed trade support measures in Nepal's MAPs sector*. Kathmandu, GIZ.
- Hassan, M.K., Gato, P. and Jha, P.K. (2013). Can environmental income from wild medicinal plants contributes to annual household incomes: a case study from Makwanpur District in Nepal. *International Journal of Medicinal and Aromatic Plants*. (Research article), **3**(1): 18-26.
- Joshi, D.D. (1991). *Traditional veterinary medicine in Nepal*. FAO/APHCA publication, no. 10. FAO Regional Office for Asia and the Pacific, Bangkok, Thailand

- Manandhar, N.P. (2001). Herbal Veterinary Practices in Nepal. *Nepal Journal of Science and Technology* 3(2001): 65-68
- Manandhar, N.P. (2002). Plants and People of Nepal. Timber Press, Oregon, USA.
- Moreki, J.C. (2012). Use of Ethnoveterinary Medicine in Family Poultry Health Management in Botswana. *A Review J. Vet. Adv.* 2(6):254-260
- Paudel, H.R. (2013). Cultivation technology, Sustainable collection and Management of Important Medicinal Plants of Jumla. District Plant Resources Office, Jumla, Nepal.
- Rokaya, M.B., Kurumbang, N and Ghimire, S.K. (2006). Local Use and Conservation Status of Medicinal Plants Upper Dolpo, Nepal. Himalayan Medicinal and Aromatic Plants, Balancing Use and Conservation: *Proceedings of the Regional Workshop on Wise Practices and Experiential Learning in Conservation and Management of Himalayan Medicinal Plants, Kathmandu, Nepal.* Pp. 511-513.
- Sapkota, P.P. (2001). Socio-cultural Condition and Ethno-Botanical Knowledge of Aidiy Community: An Anthropological Case Study of Mimi VDC Humla, Nepal. A Dissertation Submitted to the Department of Sociology/Anthropology. Tri-chandra Multiple Campus, Kathmandu, Nepal.
- Shrestha, K.K., Tiwari, N.N. and Ghimire, S.K. (2000). Medicinal and aromatic plants database of Nepal (MAPDON). *Proceeding of Nepal-Japan Joint Symposium on Conservation and Utilization of Himalayan Medicinal Plant Resources, Kathmandu, Nepal.* 53-74.
- Subedi, B.P. (2000). Policy and Regulatory Environment for the Conservation and Utilization of Himalayan Medicinal Resources in Nepal. A paper presented for the workshop on “Nepal Japan Joint Symposium on Conservation and Utilization of the Himalayan Medicinal Resources” organized by Department of Plant Resources (HMG, Nepal) and Society for Conservation and Development of Himalayan Medicinal Resources, Japan, 8-10 November 2000, Kathmandu, Nepal, p. 13.