ETHNOBOTANICAL SURVEY OF MEDICINAL PLANTS TRADED IN THE STREETS OF KATHMANDU VALLEY

Kamal Prasad Acharya and **Maan B. Rokaya**

Abstract: A field survey was conducted in four different places of Kathmandu valley during the different seasons in 2003-2004. Thirty six medicinal plants belonging to 28 families and 35 genera were reported, each with local names, traditional uses and places of trading. The people used plant species for treating various kinds of ailments such as diarrhoea, stomachache, gastritis, jaundice, bodyache, bleeding, tonic etc. For the purposes to treat the diseases, various forms of preparation are used. The most popular medicinal preparations are in powder, paste, decoction and juice. Although the people are subjected to the modern facilities, the present results indicate that inhabitants of Kathmandu valley still rely on traditional medicines for their primary health care needs.

Key words: *Ethnomedicine; vendor; Kathmandu.*

INTRODUCTION

Nepal is well known for its high biological and cultural diversities. Variations in physiographic structures and climate have enriched the country with a high diversity of flora, fauna, ecosystem and cultural heritage (Chaudhary, 1998). The total number of flowering plants so far documented from Nepal figures 6501 taxa with 5636 species, 206 subspecies; 599 varieties and 60 forma (DPR, 2001). Among these about 396 species of flora are endemic to Nepal (Joshi & Joshi, 1991; Shrestha & Joshi, 1996; Chaudhary, 1998). These plants have become the important source of medicine for the local healers as well as the basic raw materials for Ayurvedic, homeopathic and allopathic medicines (Ghimire *et al.,* 1999). It has been estimated that approximately 80 percentage of the developing world depend on traditional medicines (Sheldon *et al.,* 1997).

The use of plants products as medicine could be traced as far back as the beginning of human civilization. The earliest documentation of medicinal plants in Hindu culture is found in "Rigveda", which is said to have been written between 4500 B.C. and 1600 B.C. and is supposed to be the oldest repository of human knowledge that has described 67 plants (Malla and Shakya, 1984). Biodiversity in Nepal have supported the livelihood of indigenous people who live in different parts of Nepal. Their myths and rituals as well as their traditional environmental practices, depict a close relation between human beings and nature in the world and in Nepal.

Collection and trade of medicinal plants to India has become a historical fact (Shrestha, 1994; Ghimire *et al.,* 2001). In fact, this traditional practice of trade in most of the high hill districts of the country has become an important source of income generation. The trade of Non-timber forest products is ancient: the earliest reference is probably over 3000 years in Sanskrit legend *Ramayan* (Edwards, 1996). Since then the trade of plants has contributed a lot in Nepal's economy and Olsen (1998, 1999) estimated that 470,000 households are involved in commercial plant collection in Nepal and the annual export value of approximately 22-70 million US$ has sustained the life of vast population. At present, wild and useful medicinal plants are highly threatened due to over and unsustainable harvesting for trade, habitat destruction, human encroachment and application of inappropriate technologies. In order to conserve the species that have become vulnerable, threatened and endangered various measures are under implementation. Despite these efforts, there are still less information regarding the uses of medicinal plants. Therefore, present attempt has been made to collect ethnobotanical information on plants sold in different places inside Kathmandu valley of Nepal.

METHODOLOGY

The study was carried out in four different places of Kathmandu valley. They were New Bus Park in northwest, Gaushala and New Baneshwor in the northeast direction of Kathmandu, Sahid Gate and near New Road gate in the centre of Kathmandu valley. The authors conducted surveys for the collection of specimens during the different seasons in 2003-2004. Ethnobotanical information was collected by using standard techniques such as direct interview, direct observation and discussion with traders (mostly Tamangs from Banepa and Panauti) and clients (Martin, 1995; Cunningham, 2001). The documented information was verified by cross-questioning the people at different places and going through relevant literatures (Joshi & Joshi, 2001; Lama *et al*., 2001; Rajbhandari, 2001; Manandhar, 2002; Rokaya, 2002; Joshi *et al*., 2003) The voucher

Author for Correspondence: Kamal Prasad Acharya, P.O.Box 15142 KPC 676, Kathmandu, Nepal. E-mail: acharya.kamal@gmail.com.

specimens were identified with the help of standard literature (Hooker, 1872-1897; Hara & Williams, 1979; Hara *et al.*, 1978, 1982; Polunin & Stainton, 1984; Press *et al.*, 2000) and cross-checking with specimens of Tribhuvan University Central Herbarium (TUCH), Kirtipur. The specimens are deposited at TUCH.

RESULTS AND DISCUSSION

The result of the field study has been presented in Table 1, where species are listed alphabetically by family and genus-species together with collection number, their local name, uses, parts used and places of availability in Kathmandu valley. Ethnobotanical information of 36 species of plants belonging to 35 genera and 28 families has been collected form the different study sites. Out of total species, only eight species were documented from all the places of the study sites and they are *Acorus calamus, Swertia chirayita, Glycyrrhiza glabra, Indigofera pulchella, Azadirachata indica, Rheum australe, Bergenia ciliata* and *Astilbe rivularis*. Analysis of data shows that 12 species are used for gastro-intestinal problems, 6 species for cuts and wounds, 1 species each for mumps, antihelmintic, facial ointment, dental problem, burns, blood clotting and hair tonic. Beside the medicinal uses 1 species is used as avoiding bitter taste and 1 as spices during pregnancy for its sour taste (Table 1). For the purposes to treat the diseases, various forms of preparation were used. The most popular medicinal preparations were in powder, paste, decoction and juice.

Table 1: List of medicinal plants with their uses and their availability at different places in Kathmandu valley

FAMILY/SPECIES (COLLECTION NO.)	LOCAL NAME	USES	PARTS USED	NEW BUS PARK	GA US ALA	NEW BANES HWOR	SAHID GATE	NEAR NEW ROAD GATE
AMARYLLIDACEAE *Crinum amoenum* Roxb. ex Ker Gawl. (KM 23)	Hade lasun	The paste of under ground part is used in abscess/ dehydration in boil (Pilo ko lagi)	Bulb		+			
ARACEAE *Acorus calamus* L. (KM 27)	Bojo	Roots are chewed to cure cough (Khoki)	Root	+	+	+	+	+
ASCLEPIADACEAE *Ceropegia pubescens* Wall. (KM 42)	Bhirke lahara	The powder or paste of the bark is used to reduce sugar level (Madhumeha)	Bark	+			+	
ASPIDIACEAE *Dryoathyrium boryanum* (Wild.) Cheng (KM 16)	Kalo Nieuro	The powder or paste is used to treat dysentery	Root	+				+
BERBERIDACEAE *Berberis aristata* DC. (KM18)	Chutro	Decoction of roots is used to treat Jaundice.	Root	+	+			
CARYOPHYLLACEAE *Drymaria diandra* Blume (KM 8)	Avijalo	Paste is used for Typhoid and diarrhoea	Whole plant		+	+		
COMBRETACEAE *Terminalia bellirica* (Gaertn.)Roxb. (KM 7)	Barro	One of the constituents of Triphala which is used for gastritis in form of power.	Fruit	+			+	+
COMBRETACEAE *Terminalia chebula* Retz. (KM 9)	Harro	The powder is used as one of the constituents of Triphala that is used for gastritis	Fruit	+	+	+		
CONVOLVULACEAE *Poranopsis paniculata* (Roxb.) Roberly (KM 54)	Sikari lahara	The paste or powder is used to minimize severe pain in the body.	Stem		+		+	+
CUCURBITACEAE *Coccinia grandis* (L.) Voigt (KM 3)	Golkakro	The paste of under ground part is used to treat wound	Tuber or root			+		+
EUPHORBIACEAE *Phyllanthus emblica* L. (KM 5)	Amala	One of the constituents of Triphala which is used for gastritis in form of power.	Fruit	+			+	+
FABACEAE *Pterocarpus marsupium* Roxb. (KM 2)	Bijaya Sal	The paste of the stem is used in case of tingling (Jham Jham Garne) or neurological problem	Stem					+
GENTIANACEAE *Swertia chirayita* (Roxb. ex Fleming) H.Karst. (KM 6)	Chiraita	The powder of the whole plant is used in fever	Whole plant	+	+	+	+	+
GUTTIFERAE *Mesua ferra* L. (KM 21)	Nageshwori	The paste is used in wounds as well as to prevent from snakes in homes	Fruits, Stem	+	+			
LEGUMINOSAE *Glycyrrhiza glabra* L. (KM 28)	Jethi Madhu	The powder is taken for cough and problem in throat (Ghati ma samassya huda)	Stem	+	+	+	+	+
LEGUMINOSAE *Dalbergia latifolia* Roxb. (KM 35)	Satisal	The decoction of the roots or wood is used for bodyache.	Root, Bark			+		

LEGUMINOSAE *Entada phaseoloides* (L.) Merr. (KM 48)	Lekpangra	Power of fruit is used for tonsillitis, Mumps and Jaundice	Fruit	+	+	+		
LEGUMINOSAE *Indigofera pulchella* Roxb. (KM 12)	Mirmire lahara	Decoction of roots is used in weakness, Jaundice which is better than *Cuscuta* sp.	Root	+	+	+	+	+
LILIACEAE *Asparagus racemosus* Wild. (KM 17)	Kurilo (Satabari)	The powder or decoction of roots is used as warm relief (Garmi ko lagi)	Root		+			
LILIACEAE *Paris polyphylla* Sm. (KM 51)	Satuwa	Paste of rhizome is used in wounds and expulsion of poison	Rhizome				+	+
MELIACEAE *Azadirachta indica* A. Juss. (KM 53)	Neem	Decoction of leaves is used to reduce sugar level, bark in antihelmintic and cures ulcer and relives cough	Leaf	+	+	+	+	+
MENISPERMACEAE *Stephania glandulifera* Miers. (KM 39)	Gudar gano	The powder or decoction is used to treat stomach ache or gastritis	Root	+	+			+
MENISPERMACEAE *Tinospora sinensis* (Lour.) Merr. (KM 38)	Gurjo	The under ground part is chewed to relieve bitter taste. Decoction of bulb is used to treat stomachic, in fever or antipyretic and in chronic diarrhoea	Bulb				+	
ORCHIDACEAE Orchid sp. (KM 60)	Sunakhari	The paste of the pseudobulb is used to clear scars and marks in face (Aanuhar ko chhaya ko lagi)	Pseudo bulb	+			+	+
PARNASSIACEAE *Parnassia nubicola* Wall. ex Royle (KM 57)	Nirmasi	The powder of roots is consumed to remove waste products from body (laxative)	Root				+	+
PIPERACEAE *Piper* sp. (KM 43)	Himali pan	The powder or the paste of roots is used for cough, asthma, tonsilitis and gingivitis (Jibro ma Khatira)	Root	+			+	+
POLYGONACEAE *Rheum australe* D.Don (KM 30)	Padamchal	Powdered roots are used for cleaning teeth, useful in a chronic dyspepsia and also in paste is used in body ache, cuts, burns etc.	Leaf, Rhizome	+	+	+	+	+
ROSACEAE *Rubus ellipticus* Smith (KM 37)	Ainselu	The powder is used to treat gastritis	Root		+	+		
SANTALACEAE *Osyris wightiana* Wall ex Wight (KM 45)	Bijaya Shakti	The paste of roots is used in case of tingling (Jham Jham Garne) or neurological problem	Root		+			
SAXIFRAGACEAE *Astilbe rivularis* Buch.-Ham ex D.Don (KM 46)	Thulo okhati	The powder of the roots is used to reduce bleeding in abortion and body ache, and also used in weakness as tonic	Root	+	+	+	+	+
SAXIFRAGACEAE *Bergenia ciliata* (Haw.) Sternb. (KM 55)	Pakhenbed	The powder of roots is used in diarrhoea, the paste is used as spices during pregnancy.	Rhizome	+	+	+	+	+
UMBELLIFERAE *Selinum wallichianum* (DC.) Raizada & Saxena (KM 22)	Bhutkesh	The powder of roots are used in cough and cold.	Root		+	+	+	
URTICACEAE *Dendrocnide sinuate* (Blume) Chew (KM 58)	Marrange	The paste of Stem is used in hair to make it long and black	Stem			+		+
VALERIANACEAE *Valeriana jatamansii* Jones (KM 14)	Sugandhwal	The powder of roots is used in nervous unrest and emotional trouble as carminative, sedative. It is used to remove burn (Garmi ko lagi)	Rhizome	+		+	+	+
ZINGIBERACEAE *Cautleya spicata* (Sm.) Baker in Hook (KM 25)	Pani saro	The power of the bulb is used for gastritis.	Bulb		+	+		
ZINGIBERACEAE *Curcuma angustifolia* Roxb. (KM 32)	Haledo	The powder of roots is used to treat fever and to expel waste products from body (Bigar ko lagi)	Root	+		+		

KM: abbreviation for collection number used by authors in their herbarium;

+ Sign shows the availability of medicinal plants at different places of Kathmandu valley.

The information and findings presented are primarily based on the interviews taken with the traders and clients in the streets of Kathmandu valley. Although people are subjected to modern facilities, the present results indicate that the inhabitants of Kathmandu valley still rely on traditional medicines for their primary health care needs. This may be because of multi ethnic composition of the population, traditional beliefs and practices that are deeply rooted in their culture. Most of the medicinal plants sold by traders were collected by themselves in their own locality or bought form the primary traders. The trading was done in very low amount in order to have hand to mouth in their daily life. Most of the plant species available were not used alone as medicine but were used by mixing with other herbs in specific amounts. The traders were found selling pseudobulbs of orchids which are included in CITES Appendix II. Therefore, traders must be made aware about the status of medicinal plants that they sell and alternatives should be searched for their livelihood.

CONCLUSION

The present study of plants traded in Kathmandu valley indicates that in spite of the establishment of modern western styled medical centers, traditional practices on the uses of medicinal plants will continue to play a significant role in the socio-cultural life of people. The research in ethnomedical practices, as above, can lead to add the knowledge on new and less known medicinal plants. Therefore, it is essential to conserve such knowledge hidden in the different parts of the country and people should be encouraged to use herbal medicines for the ever increasing requirements of human health care which has less or no side effects.

ACKNOWLEDGMENTS

The authors are very much thankful to Prof. Dr. H.D. Lekhak, Mr. Bharat Babu Shrestha, Central Department of Botany for their valuable suggestion and guidance for the study. Special thank goes to traders namely Mr. Bijaya Gurung (Banepa), Mr. Krishna Bdr. Lama (Panauti), Mr. Bishnu Lama (Ramechhap), Mr. Hari Bdr. Gurung (Panauti) and Sonam Lama (Panauti) for sharing information on medicinal plants with us.

REFERENCES

Chaudhary, R.P. 1998. *Biodiversity in Nepal Status and Conservation,* S. Devi, Saharapur, India and Craftsman Press, Bangkok, Thailand

Cunningham, A.B.2001. *Applied ethnobotany: people, wild plant use and conservation.* A People and Plants Conservation Manual, Earthscan, London, 300pp.

DPR, 2001. *Flowering plants of Nepal (Phanerogams),* His Majesty's Government, Ministry of Forests and Soil Conservation, Department of Plant Resources, Kathmandu, Nepal.

Edwards, D.M. 1996. Non Timber Forest Products (NTFPs) form Nepal: Aspects of trade in Medicinal and aromatic plants. FORESC *Monograph.* Forest Research and Survey Center, Kathmandu, Nepal.

Ghimire, S. K., Y. C. Lama, G. R. Tripathi, S. Schmit and Y. Aumeeruddy-Thomas. 2001. Conservation of the Plant Resources, Community Development and Training in Applied Ethnobotany at Shey Phoksundo National Park and its Buffer-zone, Dolpa. Fourth Year. WWF Nepal Program Report Series No. 41, WWF Nepal Program, Kathmandu, Nepal.

Ghimire, S.K., J.P. Shah, K.K. Shrestha and D. Bajracharya. 1999. Ecological study of some high altitude medicinal and aromatic plants in the Gyasumdo valley, Manang, Nepal. *Ecoprint* **6**(1): 17-25.

Hara, H. and L.H.J. Williams. 1979. *Enumeration of flowering plants of Nepal.* Vol**. 2.** British Museum (Natural History) London.

Hara, H., A.O. Chater and L.H. J. Williams., 1982. *An enumeration of flowering plants of Nepal.* Vol. **3**. British Museum (Natural History) London.

Hara, H., W.T. Stearn and L.H.J. Williams., 1978. *An enumeration of flowering plants of Nepal.* Vol. **1**. British Museum (Natural History) London.

Hooker, J.D. 1872-79. *Flora of British India*. Vol. I-VII. London.

Joshi A. R. and D. P. Joshi 1991. Endemic plants of Nepal Himalaya: conservation status and the future direction. *Mountain Environment and Development,* **1**(2): 71-83.

Joshi, A.R., S.L. Shrestha and K. Joshi. 2003. *Environmental Management and Sustainable Development at the Crossroad.* AnKuS, Kathmandu. pp 302.

Joshi, K.K and S.D. Joshi. 2001. *Genetic Heritage of Medicinal and Aromatic Plants of Nepal Himalayas.* Buddha Academic Publishers and Distributors Pvt. Ltd., Kathmandu, Nepal. pp 239.

Lama, Y.C., S.K. Ghimire and Y. Aumeeruddy-Thomas, 2001. *Medicinal Plants of Dolpo*: *Amchis' Knowledge and Conservation.* WWF Nepal Program, Balawatar, Kathmandu, Nepal. Pp 150.

Malla, S.B. and P.R. Shakya. 1984. Medicinal plants of Nepal. In: T.C. Majupuria (Eds.) *Nepal Nature's Paradise*. White Lotus Ltd., Bangkok, 261-297 pp

Manandhar, N.P. 2002. *People and Plants in Nepal.* Timberland Press, USA.

Martin, G. J. 1995. *Ethnobotany: A people and plants consevation manual.* Chapman and Hall.

Olsen, C.S. 1998. The trade in medicinal plants from Nepal: status and possible improvements. Theme paper presented at the International Conference on Medicinal Plants, Banglore, 16-19 Fegruary, 1998.

Olsen, C.S. 1999. CITES Appendix II revisited: is the listing of *Nardostachys grandiflora* and *Picrorhiza kurroora* appropriate. *Medicinal Plant Conservation.* **5**: 8-10.

Polunin. O and A. Stainton. 1984. *Flowers of the Himalaya.* Oxford University Press. India.

Press, J.R., K.K. Shrestha and D.A. Sutton, 2000. *Annotated Checklist of the Flowering Plants of Nepal*. The Natural History Museum, London.

Rajbhandari, K.R. 2001. *Ethnobotany of Nepal*. Ethnobotanical Society of Nepal (ESON), Kathmandu, Nepal. pp 189.

Rokaya, M.B. 2002. Ethnoecology of Medicinal Plants in Dho-Tarap Area in Buffer Zone of Shey Phoksundo National Park, Dolpa, Nepal. Unpublished M.Sc. dissertation, T.U., Nepal.

Sheldon, J.W.; M.J. Black and S. laird. 1997. *Medicinal plants: can utilization and conservation coexist?* Scientific Publications, The New York Botanical Garden, USA pp. 104.

Shrestha, T.B. 1994. Utilization of non-timber forest products: Medicinal and Aromatic Plants. In: *Proceedings of National Seminar on Non-Timber Forest Products.* Ministry of Forest and Soil Conservation Herbs Production and Processing Co. Ltd., Kathmandu, Nepal. 16-22pp.

Shrestha, T.B. and Joshi, R. M. 1996. *Rare, endemic and endangered plants of Nepal.* WWF Nepal Program, Kathmandu, Nepal.

◆◆◆