Comparative Use Pattern of Medicinal Plant Species Among Eight Ethnic/Caste Groups of Benimanipur VDC, Nawalparasi District

A Dissertation Submitted for the
Partial Fulfilment of the
Masters of Science in Botany

Submitted By
Kanti Prabha Thapa
Exam Roll No.: 1098
T. U.Regd. No.: 5-1-19-130-98

Central Department of Botany
Tribhuvan University, Kirtipur
Kathmandu, Nepal
September 2008

TRIBHUVAN UNIVERSITY

INSTITUTE OF SCIENCE AND TECHNOLOGY

CENTRAL DEPARTMENT OF BOTANY

OFFICE OF THE HEAD OF DEPARTMENT

KIRTIPUR, KATHMANDU
NEPAL

Ref No:

CERTIFICATE

This is to certify that the dissertation work entitled "**Comparative Use Pattern of Medicinal Plant Species Among Eight Ethnic/Caste Groups of Benimanipur VDC, Nawalparasi District**" submitted by **Ms. Kanti Prabha Thapa** has been carried out under my supervision. The entire work is based on the results of her research work and has not been submitted for any other degrees to the best of my knowledge. I recommend this dissertation work to be accepted for the partial fulfilment of Masters of Science in Botany.

Date: 9th Sept., 2008

……..
Ms. Sangeeta Rajbhandary
Supervisor
Central Department of Botany
Tribhuvan University, Kirtipur,
Kathmandu

Phone: 4331322, 4332636, Fax: ++977-1-4333515, Post Box: 26429
E-mail: info@cdbtu.edu.np, Webpage: www.cdbtu.edu.np

TRIBHUVAN UNIVERSITY

INSTITUTE OF SCIENCE AND TECHNOLOGY

CENTRAL DEPARTMENT OF BOTANY

OFFICE OF THE HEAD OF DEPARTMENT

KIRTIPUR, KATHMANDU
NEPAL

Ref. No.

APPROVAL LETTER

The dissertation work submitted by **Ms. Kanti Prabha Thapa** entitled "**Comparative Use Pattern of Medicinal Plant Species Among Eight Ethnic/Caste Groups of Benimanipur VDC, Nawalparasi District**" has been accepted as a partial fulfillment of M. Sc. in Botany.

EXPERT COMMITTEE

……	……
Research Supervisor	Head
Ms. Sangeeta Rajbhandary	**Prof. Dr. Krishna Kumar Shrestha**
Central Department of Botany	Central Department of Botany
Tribhuvan University	Tribhuvan University
……	……
Internal Examiner	External Examiner
Dr. Suresh Kumar Ghimire	**Dr. Keshav Shrestha**
Central Department of Botany	Natural History Museum
Tribhuvan University	Swayambhu. Kathmandu, Nepal

Date of Examination: 22 Sept. 2008

Phone: 4331322, 4332636, Fax: ++977-1-4333515, Post Box: 26429
E-mail: info@cdbtu.edu.np, Webpage: www.cdbtu.edu.np

ACKNOWLEDGEMENT

There are a number of people to whom I owe immense thanks for their valuable suggestion, guidance, encouragement and inspiration for this dissertation work. Without their help it would not have been possible to complete.

I am grateful to my respected supervisor Ms. Sangeeta Rajbhandary, Lecturer, Central Department of Botany, who gave me continuous suggestion and encouragement for completion of this dissertation work. Her effective guidance, frequent monitoring and constant input during this work made this thesis in this form. I am also thankful to her for giving suggestion in photography and identification of some plants.

I would like to express my sincere gratitude to Prof. Dr. Krishna Kumar Shrestha, Head of Central Department of Botany, who gave the valuable suggestion, inspiration for this dissertation work and also for identification of plant specimen that has been collected from study area.

I am much thankful to Prof. Dr. Ram Prasad Chaudhary for his kind help and providing the book related to ethnobotany and suggestion to complete this dissertation work. I am also grateful to Dr. Suresh Kumar Ghimire, Lecturer, Central Department of Botany for his kind help and valuable advises. I am also thankful to Dr. Narendra Nath Tiwari for his valuable suggestion.

I would like to thank Mr. Prem Chhetri and Mrs. Narayani Lamichhane, social workers, for their kind information and suggestion about the study area. My sincere acknowledgement goes to the local people of the study area especially to Mr. Toyanath Pandey, Mr. Bhimnarayan Chaudhary, Mrs. Dil Maya Ale, Mr. Sachidananda K.C., Mr. Surya Bahadur Pandey, Mr. Dhanapati Pandey and Mrs. Archana pandey, etc. for accompanying me during the field visit. I am also thankful to Mr. Ripu Kunwar for providing literatures and articles.

I would like to express my sincere thank to my intimate friend Mr. Munesh Ratna Gubhaju for helping me in the field visit and also for photography as well as typing this thesis. I would like to thank Mrs. Afrin Gurung for translating the local equivalents into medicinal terms. I would like to thank Mr. Balak Devkota, Mr. Jyoti Parsad Gajurel, Mr. Kamal Humagain, Mr. Kapil Adhikari, Ms. Saroj Yadav, Mr. Chandrakant Chaudhary and Mr. Sailesh Ranjitkar for their indirect help during the completion of the work.

September, 2008 Kanti P. Thapa

GLOSSARY OF SOME TERMS USED IN THE TEXT

Dhami/Jhankri	:	Local traditional healers especially from Brahman/Chhetri groups
Guruwas	:	Local traditional healers especially from Tharu group
Jyotish	:	Those who study about the human behaviour by taking references of planetary motion
Lama	:	Local priest

LIST OF ACRONYMS

ANSAB	Asia Network for Small Scale Bio-resources
CAMP	Conservation Assessment and Management Plan
CBS	Central Bureau of Statistics
CITES	Convention on International Trade in Endangered Species of Wild Flora and Fauna
DFRS	Department of Forest Resource and Survey
DNPWC	Department of National Parks and Wildlife Conservation
ESON	Ethnobotanical Society of Nepal
GoN	Government of Nepal
HMG/N	His Majesty Government on Nepal
IDRC	International Development Research Centre
INGO	International Non- Government Organization
IUCN	International Union for Conservation of Nature
KATH	National Herbarium and Plant Laboratories, Godawari
MAP	Medicinal and Aromatic Plants
MAPPA	Medicinal and Aromatic Plants Programme in Asia
MFSC	Ministry of Forest and Soil Conservation
NAST	Nepal Academy of Science and Technology
NGO	Non-Government Organization
RBNP	Royal Bardiya National Park
TU	Tribhuvan University
TUCH	Tribhuvan University Central Herbarium
UNESCO	United Nation Educational Society and Cultural Organization
VDC	Village Development Committee
WWF	World Wide Fund for Nature

LIST OF TABLES

Table 1 : Medicinal plant use pattern among eight different ethnic/caste groups 33

Table 2 : Comparison of medicinal uses of plants between the present finding and previous works 62

Table 3 : Usage categories, the number of medicinal plant species used for each specific usage and use report for each specific usage 65

Table 4 : Informants consensus factor (F_{ic}) for each usage category 78

Table 5 : Plant species to be conserved in Benimanipur VDC 80

LIST OF FIGURES

Figure 1: Map of the study area 16

Figure 2: Climatic data of Simari 17

Figure 3: Ethnic/caste group composition 19

Figure 4: Most dominant plant families in study area 31

Figure 5: Growth forms of medicinal plants 32

Figure 6: Ethnomedicinal Knowledge variation among eight ethnic/caste groups 56

Figure 7: Oral mode of use of medicinal plants 57

Figure 8: Mode of use of medicinal plants (Applied) 57

Figure 9: Percentage of parts used of medicinal plants 58

Figure 10: Number of common plants used by ethnic/caste groups 59

Figure 11: Knowledge variation in multiple uses of plants among eight ethnic/caste groups 60

Figure 12: Number of common plants reported to treat common disease 61

Figure 13: Relationship between ethnographic validity and number of plants used 62

Figure 14: Distribution of medicinal plant species among 19 usage category 77

Figure 15: Use report among 19 usage category 77

Figure 16: Ailments with the high number of use-report along with number of taxa 79

LIST OF FLOW CHART

Flow Chart 1: Methodology 29

Flow Chart 2: Prioritized medicinal plants species for conservation in Benimanipur VDC 82

LIST OF PHOTOS

Photo 1:	Village boundary on northern side	15
Photo 2:	Vegetation of the study area	18
Photo 3:	Information on cross check with local informant	23

SUMMARY

The present study has been undertaken in Benimanipur VDC of Nawalparasi district which is very rich in floral composition. No ethnobotanical study has been under taken previously in this area. This study mainly focused on documentation of traditional knowledge on the use of medicinal plants among eight major ethnic/caste groups in the study area.

Ethnobotany is the science that deals with documentation of traditional knowledge of local people on the use of plants for a wide diversity of primary survival and aesthetic purposes. It investigates human interaction with plants and their ecosystem. The primary aim of present study was to document information about the medicinal practice of various plants to cure various ailments among eight major ethnic/caste groups *viz.* Brahman, Chhetri, Tharu, Magar, Newar, Kumal, Dalit and Gurung. The study also includes the multiple uses of medicinal plants among these ethnic/caste groups. Altogether 170 plants of medicinal values belonging to 138 genera and 64 families have been recorded from the study area among which Leguminosae was found most frequent i.e. including 18 plant species. Most of the medicinal plants found in study area were of wild occurrence. These plant species were evaluated in terms of parts use category, habit category, mode of use category, disease use category, ethnographic validity with their medicinal use pattern and multiple uses, number of use report, and number of taxa use to treat different ailments. These medicinal plants were documented with their scientific name, local name, community name (available), English name, family, form, category of plants, flowering, fruiting, distribution in Nepal, distribution in world, and collection number of some collected specimens. The people of study area were found mostly dependent upon forest and forest products. Due to their long experience and practices on utilization of forest products, they had acquired rich knowledge about use of plants for various purposes. Especially local faith healers, Guruwas, Lama and elderly people had rich knowledge about traditional use of medicinal plants. Women of the study area had rich knowledge on use of plants for different purposes. In this study Dalit were found to have high knowledge on medicinal use of plants in comparison with other ethnic/caste groups while Tharu had high knowledge about multiple uses of these medicinal plant in comparison to other ethnic/caste groups. Among 170 medicinal plants, 49 species of medicinal plants

were used by all ethnic/caste groups to treat different diseases/disorders and 12 common plants were used to treat 9 common diseases/disorders by all ethnic/caste groups. The total medicinal plants studied were used to treat 122 ailments which were categorized into 19 disease usage category in which 17 usage category had already given by Cook (1995) and 2 are additional usage category in this study. In this study, data were analyzed by using two methods, the first one is Ethnographic Validity (EV) and the second one is Informant Consensus Factor (ICF). In the first method of data analysis, 10 plants had very high validity (>300) for different diseases/disorders among them the plants *Aloe vera* has high ethnographic validity for burns i.e. 416.94. Similarly 25 plants have high ethnographic validity, 29 plants (with 3 repeated plant species) have medium validity and 702 plant species (with most repeated plant species) have low validity. Out of 64 plant species that have high ethnographic validity, comparative study with previous finding was done of only 22 plant species. In ICF method 'Animal problem' (ANP) and 'Poison' (POI) both had highest F_{ic} value i.e. 0.87 in comparison with remaining 17 usage categories. Among 19 usage category 9 usage category had F_{ic} value ≥ 0.70. 15 plant species are need to conserve among total plant species studied in Benimanipur VDC in which 4 plant species are already in threat list in Nepal. They are *Alstonia scholaris, Asparagus racemosus, Curculigo orchioides* and *Rauvolfia serpentina* which were kept in threat category by IUCN and CAMP while *Rauvolfia serpentine* is kept by CITES and MFSC as conserving plant.

Key words: *Ethnobotany, diseases/disorders, ethnographic validity, Informant Consensus Factor, Guruwas, Lama*

TABLE OF CONTENTS

Acknowledgement

Glossary of Some Terms Used in the Text

List of Acronyms

List of Tables

List of Figures

List of Flow Chart

List of Photos

Summary

CHAPTER I **1-7**

1. INTRODUCTION 1

1.1 Background 1

1.2 Ethnobotany 3

1.3 Status of Medicinal Plant in Nepal 4

1.4 Objectives 6

1.5 Justification of Study 6

1.6 Limitations of Study 7

CHAPTER II **8-14**

2. LITERATURE REVIEW 8

2.1 Ethnobotanical Work done Outside Nepal 8

2.2 Ethnobotanical Work done Inside Nepal 9

CHAPTER III **15-19**

3. DESCRIPTION OF THE STUDY AREA 15

3.1 Geographical Location and Climate 15

3.2 Climate 17
3.3 Vegetation 18
3.4 Ethnic/Caste Composition 18

CHAPTER IV **20-29**

4. MATERIAL AND METHODS 20
4.1 Selection of Research Site 20
4.2 Collection of Ethnobotanical Information 20
4.2.1 Field Visit 21
4.2.2 Interviews and Questionnaire 21
4.2.2.1 PRA (Participatory Rural Appraisal) 22
4.2.2.2 RRA (Rapid Rural Appraisal) 22
4.2.3 Discussion with Traditional Healer (‘Guruwas’) 22
4.2.4 Plant Collection, Herbarium Preparation and Identification 23
4.3 Data analysis 24
4.3.1 Ethnographic Validity 25
4.3.2 Informant Consensus Method (ICF) 25
4.3.2.1 Terminology Used in this Method 27
4.4 Secondary Data 28
4.5 Categorization of Mode of Use 28

CHAPTER V **30-81**

5. RESULT 30
5.1 Ethnobotany 30
5.2 Diversity of Medicinal Plant 31
5.3 Variation in Ethnomedicinal Knowledge among Different Ethnic/Caste Groups 56
5.4 Preference of Medicinal Plant 58
5.5 Multiple Uses of Plants by Different Ethnic/Caste Groups 59
5.6 Common Medicinal Plant Reported to treat Common Disease 60

5.7 Medicinal Plants having high Ethnographic Validity used for Common Disease/Disorder 61
5.8 Indigenous Knowledge and Consensus 64
5.9 Ailments with High Number of use-report along with Number of Taxa Ethnographic Validity of Medicinal Plants 78
5.10 Prioritized Medicinal Plant species for Conservation in Benimanipur VDC 79

CHAPTER VI **82-92**

6. DISCUSSION 82
6.1 General Overview 82
6.2 Diversity of Medicinal Plant 82
6.3 Variation in Ethnomedicinal Knowledge among Different Ethnic/Caste Groups 83
6.4 Multiple Uses of Medicinal Plant 84
6.5 Medicinal Plants having High Ethnographic Validity 85
6.6 Indigenous Knowledge and Consensus 89
6.7 Ailments with Highest Number of use report along with Number of Taxa 91
6.8 Prioritized Medicinal Plant Species for Conservation in Benimanipur VDC Common Plants and Diseases 91

CHAPTER VII **93-95**

7. CONCLUSION 93

CHAPTER VIII **96**

8. RECOMMENDATION 96

REFERENCES **97-106**

APPENDICES

Appendix I	: Climatic Data of Simari	i
Appendix II	: Ethnic/Caste group composition	ii
Appendix III	: Total plants used by eight ethnic/caste group for different purposes	ii
Appendix IV	: Medicinal plant species used for common disease/disorder among eight ethnic/caste groups	ii
Appendix V	: Percentage of respondents in each ethnic/caste group using Medicinal Plant for a common disease/disorder and score of Ethnographic Validity (only very high, high, and medium) for common medicinal use	xv
Appendix VI	: Ailments with the high number of use-report along with number of Taxa	xviii
Appendix VII	: Priotized medicinal plant species	xix
Appendix VIII	: Detail information on Medicinal plant species found in Benimanipur VDC	xxiii
Appendix IX	: A. Quistionnaire	xxxii
	B. Medicinal Use of plants	xxxiii
	C. Multiple Uses of Medicinal Plants	xxxiii
Appendix X	: Name list of Local Informants	xxxiv
Appendix XI	: Local Equivalent of Medicinal Terms	xxxiv

PHOTOPLATES **xxxvi**