

**Richness and Distribution Pattern of Palatable and
Unpalatable Plant Species in Subalpine-Nival Gradient in
Chameliya Valley, North-West Nepal**



A Dissertation Submitted for Partial Fulfillment of the Requirements for the
Master's Degree in Science in Central Department of Botany,
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Submitted by:

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RECOMMENDATION

This is to certify that the M.Sc. dissertation work entitled "**Richness and distribution pattern of palatable, un-palatable and poisonous plant species in subalpine-alpine Gradient in Chamelia Valley, North-West Nepal**" has been submitted by Mr. Santosh Thapa Magar under my supervision. The entire work is totally based on fieldwork. As to my knowledge, the result obtained has not yet been submitted or published for any other academic degree. I therefore, recommend this dissertation work to be accepted as partial fulfillment for Master's Degree in Botany (Plant Systematic and Biodiversity).

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ABSTRACT

Richness and distribution pattern of palatable, un-palatable and poisonous plant species in subalpine-alpine gradient were studied in Api-Nampa Conservation Area (ANCA), upper Chamelia valley, Darchula, Nepal. Plant species were sampled in four mountain summits, along elevation gradient (4000 to 4650 m asl), and having same local climate. Vegetation sampling was carried out applying standard method of Global Observation Research Initiative in Alpine Environment (GLORIA).

The main objective of study was to assess the transhumance system, diversity and distribution of vascular plants, different life forms, bio-geographical patterns and services provided by pastureland under current condition along the elevation gradient. Analysis revealed the unimodal pattern of plant species richness in summits along elevation gradient. Aspect, slope, and substrate types were the major environmental variables that correlated with species richness. As a result of great topographic variation, the study area harbored significant proportion of range restricted and rare plant species. Himalayan endemic species were recorded in highest percentage, followed by species distributed on Pan-Himalayan. Among life form, chamaephytes were dominant, followed by hemicryptophytes. The study area is greatly influenced by Western Himalayan floristic elements with number of unique species recorded in the plant families like Poaceae, Apiaceae, Gentinaceae and Orobanchaceae. Plant resources contributed direct and indirect ecosystem services, among the services, forbs and sedge grasses were the most common usage for plants for livestock farming. Study showed (60.33%) palatable species, (29.60%) un-palatable species and (10.05%) poisonous species. Local people gain about 9.6018 million per year from the ecosystem through livestock farming in the area.

The subalpine-alpine life zone, which bears high proportion of Himalayan endemics, is fragile and may experience decline of variety of such species due to change in the local environmental conditions and if increasing human encroachment is not properly checked. The result of the present study can be used as base line for future monitoring of change in species distribution pattern in alpine-nival zone of Himalaya.

ABBREVIATIONS AND ACRONYMS

$^{\circ}\text{C}$	degree celsius
ANCA	Api-Nampa Conservation Area
asl	above sea level
CCA	cannonical correspondences analysis
DCA	detrended correspondence analysis
<i>et al.</i>	and others
Fig.	Figure
GLORIA	Global Observation Research Initiative in Alpine Environments
GIS	Global Information System
HSP	Highest Summit Point
ICIMOD	International Centre for Integrated Mountain Development
KATH	National Herbarium and Plant Laboratories, Kathmandu
m	Meter
<i>P</i>	Level of significance
RECAST	Research Center for Applied Science and Technology
SAS	Summit Area Section
SD	Standard Deviation
SE	Standard Error
sp.	Species (singular = sp. and plural = spp.)
SPSS	statstical program for social science
TU	Tribhuvan University
TUCH	Tribhuvan University Central Herbarium
VDC	Village Development Committee

