

Floristic Diversity of Angiosperm in Manang and Mustang of Gandaki Province Nepal

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Abstract

The greatest variety and one whose scientific research is most beneficial is floral diversity. Gyasumbdo, Manang, and Annapurna Conservation Area, Mustang listed 490 and 295 vascular plants species belonging to 430 and 265 species of angiosperms to the study of angiosperms in those regions, respectively. Families that were researched in the field included Asteraceae (largest family) with 21 genera and 40 species, Ranunculaceae with 8 genera and 28 species, Rosaceae with 13 genera and 23 species, Orchidaceae with 18 genera and 23 species, Apiaceae with 13 genera and 18 species, Lamiaceae with 13 genera and 17 species in Gyasumbdo while Asteraceae (18 species), Poaceae (17 species), Orchidaceae (16 species), Ranunculaceae (9 species), Asparagaceae (8 species) were found to be dominant in Annapurna Conservation Area. The largest genera in Manang were *Thalictrum* (11 species), *Pedicularis* (9 species), *Carex*, *Saxifraga* and *Primula* with 8 species each likewise that in Mustang recorded was *Impatiens* (5 species), *Rubus* (4 species), *Begonia*, *Berberis* and *Swertia* with 3 species each. The diverse taxonomic classifications of the eastern and western Himalaya of Nepal reflected meeting point in the vast floristic diversity providing a great field of opportunity for the botanist to explore in detail about the research.

Keywords: Asteraceae, Floristic Diversity, Annapurna Conservation Area, Gyasumbdo, Taxonomic Classification

Introduction

The legacy of millions of years of evolution is biodiversity. It is the diversity of life at various biological organizational levels. The intricate interactions between all living things, including tiny species, are what give rise to the immense variety of life on Earth [1]. The Himalayan region is regarded as a biodiversity hotspot with abundant vegetative, community, and floral diversity due to lengthy altitudinal gradients and climate complexity [2]. According to Chapin, human activities are continuously altering the terrestrial, freshwater, and marine ecosystems of the world, and these changes are leading to the extinction of numerous species. Because environmental factors can influence the emergence of several crucial plant forms, life forms are dependent on both genetic and environmental elements [3,4]. The Nepal Himalaya was split into four biogeographic regions by Dobremez: Eastern, Central, Western, and Trans-Himalayan [5]. His trans-Himalayan biogeographic zones included Mustang and Manang. The goal of the biodiversity dialogue is to periodically measure the biodiversity that exists in different parts of the world. Without sufficient knowledge of any region's vegetation, it cannot be accomplished. According to the Convention on Biological Diversity of 1992, one of the world's top priorities is to document biodiversity, which can only be done through substantial botanical research and floristic investigations. The documentation of

all plant species in a specific geographic area is referred to as a floristic survey [6]. To assess the complexity and resources of these forests, it is crucial to comprehend species diversity and distribution patterns. Therefore, floristic studies may offer useful information that can be a source of inspiration for later research. The elevation of the forest is between 2000 and 3300 m asl, with the uneven forest floor. The study area's climate is primarily moderate, ranging from upper subtropical to lower alpine. Monsoon influences the climate, which is temperate at lower elevations and subalpine at higher elevations. High diversity of vascular plants can be found in various locations in Nepal because of topographic and climatic changes [7]. With over 7000 species of vascular plants, 6653 of which are blooming plants, Nepal has a gift for everyone (Poudel).

Materials and Method

Secondary data was used for the preparation of this term paper. The following article was a concern for this paper:

- Floristic Diversity of Vascular Plants in Sikles Region of Annapurna Conservation Area, Nepal Dhruva Khakurel* 2020
- Floristic Diversity of Vascular Plants in Gyasumbdo Valley, Lower Manang, Central Nepal Pratikshya Chalise* 2019

Results and Discussion

In Gyasumbdo, Manang, 430 angiosperm species (357 dicots and 73 monocots) were identified by the study. Like the findings of other studies (Chapagain), the Asteraceae family was the dominating one, with 40 species belonging to 21 genera. Ranunculaceae (28), Rosaceae (23), Orchidaceae (23), Apiaceae (18), Pteridaceae, Lamiaceae, and Fabaceae (17 each) were the genera that came after it [8]. With 11

species, *Thalictrum* was determined to be the largest genus, followed by *Pedicularis* (9), *Carex* (9), *Saxifraga* (8), *Primula* (8), *Potentilla* (7), *Polystichum* (6), *Juncus* (6), *Anaphalis* (6), and *Clematis* (6). This suggests that the Gyasumbdo valley acts as a meeting site for the floristic features of the western and eastern Himalayas as well as the distinctive species native to the eastern and western regions of Nepal.

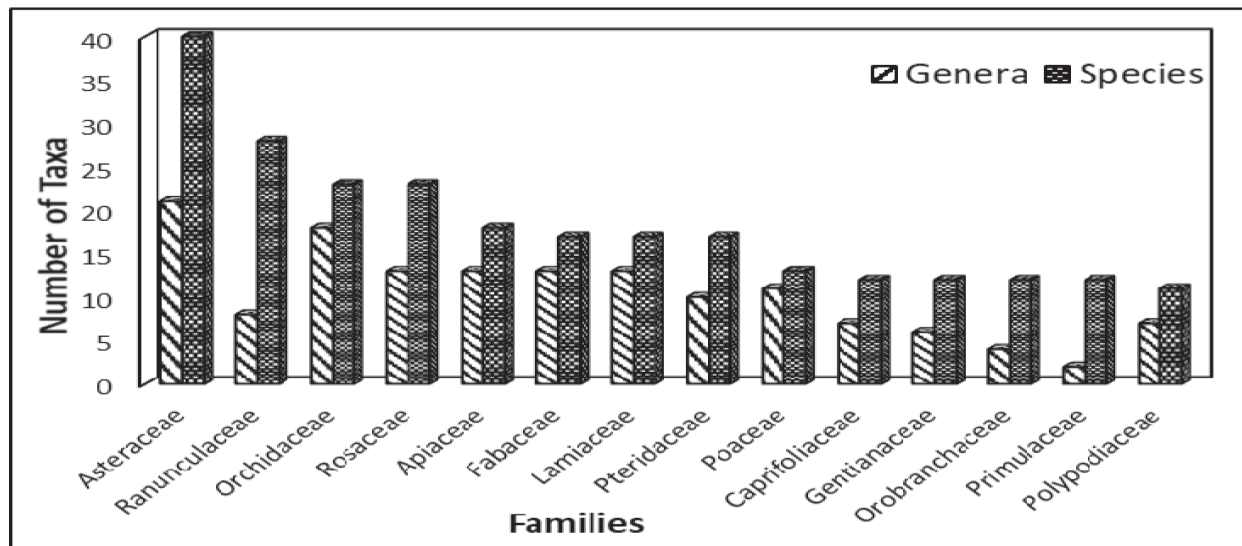


Figure 1: A Bar Diagram Displaying the Most Numerous Vascular Plant Family in Terms of Species and Genera

In terms of species, there were 206 dicots, 59 monocots, 25 ferns, and 5 gymnosperms in the Annapurna conservation area (Figure 2). The two dominant families, Asteraceae and Rosaceae, each had 18 species. Poaceae (17 species), Orchidaceae (16 species), Ranunculaceae (9 species), and Asparagaceae (8 species) were next in number. Other families with the greatest number of species included Polygonaceae, Fabaceae, and Lamiaceae (7 species each) (Figure 3). The current findings are comparable to those of Chalise et al., who found that dicots predominate with the Asteraceae family as the dominating genus in Gyasumbdo Valley Manang, a region inside the Annapurna Conservation Area. The Orchidaceae family was prevalent in Manang, but Poaceae was dominant in the current study, with different results in monocots. Most of the current study area was situated at a higher altitude and were primarily covered with grass with sporadic

Rhododendron campanulatum. Dicots (206 species), the most varied category, were found by floristic analysis to be followed by monocots. In terms of makeup, there are 59 species. With five species, *Impatiens* was the largest genus, and *Rubus* was second with four species. *Swertia*, *Begonia*, and *Berberis* each had three species. According to plant habits, 192 species (65%) were herbs, 50 (17%) were trees, 35 (12%) were shrubs, and 18 (6%) were climbers. In this region, summertime rainfall is very heavy. As a result, the region has a diverse floral composition that includes both Eastern and Western aspects as well as some other rare species. In this region, summertime rainfall is very heavy. As a result, the region has a diverse floral composition that includes both Eastern and Western aspects as well as some other rare species.

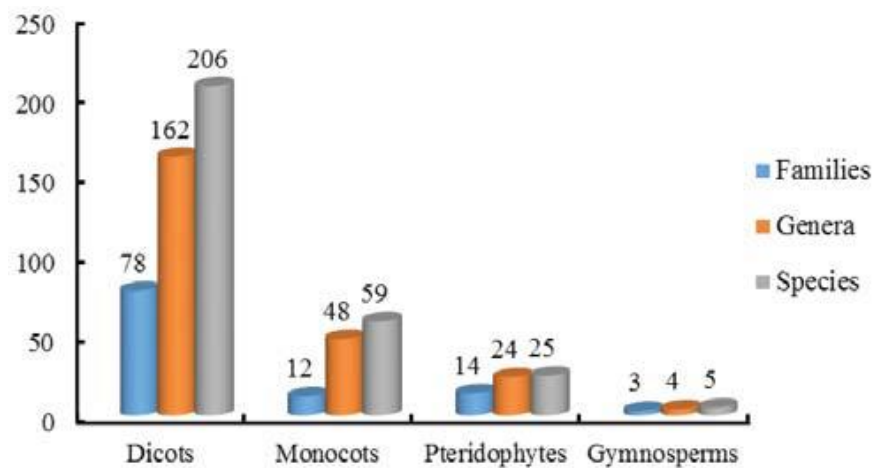


Figure 2: Bar Diagram Showing the Dominant Families of Vascular Plants in Terms of the Number of Genera and Species

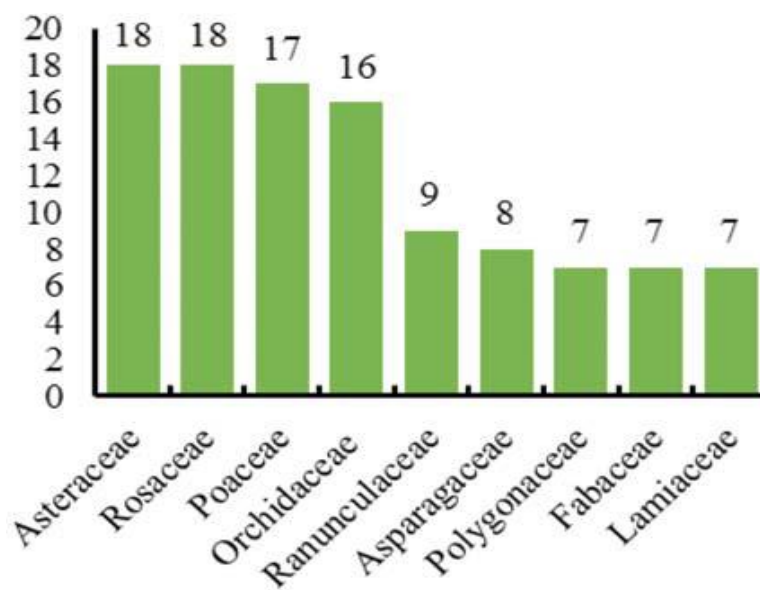


Figure 3: Dominant Families in the Study Area

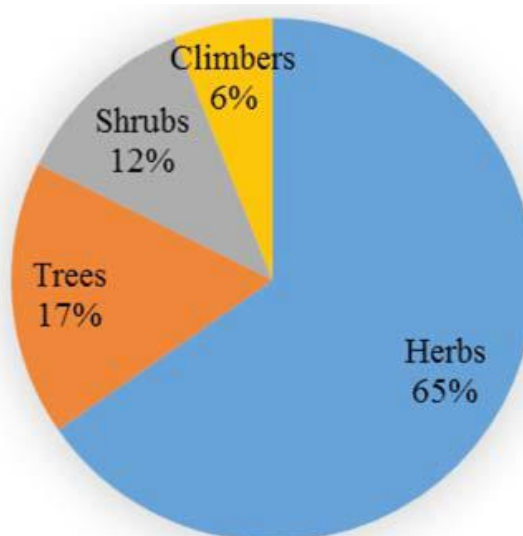


Figure 4: Habits of Plants

S.N	Scientific Name	Family	Habits
1	Pedicularis gracilis Wall. Ex Benth.	Orobanchaceae	
2	Pedicularis hoffmeisteri Klotzsch	Orobanchaceae	
3	Pedicularis megalantha D. Don	Orobanchaceae	
4	Pedicularis mollis Wall. ex Benth.	Orobanchaceae	
5	Pedicularis roylei Maxim.	Orobanchaceae	
6	Pedicularis scullyana Prain ex Maxim.	Orobanchaceae	
7	Pedicularis siphonantha D. Don	Orobanchaceae	
8	Pedicularis elwisii Hook f.	Orobanchaceae	
9	Pedicularis rhinanthoides Schrenk	Orobanchaceae	
10	Primula atrodentata W.W. Sm.	Primulaceae	
11	Primula capitata Hook.	Primulaceae	
12	Primula glomerata Pax	Primulaceae	
13	Primula involucrata Wall. ex Duby.	Primulaceae	
14	Primula minutissima Jacquem. ex Duby	Primulaceae	
15	Primula primulina (Spreng.) H. Hara	Primulaceae	
16	Primula sikkimensis Hook.	Primulaceae	
17	Primula walshii Craib.	Primulaceae	
18	Thalictrum alpinum L.	Ranunculaceae	
19	Thalictrum chelidonii DC.	Ranunculaceae	
20	Thalictrum cultratum Wall.	Ranunculaceae	
21	Thalictrum dalzellii Hook.	Ranunculaceae	
22	Thalictrum elegans Wall.	Ranunculaceae	
23	Thalictrum foliolosum DC.	Ranunculaceae	
24	Thalictrum javanicum Bl.	Ranunculaceae	
25	Thalictrum punduanum Wall.	Ranunculaceae	
26	Thalictrum rostellatum Hook. fil. & Thoms.	Ranunculaceae	
27	Thalictrum saniculiforme DC.	Ranunculaceae	
28	Thalictrum virgatum Hook. f. & Thomson	Ranunculaceae	
29	Saxifraga aristulata Hook.f. & Thoms.	Saxifragaceae	
30	Saxifraga brachypoda D. Don	Saxifragaceae	
31	Saxifraga brunonis Wall. ex Ser.	Saxifragaceae	
32	Saxifraga diversifolia Wall.	Saxifragaceae	
33	Saxifraga filicaulis Wall.	Saxifragaceae	
34	Saxifraga parnassifolia D. Don	Saxifragaceae	
35	Saxifraga stella-aurea Hook. fil. & Thoms.	Saxifragaceae	
36	Saxifraga strigosa Wall.	Saxifragaceae	
37	Carex atrata L.	Cyperaceae	
38	Carex filicina Nees.	Cyperaceae	
39	Carex gracilentia Boott ex Boeckeler	Cyperaceae	
40	Carex himalaica T.Koyama	Cyperaceae	
41	Carex kokanica (Regel) S.R.Zhang	Cyperaceae	
42	Carex nubigena D.Don	Cyperaceae	
43	Carex parvula O.Yano	Cyperaceae	

44	Carex unciniiformis Boeckeler	Cyperaceae	
45	Impatiens edgeworthii Hook. fil.	Balsaminaceae	H
46	Impatiens racemosa DC.	Balsaminaceae	H
47	Impatiens sp.	Balsaminaceae	H
48	Impatiens sulcata Wall.	Balsaminaceae	H
49	Impatiens urticifolia Wall.	Balsaminaceae	H
50	Begonia dioica Buch.-Ham. ex D. Don	Begoniaceae	H
51	Begonia palmata D. Don	Begoniaceae	H
52	Begonia picta Sm.	Begoniaceae	H
53	Berberis aristata DC.	Berberidaceae	S
54	Berberis concinna Hook. fil.	Berberidaceae	S
55	Berberis napaulensis (DC.) Spreng.	Berberidaceae	S
56	Swertia angustifolia Buch.-Ham. ex D. Don	Gentianaceae	H
57	Swertia chirayta (Roxb.) Karst.	Gentianaceae	H
58	Swertia paniculata Wall.	Gentianaceae	H
59	Rubus biflorus Buch.-Ham. ex Sm.	Rosaceae	S
60	Rubus ellipticus Sm.	Rosaceae	S
61	Rubus nepalensis (Hook. fil.) Kuntze	Rosaceae	H
62	Rubus rosifolius Sm.	Rosaceae	S

Table: List of the Counted Genera in Gyasumbdo and Annapurna Conservation Area

Table shows Thalictrum species dominant with 11 species in Gyasumbdo and Impatiens species dominant with 5 species in Annapurna Conservation Area.

Conclusion and Recommendation

The study provides basic floral data by means of a thorough botanical inventory. Asteraceae and Poaceae were found to be the largest families of dicots and monocots respectively. Describing the floristic composition of habitat is valuable for the continuation of ecological research, management, and conservation of plants. The presence of numerous species of Aconitum, Berberis, Delphinium, Impatiens, Potentilla, and Saxifraga represents the dominance of Eastern Himalayan floristic elements. Asteraceae and Orchidaceae were found to be the largest families of dicots and monocots respectively. There are many fresh places still to be explored as the collection was made only along transects and there is still a high possibility of recording a higher number of species from this valley [9-11].

References

1. Dirzo, R., & Raven, P. H. (2003). Global state of biodiversity and loss. *Annual review of Environment and Resources*, 28(1), 137-167.
2. Sharma, P., Rana, J. C., Devi, U., Randhawa, S. S., & Kumar, R. (2014). Floristic diversity and distribution pattern of plant communities along altitudinal gradient in Sangla Valley, Northwest Himalaya. *The Scientific World Journal*, 2014(1), 264878.
3. Chapin Iii, F. S., Zavaleta, E. S., Eviner, V. T., Naylor, R. L., Vitousek, P. M., Reynolds, H. L., ... & Díaz, S. (2000). Consequences of changing biodiversity. *Nature*, 405(6783), 234-242.
4. Shah, M., Hussain, F., Shah, S. N., Ahmad, I., & Wasila, H. (2013). Life form and floristic characteristics along altitudinal gradient of humid temperate forests located in remote area of Pakistan. *Global J. of Biodi. Sci. and Manag.* 3(2), 276-281.
5. Dobremez, J. F. (1977). *Le Népal: écologie et biogéographie*. FeniXX.
6. Simpson, M. G. (2019). *Plant systematics*. Academic press.
7. Takhtajan, A. (1986). *Floristic Regions of the World*; English translation. Berkeley, California, USA: the University of California Press.
8. Joshi, L. R., Ghimire, S. K., Salick, J., & Konchar, K. M. (2015). Distribution of vascular plants in a subalpine-nival gradient of Central Himalaya: current patterns and predictions for future warming climate. *Botanica Orientalis: Journal of Plant Science*, 9, 27-39.
9. Adhikari, K. (2007). *Contribution to the Flora of Lower Manang (Gyasumdo) and its Adjoining Areas, Central Nepal* (Doctoral dissertation, Department of Zoology).
10. Chaudhary, R. P., & Majupuria, T. C. (1998). Biodiversity in Nepal: status and conservation: a most recent, profusely illustrated pioneer book with up-to-date information and pertinent references. (No Title).
11. Shaheen, H., Ullah, Z., Khan, S. M., & Harper, D. M. (2012). Species composition and community structure of western Himalayan moist temperate forests in Kashmir. *Forest Ecology and Management*, 278, 138-145.