Haya: The Saudi Journal of Life Sciences (SJLS)
Scholars Middle East Publishers
Dubai, United Arab Emirates
Website: http://scholarsmepub.com/

ISSN 2415-623X (Print)
ISSN 2415-6221 (Online)

Herbaceous Fodder Plants along the National Highway from Parwanoo to Kaurik in Himachal Pradesh, India

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Original Research Article

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Article History
Received: 10.02.2018
Accepted: 20.02.2018
Published: 28.02.2018

DOI:
10.21276/haya.2018.3.2.16

Abstract: A survey of herbaceous fodder plants along the national highway from Parwanoo to Kaurik was carried out. Mostly along the national highway rural areas were situated and they used local flora for their cattle or livestock. Some of the herbaceous plant species used as fodder among the communities of these areas. In Present paper, 53 species belonging to 17 families and 44 genera were recorded and identified. The families with higher number of species were Poaceae with 29 species, Leguminosae with 5 species, Brassicaceae and Cyperaceae with 2 species, Acanthaceae, Begoniaceae, Caryophyllaceae, Commelinaceae, Compositae, Convolvulaceae, Cucurbitaceae, Datiscaceae, Oxalidaceae, Pedaliaceae, Polygonaceae, Solanaceae, Urticaceae with 1 species each. The genera represented by the higher number of species *Setaria* (3 species), *Chrysopogon, Cyperus, Oplismenus, Paspalum, Saccharum, Trifolium* (2 species) and rest of the genera comprising only one species.

Keywords: Fodder plants, Herbaceous, National Highway, Himachal Pradesh

INTRODUCTION

Herbaceous plants are plants that have no persistent woody stem above ground. It may be annual, biennials and perennials [13]. Annual herbaceous plants die completely at the end of the growing season and then grow again from seed [9]. Herbaceous biennial and perennial plants may have stems that die at the end of the growing season, but parts of the plant survive under or close to the ground from season to season.

Herbs have a variety of uses including medicinal, edible, fodder, religious, insecticide, aromatic, dye yielding, ornamental, cosmetic and poisonous. Fodder plants are agricultural foodstuff used specifically to feed domesticated livestock such as cattle, sheep, horses, chicken and pigs. Fodder includes hay, straw, silage, compressed and pelleted feeds, oils and mixed rations, grasses, millets, legumes. The production of grass for cattle fodder is a valuable intercrop between crops for human consumption, because it builds the organic matter in the soil. Fodder in the form of sprouted grains and legumes can be grown. National Highway from Parwanoo to Kaurik is NH-5 which starts form Punjab to Kinnaur district of Himachal Pradesh. The old name was NH-22 and this road is also known as the old Hindustan-Tibet Road[11]. The study was taken to congregate data related to herbaceous fodder plants along the national highway from Parwanoo to Kaurik.

MATERIAL AND METHODS

Study Area

Himachal Pradesh is one of the states that lie in the Indian Himalayan Region (IHR), one of the richest reservoirs of biological diversity in the world. Himachal Pradesh experience diverse climatic condition due to wide variation in altitude ranging from 350 m in the southern tract to over 6500 m in the main Himalaya and in the area lying in it [3]. Due to altitudinal variation, great variation in climate and biodiversity. National Highway from Parwanoo to Kaurik covers three districts of Himachal Pradesh named as Solan, Shimla and Kinnaur and their altitude vary from lower to higher. Solan is also known as the "Mushroom city of India" because of the vast mushroom farming in the area. It is blessed with diverse and rich source of biodiversity. Shimla is capital of Himachal Pradesh. Forests in Shimla are Pine, Deodar, Oak and Rhododendron[7]. Kinnaur is located in the northeast corner of Himachal Pradesh bordering Tibet to the east.

The slopes are covered with thick wood, orchards, fields and picturesque hamlets. It is famous for the Kinnaur Kailash, a mountain sacred to Hindus close to the Tibetan border.

METHODOLOGY

Exploration trips were carried out to collect, preserve and identify the plant species from 2012-2016. Standard procedures were adopted for collecting, preserving and identifying the herbaceous fodder plants. Data were compiled with related literature and then report was documented. Information was composed from different floras namely: Flora Simlensis by Collet [5], Flora of Bushar Himalayas by Nair [10], Flora of Himachal Pradesh by Chowdhury and Wadhwa [4], Flora of Kullu by Dhaliwal and Sharma [6], Flora of Sirmaur by Kaur and Sharma [8] and Flora of Chamba district by Singh and Sharma [12]. Information was also collected from: The useful plants of India by Ambasta [2], Directory of Indian economic plants by Agarwal [1].

RESULTS AND DISCUSSIONS

Presence of 53 species belonging to 17 families and 44 genera. The families with higher number of species were Poaceae with 29 species, Leguminosae with 5 species, Brassicaceae and Cyperaceae with 2 species, Acanthaceae, Begoniaceae, Caryophyllaceae, Commelinaceae, Compositae, Convolvulaceae, Cucurbitaceae, Datiscaceae, Oxalidaceae, Pedaliaceae, Polygonaceae, Solanaceae, Urticaceae with 1 species each. The genera represented by the higher number of species *Setaria* (3 species), *Chrysopogon, Cyperus, Oplismenus, Paspalum, Saccharum, Trifolium* (2 species) and rest of the genera comprising only one species. A list of the plant species along with their scientific name, family, common name and elevation is given in Table 1.

Table-1: List of Herbaceous fodder plants

Sr. No.	Plant Name	Family	Common name	Elevation
1.	*Alysicarpous rugosus* (Willd.) DC.	Leguminosae	RED MONEYWORT	1500 m
2.	*Arundo donax* L.	Poaceae	GREAT REED, SPANISH CANE	2400 m
3.	*Begonia picta* Smith	Begoniaceae	PAINTED LEAF BEGONIA	600-2800 m
4.	*Brassica rapa* L.	Brassicaceae	BIRD RAPE, FIELD-MUSTARD, INDIAN COLZA, RAPE SEED	1500 m
5.	*Bromus ramosus* Huds	Poaceae	HAIRY BROME	2000-3000 m
6.	*Chrysopogon aciculatus* (Retz.) Trin.	Poaceae	GOLDEN FALSE BEARD GRASS, LESSER SPEAR GRASS	1500 m
7.	*Chrysopogon gryllus* (L.) Trin.	Poaceae	SECENTED GRASS	1200-2500 m
8.	*Commelina benghalensis* L.	Commelinaceae	BENGHAL DAYFLOWER, TROPICAL SPIDERWORT	400-2000 m
9.	*Convolvulus arvensis* L.	Convolvulaceae	FIELD BINDWEED	3000 m
10.	*Cynodon dactylon* (L.) Pers.	Poaceae	DHUB, DOOB, BERMUDA GRASS, COUCH GRASS	400-2700 m
11.	*Cyperus niveus* Retz.	Cyperaceae	SNOW WHITE SEDGE	3000-2000 m
12.	*Cyperus pilosus* Vahl	Cyperaceae	FUZZY FLAT SEDGE	1500 m
13.	*Dactylotenium aegypticum* (L.) Willd.	Poaceae	BAECH WIRE GRASS, COAT BUTTON GRSS, CROWFOOT GRASS, DUCK GRASS	400-1500 m
14.	*Datisca cannabina* L.	Datiscaceae	FALSE HEMP	2000 m
15.	*Dicliptera bupleuroides* Nees	Acanthaceae	CHINESE FOLDWING, ROXBURGH'S FOLDING	400-2000 m
16.	*Digitaria stricta* Roth	Poaceae	-	400-2000 m
17.	*Echinocloa crusgali* (L.) P. Beauv.	Poaceae	BARNYARD MILLET, COCKSPUR PANIC GRASS, PANIC GRASS, WATER GRASS	400-1800 m
18.	*Eruca vesicaria* (L.) Cav.	Brassicaceae	ROCKET	1500 m
19.	*Fagopyrum actutatum* (Lehm.) Mansf. ex K. Hammer	Polygonaceae	BUCK WHEAT, COMMON BUCKWHEAT	1400-3000 m

20.	*Hordeum vulgare* L.	Poaceae	BARLEY	3900 m
21.	*Imperata cylindrical* (L.) Raeusch.	Poaceae	THATCH GRASS	600-2000 m
22.	*Lablab purpureus* (L.) Sweet	Leguminosae	DOLICHOS BEAN, EGYPTIAN BEAN, HYACINTH BEAN	700 m
23.	*Lolium perenne* L.	Poaceae	PERENNIAL RYE GRASS	2200 m
24.	*Microstegium nudum* (Trin.) A. Camus	Poaceae	-	3000 m
25.	*Momordica balsamina* L.	Cucurbitaceae	COMMON BALSAM APPLE.	500 m
26.	*Neyraudia arundinacea* (L.) Henr.	Poaceae	MEDAGASCAR GRASS	1500 m
27.	*Oplismenus compositus* (L.) P. Beauv.	Poaceae	RUNNING MOUNTAIN GRASS	3000 m
28.	*Oplismenus undulatifolius* (Ard.) P. Beauv.	Poaceae	WAVYLEAF BASKET GRASS	1500-2800 m
29.	*Oxalis acetosella* L.	Oxalidaceae	COMMON WOOD SORREL, WOOD SORREL	1200-3000 m
30.	*Paspalum dilatatum* Poir.	Poaceae	DALLIS GRASS, STICKY HEADS	2000 m
31.	*Paspalum distichum* L.	Poaceae	KNOT GRASS, WATER FINGER GRASS	1500 m
32.	*Pennisetum orientale* Rich.	Poaceae	ORIENTED FOUNTAIN GRASS, ORIENTAL PENNISETUM	700-2000 m
33.	*Phalaris minor* Retz.	Poaceae	SMALL CANARY GRASS	1500 m
34.	*Pisum sativum* L.	Leguminosae	GARDEN PEA, PEA, PEAS, PEASE, SNAP PEA	Plains to 4500 m
35.	*Poa annua* L.	Poaceae	ANNUAL MEADOW GRASS	2800 m
36.	*Polypogon fugax* Nees ex Steud.	Poaceae	ASIA MINOR BLUE GRASS	1500 m
37.	*Saccharum narenga* (Nees ex Steud.) Hack.	Poaceae	-	400-2000 m
38.	*Saccharum spontaenum* L.	Poaceae	KANS GRASS, WILD SUGARCANE	2000 m
39.	*Sesamum indicum* L.	Pedaliaceae	SESAME	600-2400 m
40.	*Setaria homonyma* (Steud.) Chiov.	Poaceae	-	2200 m
41.	*Setaria intermedia* Roem. & Schult.	Poaceae	KUTELA	1000-1500 m
42.	*Setaria viridis* (L.) P. Beauv.	Poaceae	GREEN FOXAIL, GREEN BRISTLE GRASS, WILD FOXTAIL MILLET	3400 m
43.	*Solanum americanum* Mill.	Solanaceae	AMERICAN NIGHTSHADE, GLOSSY NIGHTSHADE	2000 m
44.	*Stellaria media* (L.) Vill.	Caryophyllaceae	COMMON CHICKWEED, STAR CHICKWEED, STARWEED	400-4500 m
45.	*Taraxacum campylodes* G.E. Haglund	Compositae	BITTERWORT, BLOWBALL, BLOWER, CANKER, CANKERWORT	1100-5500 m
46.	*Trifolium campestre* Schreb.	Leguminosae	FIELD CLOVER, HOP TREFOIL	2200 m
47.	*Trifolium pratens* L.	Leguminosae	BROAD-LEAVED CLOVER, PURPLE CLOVER, RED CLOVER	2500 m
48.	*Tripogon filiformis* Nees ex Steud.	Poaceae	-	1200-4200 m
49.	*Trisetum spicatum* (L.) Richt.	Poaceae	SPIKE TRISETUM	2000-5500 m

50.	*Triticum vulgare* L.	Poaceae	BREAD WHEAT, COMMON WHEAT	4000 m
51.	*Urtica dioica* L.	Urticaceae	COMMON NETTLE, SCADDIE, STINGING NETTLE	1000-3000 m
52.	*Vicia villosa* Roth	Leguminosae	FODDER VETCH, HAIRY VETCH, WINTER VETCH	1800 m
53.	*Vigna umbellata* (Thunb.) Ohwi & H. Ohashi	Leguminosae	RICE BEAN, RED BEAN, CLIMBING MOUNTAIN BEAN	2100 m

A higher number of fodder plants belonged to Poaceae family with 29 spp. namely as (*Arundo donax, Bromus ramosus, Chrysopogon aciculatus, Chrysopogon gryllus, Cynodon dactylon, Dactylotenium aegypticum, Digitaria stricta, Echinocloa crusgali, Hordeum vulgare, Imperata cylindrica, Lolium perenne, Microstegium nudum, Neyraudia arundinacea, Oplismenus compositus, Oplismenus undulatifolius, Paspalum dilatatum, Paspalum distichum, Pennisetum orientale, Phalaris minor, Poa annua, Polypogon fugax, Saccharum narenga, Saccharum spontaenum, Setaria homonyma, Setaria intermedia, Setaria viridis, Tripogon filiformis, Trisetum spicatum, Triticum vulgare*) followed by Leguminosae with 5 spp. (*Alysicarpous rugosus, Lablab purpureus, Pisum sativum, Vicia villosa, Vigna umbellata*), Brassicaceae (*Brassica rapa* and *Eruca vesicaria), Cyperaceae* (*Cyperus niveus* and *Cyperus pilosus*) with 2 spp. and afterward rest of the families with one species. Families with higher number of species shown in Fig-1.

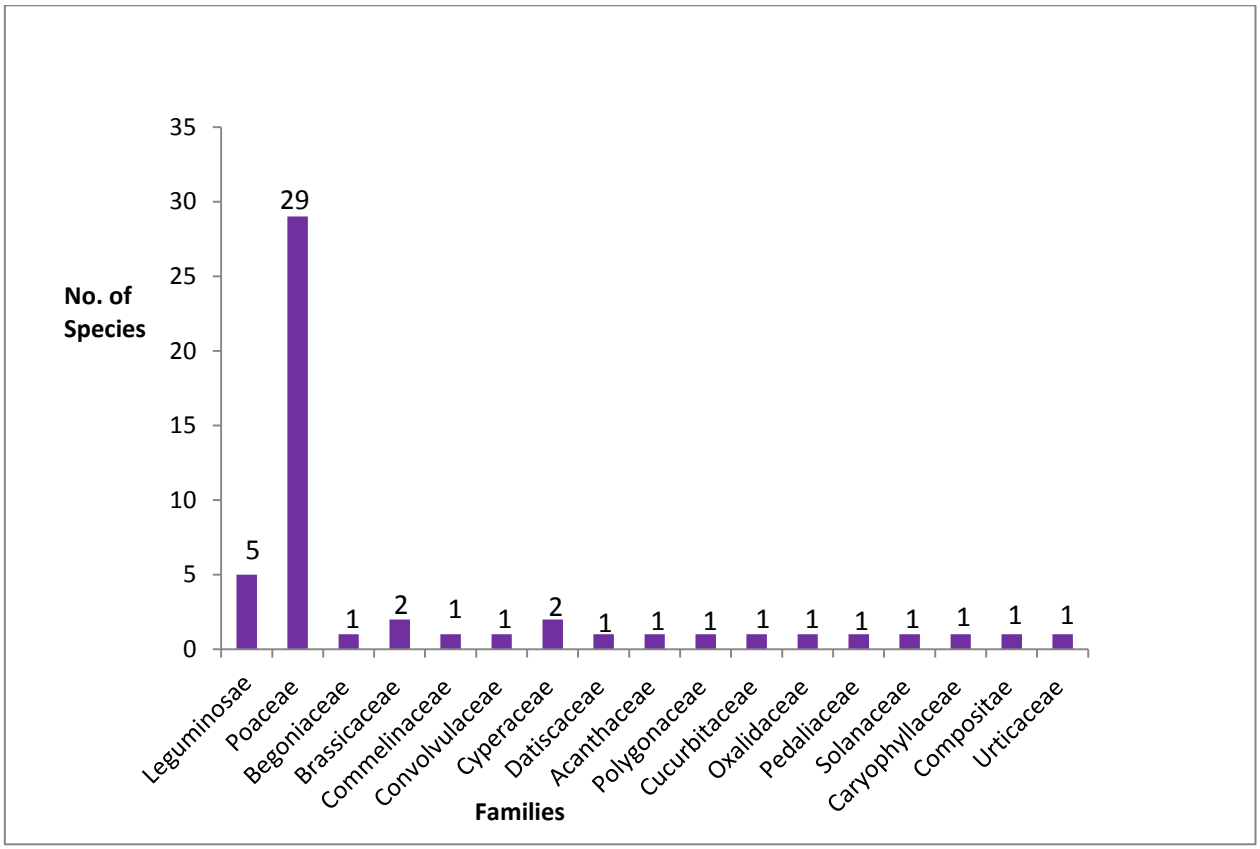

Fig-1: Families with higher number of species

CONCLUSION

Today, India ranks second worldwide in farm output. Utilization of herbaceous fodder plants plays a vital role in the livelihood of rural areas because this is income source also. They are depending upon the natural fodder plants in the fields, forests and in some cases fodder crops also sown. During the study about 53 herbaceous fodder plants widely used by local people to feed their cattle. Fooder plants are not only use in green state but after harvesting some plants they are also used as fodder *(Triticum vulgare)*. Due to widening of the national highway, climate change, pollution, constructions in forest areas, overgrazing, the productivity of the fodder plant has been declining too. So there is need of fodder crops that are cultivated for animal feed. Evaluation of natural herbaceous fodder

resources must be carried out and disseminate the ideas with proper technology and guidance to the peoples. Due to urbanization and modernization, everyone loses the traditional knowledge day by day. This is very essential to intensify our knowledge and come back to nature.

REFERENCE

1. Agarwal, V. S. (2003). *Directory of Indian economic plants*. Bishen Singh Mahendra Pal Singh (BSMPS).
2. Ambasta, S. P., & Ramchandran, K. (1986). The useful plants of India, publication and information directorate. *CSIR, New Delhi*, *109*.
3. Balokhra, J. M. (1999). *The Wonderland Himachal Pradesh: A Survey of Geography, People, History, Administrative History, Art & Architecture, Culture, Tourism and Economy of the State: a Book for Academicians, Research Scholars, Candidates Appearing in States Services Examinations and General Readers*. HG Publication.
4. Chowdhery, H. J., & Wadhwa, B. M. (1984). Flora of Himachal Pradesh: Analysis. *Flora of India series*, *2*.
5. Collett, H. (1902, 1921). Flora Simlensis, A handbook of flowering plants of Simla & the neighbourhood. 1st edition by Thacker, Spink and Co., London, 2nd edition by Thacker, Spink and Co., Calcutta and Simla, 652 pp. (Reprinted many times by Bishen Singh, Mahendra Pal Singh, Dehradun, India).
6. Dhaliwal, D. S., & Sharma, M. (1999). Flora of Kullu District (Himachal Pradesh). *Dehra Dun, India: Bishen Singh Mahendra Pal Singh 744p.-illus., col. illus.. ISBN 8121101492 En Icones, Keys. Geog*, *6*.
7. H.P. Forest Department. Retrieved 11 May 2007.
8. Kaur, H., & Sharma, M. (2004). *Flora of Sirmaur, Himachal Pradesh*. Bishen Singh Mahendra Pal Singh.
9. Levine, C. (1995). *A guide to wildflowers in winter: herbaceous plants of northeastern North America*. Yale University Press.
10. Nair, N. C. (1977). Flora of Bashahr Himalayas. *Hissar: Bioscience Publishers xxxii, 360p.-Illus.. Geog*, *6*.
11. "Rationalization of Numbering Systems of National Highway" Government of India, 28 April, 2010. Retrieved 21 August, 2011.
12. Singh, H., & Sharma, M. (2006). Flora of Chamba District. *Bishen Singh Mahendra Pal Singh, Dahradun, India*.
13. Solomon, E. P., Berg, L. R., Martin, D. W. (2004). Biology. Cengage Learning. 1248pp.