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Ethno-Veterinary and Fodder Plants of Awah-Devi Region of Hamirpur District, Himachal Pradesh

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ABSTRACT: The present study was conducted in Awah-Devi region of district Hamirpur (Himachal Pradesh) to accumulate traditional knowledge regarding diversity and availability of fodder and ethno-veterinarian plant resources for livestock. Survey questionnaire, participatory observations and field visits were conducted to illicit information. Information on locality, mode of use and seasonal availability was recorded by interviewing the people of studied villages. Fifty four species of fodder plants including trees, shrubs and herbs have been recorded during the present investigation. Out of these, eleven fodder plant species (*Acacia fistula, Brassica nigra, Brasssica compestris, Butea monosperma, Carissa opaca, Cissamplos pareira, Cynodon dactylon, Eclipta prostrata, Ficus palmate, Grewia optiva* and *Ziziphus mauritiana*) are also used traditionally for treatment of various livestock ailments.

Keywords: Fodder plants; Awah-Devi; Himalayas; seasonal availability and Lean period.

INTRODUCTION: This indigenous knowledge has evolved independently in a variety of ecosystems in different parts of the world.[1] However, due to changing perception of the user communities, commercialization and socio-economic transformation all over the world, there has been a general observation that the indigenous knowledge on sustainable use of resources has degraded severely, and needs to be documented before it is lost forever to posterity.[2] Livestock is considered as one of the main sources of livelihood, which depend mostly on fodder. Fodder is extracted from forests, grasslands, agricultural land and agro-forestry practices. Fodder collected from the forest forms the largest component of biomass energy, which plays a significant role in improving the nutritional requirement of livestock. Unavailability of green forage during summer and winter has always remained a serious issue resulting into nutritional deficiency in milch animals. During the rainy season, the availability of fodder is in plenty, but there is fodder crisis in other seasons of the year as people are not aware of scientific conservation of grasses for lean periods. The shortage of green fodder has been estimated to be 30-35% in lean period in rain fed districts Bilaspur, Hamirpur and Una of Himachal Pradesh.[3] Rain-fed agriculture is one of the serious constraints in district Hamirpur for sustainable agricultural production and climatic resilient agriculture.[4] It was observed that more fodder species are needed to be planted to increase the fodder availability in the area during lean period (April to June and November to February). A few studies have been conducted on fodder resources in the North West Himalayas.[5-14] About 279 species of fodder are known from the west Himalaya.[15] The livestock owners of North West Himalayas have devised traditional methods of treating various ailments of animals.[16-17] Whereas, there are studies on ethno-botany from other parts of Hamirpur district however there is no study on ethno-botany and ethno-veterinary of Awah-Devi region.[18] Therefore, efforts have been made to enlist plant species which are commonly used for cattle growing and ethno-vetenarian practices in the area.

MATERIALS AND METHODS: Awah-Devi is one of the hilly areas of Hamirpur district in Himachal Pradesh. The study was carried out in Chamobh, Bagwarra, Samirpur, Drobadi, Jaoh, Dhoh and Badhani villages of Awah-Devi region. The climate in the study area can be divided into three distinct seasons, cool and relatively dry winter (November to March), warm and dry summer (mid-April to June) and rainy (July to mid-September). The area is hilly covered by Shivalik range and the altitude varies from 450 meters -1,100 meters. Temperature ranges between 2^0C to 43°C. The hilly slopes are mostly cov-

ered with *Pinus roxburghii* forest.[19] Socio-economics of the study area is very diverse. It is inhabited by the people, who have their distinct way of life, language, tradition and cultural heritage. It offers a tremendous scope to study indigenous traditional knowledge.[20] Survey questionnaire, participatory observations and field visits were conducted throughout the year in 2017. The specimens were identified using regional floras and monographic works.[21-28]

RESULT AND DISCUSSION: A total of fifty four plant species of fodder plants belonging to 26 families has been identified (Table 1). Among the families, maximum species were represented by Poaceae (10 spp.) followed by Leguminosae (5 spp.), Chenopodiaceae (4 spp.), Bignoniaceae (3 spp.), Brassicaceae (3spp.), Mimosaeae (3 spp.) and Moraceae (3spp. each) (Figure 1). Whereas, Amaranthaceae, Menispermaceae and Ranunculaceae families contribute two plant species each.

Table 1: Seasonal availability of fodder plants.

Sr. No.	Season	Family	Taxa	L. Name	Life Form	Part used	Nature	Status	Other uses
1.	Rainy	Aceraceae	*Acer acuminatum* Wallich ex D.Don	Tilkunj	T	Leaves	F	R	M
2.	Rainy	Amaranthaceae	*Alternathera sessilis* L.	Jaljambua	H	Stem, Leaves	F, D	R	M
3.	Winter	Amaranthaceae	*Amaranthus viridis* L.	Chalaai	H	Leaves, Fruits	F	Co	M
4.	Winter	Anacardiaceae	*Pistacia integerrima* Stewart.	Kakar singhi	T	Leaves	F	R	Hb, M, Tr, Fl
5.	Rainy	Apocyanaceae	*Carissa opaca* Stapf ex Haines	Garna	S	Leaves	F	Co	M, E, Fl
6.	Rainy	Asteraceae	*Eclipta prostrata* L.	Bhring raj	H	Whole plant	F, D	R	M
7.	Rainy	Berberidaceae	*Berberis lycium* Hort.ex K. Koch	Rasaunt	H	Leaves	F	Oc	M
8.	Winter	Bignoniaceae	*Stereospermum chelonoides* L.	Padal	S	Leaves, Stems	F, D	R	Misc, M
9.	Winter	Bignoniaceae	*Oroxylum indicum* (L.) Benth. Ex Kurz	Tat-palanga	H	Leaves	F	R	M, Fl
10.	Sum-mer	Bignoniaceae	*Oroxylum indicum* Vent.	Arlu	H	Leaves	F, D	Co	M
11.	Winter	Boraginaceae	*Cordia dichotoma* G. Forst.	Lasura	T	Leaves, Buds	F, D	R	M, E, Fl
12.	Winter	Brassicaceae	*Brasssica compestris* L.	Saronh	H	Leanes, Seeds	F, D	Co	M, E
13.	Winter	Brassicaceae	*Brassica napus* L.	Toria	H	Leaves, Seeds	F, D	Co	M, E
14.	Winter	Brassicaceae	*Brassica nigra* (L.) Andrz.	Banarsi rai	H	Leaves, seeds	F, D	Oc	M, E
15.	Winter	Caesalpinaceae	*Bauhinia variegata* Linn	Karal	T	Leaves	F	Co	M, Hb, Tr, E
16.	Winter	Chenopodiaceae	*Chenopodium album* L.	Ghanaun	H	Green stem, leaves	F	Co	M

17.	Winter	Chenopodiaceae	*Chenopodium ambrosioides* Hance	Kah jawyan	H	Leaves	F, D	Co	M
18.	Winter	Chenopodiaceae	*Chenopodium album* L.	Bathu	H	Leaves, Stem	F	Co	M, E
19.	Winter	Chenopodiaceae	*Chenopodium botrys* L.	Kah sag	H	Leaves, Stem	F	Co	M
20.	Rainy	Commelinaceae	*Commelina benghalensis* L.	Rannipata	H	Leaves, Stem	F	Oc	M
21.	Rainy	Cyperaceae	*Cyperus rotundus* Hook. F.	moth	H	Whole plant	F	Oc	M
22.	Winter	Leguminosae	*Pisum sativum* L.	Mattar	S	Green stem, leaves	F	Oc	M, E
23.	Winter	Leguminosae	*Butea monosperma* Taub.	Dhak/Palah	T	Leaves	F	Oc	M, Misc, Fl
24.	Winter	Leguminosae	*Cajanus cajan* (L.) Huth	Arhar	S	Green stem, leaves	F	Oc	M, E
25.	Winter	Leguminosae	*Cicer arietinum* L.	Chhole	H	Green stem, leaves	F	Oc	M, E, R
26.	Winter	Leguminosae	*Macrotyloma uniflorum* (Lam.) Verdc.	Kolth	S	Green stem, leaves	F	Oc	M, E
27.	Rainy	Menispermaceae	*Cissamplos pareira* L.	Patindoo	H	Leaves, Fruits	F	Co	M, E
28.	Rainy	Menispermaceae	*Cocculus hirsutus* (L.) Diels	Tardya/Jal-Jamni	S	Green stem, leaves	F	R	M
29.	Winter	Mimosaeae	*Acacia catechu* (L. f.) Willd.	Khair	T	Leaves	F	Co	M, R, E
30.	winter	Mimosaeae	*Acacia fistula* Herbb. Ex Oliv.	Amaltash	T	Leaves	F	Oc	M, R, Fl
31.	Winter	Mimosaeae	*Acacia nilotica* H. Karst.	Kikar	T	Leaves	F	R	M, Hb, Fl
32.	Winter	Mimosaeae	*Albizia lebbeck* (L.) Benth.	Sarinh	T	Leaves	F	R	M, Hb, Fl
33.	Rainy	Moraceae	*Ficus palmata* Forssk.	Khasara	T	Leaves, Unripe Fruits	F	Co	Hb, M, E, R, Fl
34.	Rainy	Moraceae	*Ficus racemosa* Willd.	Tarayambl u	T	Leaves, Unripe Fruits	F	Co	M, E
35.	Rainy	Moraceae	*Morus alba* Bureau	Toot	T	Leaves, Unripe Fruits	F	Co	Hb, M, Tr, E, Fl
36.	Sum-mer	Myrtaceae	*Syzygium cumini* (L.) Skeels	Jamun	T	Leaves, Unripe Fruits	F	Co	Hb, Misc, M, E
37.	Winter	Papilionaceae	*Dalbergia sissoo* Graham ex Wight & Arn.	Tahli	T	Leaves	F	Oc	M, Fl

38.	Winter	Poaceae	*Dendrocalamus strictus* Nees	Bainz	S	Leaves	F	Co	Hb, Misc, M
39.	Winter	Poaceae	*Bambusa arundinacea* Bonpl.	Magar	S	Leaves	F	R	M, Hb, Misc
40.	Winter	Poaceae	*Bothriochloa pertusa* (L.) A. Camus	Khatiambi	S	Leaves	F	R	M, Misc
41.	Winter	Poaceae	*Brachiaria ramosa* (L.) Stapf	Butrri	S	Leaves	F	R	M
42.	Summer	Poaceae	*Cynodon dactylon* (L.) Pers.	Dhrub	H	Whole plant	F, D	Co	M, R
43.	Winter	Poaceae	*Neyraudia arundinacea* (L.) Henrad	Sarkanda	H	Rhizome, Leaves	F, D	Co	M, E
44.	Rainy	Poaceae	*Chrysopogon fulvus* L.	Puthpatr	H	Leaves, Stem	D	Oc	M
45.	Rainy	Poaceae	*Chrysopogon gryllus* L.	Gajannkah	H	Leaves, Stem	F	Oc	M
46.	Winter	Poeaceae	*Hordeum vulgare* L.	Jau	H		F, D	Oc	M, E
47.	Winter	Pooaceae	*Arundinaria falcata* Nees	Bainzhi	S	Leaves	F	Co	M, Hb
48.	Rainy	Primulaceae	*Anagallis arvensis* L.	Jonkmri	H	Stem, Leaves	F, D	R	M
49.	Rainy	Ranunculaceae	*Anemone vitifolia* Buch-Ham. Ex DC.	Makorri	H	Leaves, Stem	F	Co	M
50.	Rainy	Ranunculaceae	*Adonis aestivalis* M. Bieb.	Ban-saunf	H	Leaves, stem	F	Oc	M
51.	Rainy	Rhamnaceae	*Ziziphus mauritiana* Adans.	Ber / Malah	S	Leaves	F	Co	M, E, Fl
52.	Rainy	Rosaceae	*Prunus cerasoides* D.Don.	Pajja	S	Leaves	F	Oc	M
53.	Winter	Tiliaceae	*Grewia optiva* J. R. Drumm. Ex Burret	Buel	T	Leaves	F	Co	Hb, Misc, M, Fl
54.	Winter	Ulmaceae	*Celtis australis* L.	Khirk	T	Leaves	F	Co	M, Hb, Fl

Abbreviations used: *T=Tree, H=Herb, S=Shrub, F=Fresh, D=Dry, Hb=House based articles, Tr=Timber, E=Edible, R=Religious, Misc=Miscellaneous, M=Medicinal, Fl=Fuel, R=Rare, Oc=Occasional, Co=Common*

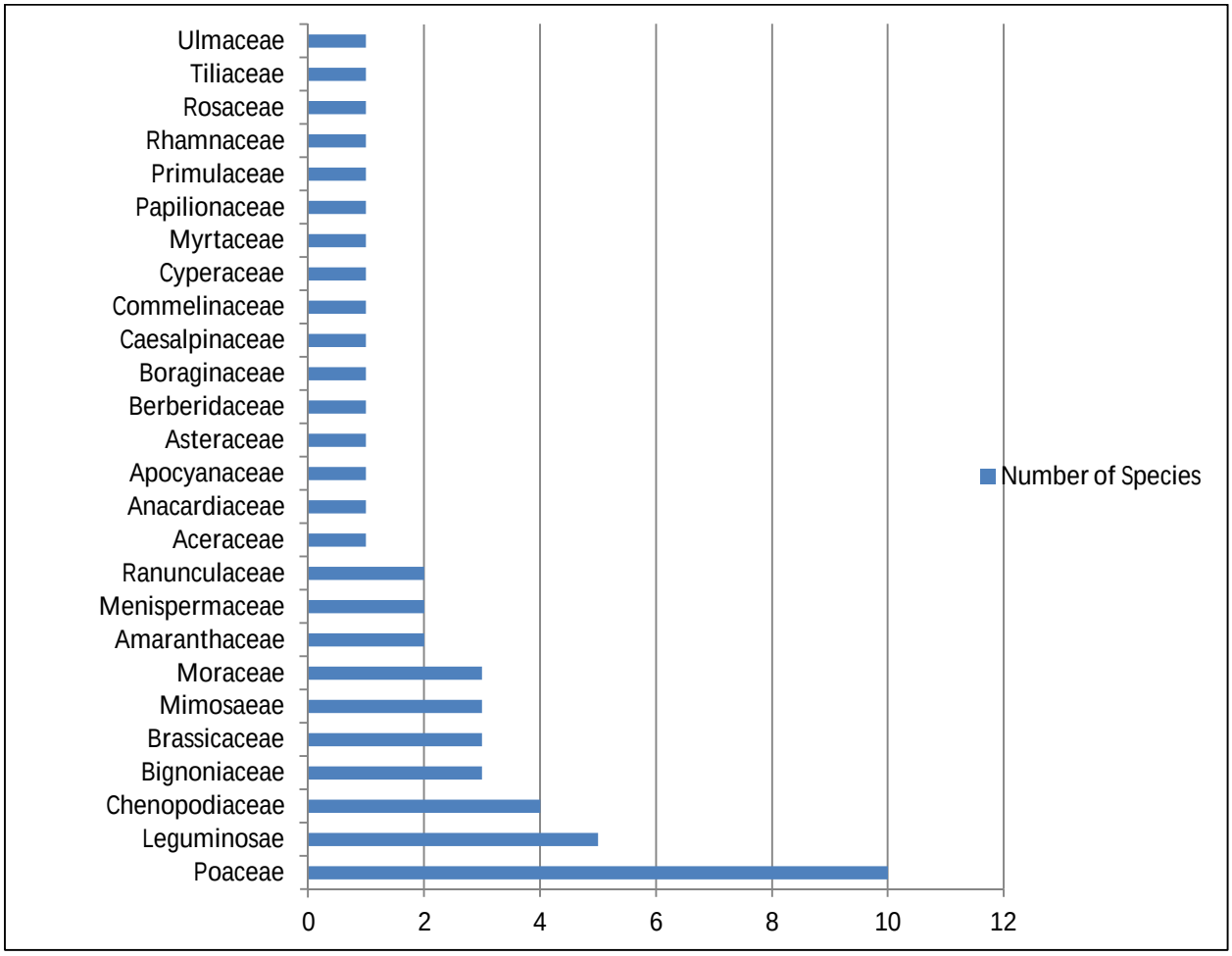

Figure 1: Number of fodder species contributed by different families.

CONCLUSION: Seasonal availability of fodder species varied from season to season. This variation in utilization pattern is due to the availability of species in respective seasons. Rainy season helps to produce plenty of green grasses and other herbaceous plants which are used as fodder. Out of 54 species, 3 species were used in summer, 32 in winter and 19 in rainy season. *Acacia fistula, Arundinaria falcate, Grewia optiva, Bauhinia variegata, Butea monosperma, Albizia lebbeck* and *Morus alba* are the major fodders, which are lopped during winter season. Dry fodders (crop residues and hay) are often fed to livestock in the winter season. Shrubs are chiefly browsed by goats and sheep, and leaves of *Acacia catechu* and *Zizyphus mauritiana* are fed to goats and sheeps. Among the recorded species, 41 species are used as fresh and 13 species are used both as fresh and dry. Eleven plant species are used for ethno-veterinarian practices by livestock owners of the study area (Table 2).

Table 2: List of fodder species used in Ethno-vetenarian practices.

S. No.	Taxa	Local Name	Material used	Ailment	Method of use
1.	*Acacia fistula* Herbb. Ex Oliv.	Amaltash	Beeds of Amaltash	Constipation	20-25 seeds of Amaltash are boiled in water and then lukewarm solution is given to the ailing animal.
2.	*Brassica nigra* (L.) Andrz.	Banarsi-rai	seeds	Abdominal pain	A decoction of *Foenicfulum vilagara* and crushed seeds of *Brassica nigra* are boiled together

					and fed to the ailing animal.
3.	*Brasssica compestris* L.	Sarson	Seed oil	Constipation	For curing constipation in large animal, 1/3-1/2 L mustard oil is given whereas it is reduced to 25-75 ml in young ones. Mustard oil is also given in case of *Lantana* poising.
4.	*Butea monosperma* Taub.	Dhak/Palah	Seed of Palah	Worm-infection and indigestion	Seeds of Palah with cumin seeds are used for treating worm infection and indigestion in cows and buffaloes.
5.	*Carissa opaca* Stapf ex Haines	Garna	Fruits	Constipation	For curing constipation in goats, fruits are crushed with desi ghee.
6.	*Cissamplos pareira* L	Patindoo	Fruits	Foot and Mouth Diseases (FMD)	Fruits are crushed, mixed concentrate and fed to the ailing animal.
7.	*Cynodon dactylon* (L.) Pers.	Dhrub	Herb	Worm infection, Pica and Constipation	The herb along with seeds of *Mallotus philippinensis* mixed with fermented milk. This causes cleaning of stomach and animal is cured.
8.	*Eclipta prostrata* L.	Bhring raj	Herb	Dysentary and Diarrhoea	Herb is ground well by adding water; solution is filtered through cloth and given orally to the diseased animal.
9.	*Ficus palmata* Forssk.	Khasra	Fig stick	Tongue swelling	Fig stick is heated and placed on affected portion of tongue.
10.	*Grewia optiva* J. R. Drumm. Ex Burret	Buel	Crushed bark of Buel	Worm-infection	Bark of Buel is crushed and given to the animals suffering from worm-infection.
11.	*Ziziphus mauritiana* Adans.	Ber/Braddi	Sarson oil	Foot and Mouth Diseases (FMD)	Roots of *Zizyphus mauritiana*, bark of *Flacourtia indica*, Curcuma longa and *Brassica campestris* are boiled in water. The affected hoofs are washed with this solution. Mouth infection is cured with the application of sarson oil.

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