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Nutritional and Therapeutic Potential of Underutilised Wild Vegetables of the North Western Himalayas

M.Mudasir Magray[*1] • Javid Iqbal Mir[2] • Sheikh Sultan[3] • Hilal Ah Malik[1] • Syed Mudassir Jeelani[2] • Ashiq Hussain[2] • Sajad Ahmad Zargar[4]

[1]*Mountain Agriculture Research and Extension Station,Izmarg SKUAST-K*
[2]*ICAR-Central Institute of Temperate Horticulture Srinaga*
[3]*ICAR-National Bureau of Plant Genetic Resource Institute, Srinagar*
[4]*Division of Plant Biotechnology,SKUAST-Kashmir*

*Corresponding Author Email Id: magraymudasir424 @gmail.com

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Abstract: Wild vegetables of North Western Himalayas have tremendous scope in terms of their nutritive as well as medicinal potential. These crops are climate resilient in nature and can grow in abiotic stress of environmental disturbances if any where traditional crops are unable to grow. These vegetables also have low input requirements unlike normal crops. These crops are rich in secondary metabolites which have huge antioxidant capacities and have anti-diabiatic, anti-cholesterol functions. These wild vegetables are being unexplored and have became underutilised currently owing to our meagre attention and interests. These vegetables have multiple functions both food as well as medicinal values which needs to be recognised as source of natural antioxidants which can be exploited for their use in pharmaceutical industries. These vegetables which possess vast nutrient potential needs to be reintroduced in our nutrition besides helping in combating various diseases like heart disease, digestive problems and tumours, etc.

Key words: Underutilised Vegetable Crops • Secondary metabolites • Nutriceutical • Unexplored Vegetables

Introduction

Several wild and traditional vegetables such as *Taraxacum* spp. (dandelion), orach (*Chenopodium* spp.), *Malva* spp., *Plantago* spp., and *Portulaca oleracea* have been neglected in modern agricultural and dietary systems, largely due to limited awareness regarding their high nutritional and medicinal value. These crops are commonly classified as underutilised or unexplored vegetables. Predominantly found in the North Western Himalayan regions of India—including Jammu & Kashmir, Leh & Ladakh, and Himachal Pradesh—these plants have historically been integral to the subsistence of tribal and rural communities, who used them for food, fodder, medicine, and even timber.

Over time, with the intensification of agriculture and urbanisation, these vegetables have largely been abandoned from mainstream cultivation, surviving mainly in remote, high-altitude areas such as Gurez, Tulail, Machil, Lolab, Shopian, and parts of Leh and Ladakh. These regions, often cut off during harsh winters, still rely on these crops for sustenance. However, their wild populations are diminishing due to a general lack of interest in their cultivation and research. Despite being nutritionally dense and rich in secondary metabolites—such as vitamins (A, B, K) and essential minerals (Ca, Fe, Zn, Cu)—these vegetables are often perceived as inferior and remain excluded from commercial farming and regular diets.

Underutilised vegetable crops are particularly important in the context of global food and nutritional security, especially considering that the world's population is projected to reach

approximately nine billion by 2050 (Godfray et al., 2010). The World Health Organization (WHO, 2011) recommends a daily intake of over 400 grams of vegetables per adult to help prevent chronic diseases, further underscoring the importance of diversifying vegetable consumption to include these nutrient-rich species.

These crops offer significant advantages in the face of climate change and land degradation. They are hardy, resilient to climatic extremes, and can thrive on marginal and wastelands with minimal agricultural inputs. Compared to widely cultivated vegetables like tomato, potato, and onion, these crops demand less agronomic management and are often grown organically, free from harmful chemical residues. Thus, promoting their cultivation can contribute to both ecological sustainability and livelihood enhancement in remote regions.

Economically, many people in these inaccessible areas depend heavily on agriculture, but limited cropping seasons and scarce resources restrict the range of cultivable crops. Under such conditions, low-input, high-nutrient crops like these underutilised vegetables provide a viable option for improving food and nutrition security, provided they are brought under formal cultivation.

Phytochemical studies have revealed that these vegetables contain bioactive compounds with anti-diabetic, anti-carcinogenic, anti-inflammatory, antibacterial, anti-diarrhoeal, and protective properties. Despite their potential, laboratory research on their pharmacological mechanisms remains limited. Given their dual nutritional and therapeutic value, these vegetables are increasingly being recognised as "superfoods."

Methodology

The study was based on a comprehensive review of ethnobotanical literature, field visits, and interactions with local inhabitants and traditional knowledge holders in various districts of the North Western Himalayas, including Kashmir Valley, Leh & Ladakh, and parts of Himachal Pradesh. Data collection involved participatory rural appraisal (PRA) techniques to document local knowledge on the use, availability, and importance of underutilised wild vegetables. Medicinal and nutritional information was compiled through published scientific studies, peer-reviewed journals, and ethnopharmacological surveys. Plant specimens were identified using standard taxonomic methods and verified with the help of experts from SKUAST-K and ICAR institutions. Information was tabulated to highlight botanical identity, vernacular names, parts used, and traditional medicinal uses.

Results and Discussion

List of underutilised/wild vegetable crops of North Western Himalayas is presented in Table 1. Notable examples from the Kashmir Valley include *Taraxacum officinale* (used as a tonic, diuretic, blood purifier in jaundice; Khan et al., 2004), *Chenopodium foliosum* (used as a laxative and for urinary issues; Hamayun et al., 2012), and *Malva sylvestris* (used for cough and fever; Khan et al., 2004). Others like *Plantago lanceolata*, *Oxyria digyna*, *Rheum emodi*, *Dipsacus mitis*, *Rumex nepalensis*, *Amaranthus caudatus*, *Portulaca oleracea*, and *Nelumbium nucifera* are used traditionally for treating a wide range of ailments including wounds, gastrointestinal disorders, fevers, and inflammation (Khan et al., 2004; Subzar, 2014; Anjum and Anupam, 2020).

In conclusion, these underutilised vegetables hold tremendous promise as both nutritional staples and sources of pharmacologically active compounds, meriting focused research, conservation, and promotion for wider adoption in mainstream agriculture and diets.

A total of 30 underutilised/wild vegetable species were documented from the North Western Himalayan region. Their botanical identity, vernacular names, families, parts used, and reported medicinal values are summarised in Table 1.

Table 1 :-List of underutilised/wild vegetable crops of North Western Himalayas

SN	Scientific Name	Vernacular Name	Family	Part Used	Medicinal Uses
1.	*Amaranths Caudatus* L.	Lissa	Amranthacea	Leaves	Hepatoprotective, antioxidant activity, antidiuretic, antiviral, antimalarial, antibacterial, anti-inflammatory, antimicrobial, and hepatic disorders (Olusanya 2021)
2.	*Dipsacus mitis D.*Don	Wopal Haakh	Dipsacaceae	Leaves	Antibacterial, antifungal or antioxidant properties,anti-tumor activity,Anti Bacterial and Anti Fungal (Gyawali *et al*., 2012)
3.	*Malva Parviflora* L.	Soutchal	Malvacea	Leaves	Antidiabetic activity, Wound healing activity, Anti-inflammatory activity and Neuroprotective activity (Ajeet Singh and Navneet 2017).
4.	*Malva Sylvestris L*	Baghi-Soutcal	Malvacea	Leaves, Roots, Aerial Parts	Antioxidant Activity, Antimicrobial Activity,Anticancer Activity,Wound Healing Activity and Anti-inflammatory Activity (Seyyed *et al* 2021)
5.	*Nymphea Alba* L	Khor	Nymphacea	Aerial part	Anti - Inflammatory activity, Anti-diarrheal activity, Antibacterial activity, Anticarcinogenic effect,: (Agnihotri *et al.,* 2020)
6.	*Plantago major*	Wethe Gulle	Plantagincea	Leave s	Immune Enhancing Effects, Hepatoprotective Effects, Gastrointestinal and Pulmonary effects, urinary effect Younees *et al.,* 2018)
7.	*Portulaca Oleracea*	Nunar	Portulaca	Stem and Leaves	Neuroprotective, antimicrobial, antidiabetic, antioxidant, anti-inflammatory, antiulcerogenic, and anticancer activities,(Yan-Xi Zhou *et al* ., 2015)
8.	*Nymphea Stellata* L.	Buem	Nymphaea	Leaves	Leaves, roots and flowers are used for diabetes, blood disorders, antifertility, heart troubles, dysentery, and as a cardiotonic, and cardiac stimulant.
9.	*Rumex Nepalensis* L	Abuj	Polygonacea	Leaves ,Roots and other Aerial parts	Antimicrobial activity, Wound healing activity, Anti -plasmodial activity, anti-ulcer activity and , tumor, mild diabetes, (Gonfa *et al* 2021).
10.	*Taraxacum Officinale* Weber	Handh	Astraea	Leaves	Its anti-antigenic, anti-inflamatory, antibacterial, anti-nociceptive activities (Ivanov 2014)
11.	*Rheum emodii*	Pamba Haakh	Polygonacea	Leaves	Antifungal, antioxidant, anticancer, antimicrobial, healing, and immune-enhancing action, antioxidant, antidiabetic, antimicrobial, cytotoxic, hepatoprotective and nephro-protective activities (Zargar *et*

					al.,2011).
12.	*Cichorium Intybus*	Kasni Hyndh	Asteraceae	Leaves, Root	Anticarcinogenic, anti-inflammatory, antiviral, antibacterial, antimutagenic antifungal, anthelmintic, immune-stimulating, and its antioxidant properties .
13.	*Centuia Iberica*	Kretsch	Asteraceae	Leaves	Antibacterial activity,Antifungal activity, Anticancer activity, QuickWound,Healing,Digestive,Dermatological problems (Bibi *et al.,* 2024).
14.	*Chenopodium Folium Asch*	Wan palak	Chenopodiaceae	Aerial Parts	Antimicrobial activity radical-scavenging activity (Khan *et al* 2011)
15.	*Artiplex Hortensis* L	Wasta Haakh	Chenopodiacea	Leaves	Used to cures respiratory tract, digestive and urinary diseases, and Jaundices.It act as diuretic, emetic an purgative.
16.	*Nelumbo Nucifera*	Nodur	Nelumbonaceae	Stem/Rhizome	Hypoglycaemic,psychopharmacological effect, demulcent, beneficial in dysentery and chronic dyspepsia (Subzar 2014)
17.	*Phytolaca acetinosa*	Lober Haakh	Phytolacca	Leaves	Antioxidant activity (Niwano *et al* .,2011)
18.	*Plantago lanceolata*	Gulle	Plantagincea	Leaves	Antioxidant and anti carcinogenic anti-inflammatory and cytotoxic
19.	*Rumex Acetosa*	Tchoksen	Polygonacea	Leaves	Antimutagenic and cytotoxic (Anjum and Anupam 2020)
20.	*Capsella pastoris* L	Kralmond	Brassicaceae	Leaves, Whole plant parts	Wound-healing anti-bleeding, antioxidant, antibacterial, and anticancer effects (Iqra *et al*., 2021).
21.	*Stellaria media* L	Nick Haakh	Caryopyllacea	Leaves	Anti-inflammatory activities Anti-oxidant activity, Antileishmanial activity Antidiabetic activity
22.	*Nasturtium Officinale*	Nagbabur	Brassicaceae	Leaves	Hypolipidemic, anti-inflammatory, hepato and reno protective, antidiabetic,antioxidant, anticancer,antimicrobialdermatological, (Al-Snafi 2020)
23.	*Dryopteris ramosa* L.	Lungeri	Dryopteridaceae	Stem and Leaves	Plant is also used as tonic for various stomach and intestinal problems against gastric ulcer, constipation and as aphrodisiac SM, (Razi *et al* 2011).
24.	*Silene Vulgaris* L.	Vatacrum	Caryophyllaceae	Aerial Parts	Antibacterial,antioxidant, anti-aging, anti-inflammation, anti-cancer, and Reducing Blood Pressure (Thakur 2021)
25.	*Eremerus Himaliacus* L.	Fox tail Lily	Asphodelacea	Aerial Plants	Anti-asthmatic, uterine stimulant, anti-feedant, radioprotector, insect repellent, antibiotic, aphrodisiac and anti-obesity (Zargar *et al*., 2011)
26.	*Allium Schaenoprasum*	Wild spp	Alliacea	Leaves	Antioxidant and anti-carcinogenic,antifungal and

					antimicrobial activities antibacterial, antiviral, antifungal, anti-diabetic potentials
27.	*Allium Victoralis*	Wild spp	Alliaceae	Leaves	Antiviral, antibacterial, antifungal, antidiabetic, anti-carcinogenic, anti platelet,antiseptic, anti-helminthic, anti thrombotic (Najeebullah *et al,*2021)
28.	(*Chenopodium album* L.)	Bathua	Chenopodiaceae	Leaves	Used against hepatic disorders, spleen enlargement, also has antimutagenic and anticancer activities (Bhatia *et al*.,2020)

Conclusion

Undoubtly North western Himalayan region has a rich diversity of underutilised or wild vegetables which posses huge nutritional, pharmacological and traditional values.These vegetables can be grown with organic or low input methods and are thus purely natural or organic without having chemical residues which makes them safe for nutrition.These vegetable are climate resilient also.These vegetable posses a huge quantity of secondary metabolites like Phenols.Tannines,Saponins rutins ,quercetins ,cholrogenic acid,caffiec acid, These are best source of antioxidants which prevent cancers.The seed production of such vegetables under farmers field is a big challenge so as bring them under domestication.

Now humans have realised that the life was best among our ancestors which have food habits mostly dependent on Niche or underutilised vegetable crops.These crops should be preferred as compared to traditional vegetables. Slogan of the current world scenario is back to nature so that our health will saved from artificial chemicals used during cultivation of traditional vegetable crops. Lack of proper knowledge regarding the nutritive and medicinal value of wild vegetables has been an important deterrent to their general acceptance and utilization and regards them as inferior to use. Research on potentially exploitable wild vegetable plant species has to be conducted as this would promote their domestication and utilization.The information would help in addressing various nutritional and healthcare deficiency of Indian communities as this part of India is highly vulnerable to life style and degenerative diseases. This information should be useful for both product development and awareness raising.These wild vegetables could be recommended as a source of bioactive compounds with potential therapeutic compounds and health benefits. The fact that traditional rural communities were and still are nutritionally successful, even during periods of drought, affirms the importance of recognizing and utilizing traditional wild food resources. Compared to conventional cultivated species, wild vegetables are hardy, require less care, and are a rich source of important micronutrients, vitamins and minerals needed to maintain health and promote immunity against infections besides providing food security.

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References

Agnihotri S, Singh G, Narwal S And Balram (2020). Nymphaea alba: a detailed study.*International Journal of Biology,Pharmacy and Allied Sciences* **9**(9): 2366-2381.

Ahmed S, Khan M. H, Masood and Siddique A H (2008). Antihepatotoxic activity of cichotyboside, a sesquiterpene glycoside from the seeds of Cichorium intybus.,"

Journal of Asian Natural Products Research, vol. **10**, no. 3-4, pp. 223–231.

Ahmed T. A, Al-Howiriny, and Siddiqui A B (2003). Antihepatotoxic activity of seeds of Cichorium intybus," *Journal of Ethnopharmacology*, vol. **87**, no. 2-3, pp. 237–240,.

Al-Snafi,Ali Esmail (2020).A review on Nasturtium officinale:A potential medicinal plant IOSR *Journal of Pharmacy* (e)-ISSN: 2250-3013, (p)-ISSN: 2319-4219 **10** (9) PP. 33-43.

Anjum Talat and Mangal K Anupam (2020). Therapeutic value of wild vegetables of Kashmir valley – Review *International Journal of Pharmacognosy and Life Science* **1**(1): 10-15.

Barros L, Carvalho AM, Ferreira I (2010). Leaves, flowers, immature fruits and leafy flowered stems of Malva sylvestris: A comparative study of the nutraceutical potential and composition. *Food Chem. Toxicol*., **48**(6):1466-1472.

Beara L.I, Lesjak M.M, Orcica DZ, Simin ND, Cetojevic-Simin DD, Bozin BN (2012). Comparative analysis of phenolic profile, antioxidant, anti inflammatory and cytotoxic activity of two closely related Plantain species: *Plantago altissima* L. and *Plantago lanceolata*. *Food Sci. Tech.* 47:64-70.

Bhatia Manila, Singh Surendra, Pagare Saurabh, Kumar Bhumesh A (2020). Pharmacological comprehensive review on *Chenopodium album* L. *International Journal of Current Research* Vol. **12**, (12) pp.15360-15368.

Charles H,Godfray J, Ian R, Crute L. H,David Lawrence, James F. M,Nicholas Nisbett, Pretty Jules, Sherman R, Camilla T and Whiteley. R (2010).The future of the global food system *Phil. Trans. R. Soc*. B 365, 2769–2777.

Dalar A, Türker M, Konczak I (2012).Antioxidant capacity and phenolic constituents of *Malva neglecta* Wall and *Plantago lanceolata* L. from Eastern Anatolia Region of Turkey. *J Herb. Med.*; **2**(2):42-51.

Gálvez M, Mart C, Cordero M, López-Lázaro, Cortés F, Marı Jesús Ayuso (2003). Cytotoxic effect of Plantago spp. on cancer cell lines. *J Ethnopharm.*; **88**(2, 3):125 130.

Godfray, H. C. J (2010). Food security: the challenge of feeding 9 billion people. Science 327, 812 – 818. (doi:10.1126/science.1185383).

Gonfa Hunde Yilma, Beshah Fekade, Getachew Tadesse Mesfin, Archana Bachheti and Kumar Rakesh Bachheti (2021).Phytochemical investigation and potential pharmacologically active compounds of Rumex nepalensis: an appraisal.*Beni-Suef University Journal of Basic and Applied Science*s 10:18.

Hamayun S, Khan S, Qureshi R, Zahidullah (2012). Indigenous plant resources and their utilization practices in village populations of Kashmir Himalayas *Pak. J Bot*; **44**(2):739-745.

Ivanov I. G (2014). Polyphenols Content and Antioxidant Activities of Taraxacum officinale F.H. Wigg (Dandelion) Leaves.*International Journal of Pharmacognosy and Phytochemical Research* ; 6(4); 889-89.

Kaul MK (1997). Medicinal Plants of Kashmir and Ladakh.Indus Publishing Company, New Delhi,.

Khan FA, Khattak MR, Shah S.M.M,Zahoor M, Shah SM. (2011).Screening of Crude Phytochemicals and Antimicrobial Activities of Selected Medicinal Plants of Peshawar Region Khyber Pakhtoon Khawa Pakistan Middle-East. *J Scientific Res.*; **9**(2):3712-3716.

Khan ZS, Khuroo A, Dar GH (2004). Ethnomedicinal survey of Uri, Kashmir Himalayas. IJTK; **3**(4):351-357.

Kim M 2000.The water-soluble extract of chicory reduces cholesterol uptake in gut-perfused rats," Nutrition Research, vol. **20**, no. 7, pp. 1017–1026,.

Lee N, Choi J, Koo B, Ryu S, Han Y, Lee S (2005) Antimutagenicity and Cytotoxicity of the Constituents from the Aerial Parts of Rumex acetosa.*Bio. Pharm. Bulletin.*; **28**(11):2158-2161.

Malik A, Khuroo A, Dar GH, Khan ZS (2011).*Ethnomedicinal uses of some plants in Kashmir Himalayas.* IJTK; **10**(2):362-366. 59.

Mukherjee P, Saha K, Balasubramanian R, Pal M, Saha Bp (1996).Studies on

psychopharmacological effects of Nelumbo nucifera Gaertn. Rhizome extract. *Journal of Ethnopharmacology*; **54**(2, 3); 63-67.

Navneet A.S (2017).Ethnomedicinal, Antimicrobial and Pharmacological aspects of Malva parviflora Linn: *A review Journal of Phytopharmacology* (*Pharmacognosy and Pytomedicine research*) **6**(4) :247-250.

Niwano Y, Saito K, Yoshizaki F, Kohno M, Ozawa T (2011).Extensive screening of herbal extracts with potential antioxidant properties. *J Clinic. Biochem*. Nutr; **48**(1):78-84.

Olusanya N. Ruth, Kolanisi Unathi,Ngobese Nomali and Chinsamy Mayashree (2021). Underutilization Versus Nutritional-Nutraceutical Potential of the Amaranthus Food Plant: *A Mini-Review* . *Appl. Sci.*11, 6879. https://doi.org/10.3390/ app11156879.

Papetti M, Daglia P, Grisoli, Dacarro C, Gregotti C and Gazzani G (2006). Anti- and pro-oxidant activity of Cichorium genus vegetables and effect of thermal treatment in biological systems," *Food Chemistry* ; **97**, no. 1, pp. 157–165,

Peschel W. F, Rabaneda Sanchez, Diekmann W (2006). An industrial approach in the search of natural antioxidants from vegetable and fruit wastes," *Food Chemistry*, vol. **97**, no. 1, pp. 137–150,

Rajendra Gyawali, Deepak Jnawali , Song Chang-Hun , Kyong-Su Kim (2012).Evaluation of the phytochemical profile and uterine contractile effect of Woodfordia fruticosa (L.) Kurz and Dipsacus mitis D. Don .*Journal of Nepal Pharmaceutical Association* XXVI(1).

Razavi SM, Zarrini G, Molavi G, Ghasemi G. 2011 Bioactivity of Malva Sylvestris L., a Medicinal Plant from Iran. *Iran J Basic Med Sci*.; 14(6):574-579.

Riaz I, Bibi Yamin, Nabeela Ahmad,Sobia Nisa, Qayyum Abdul (2021). Evaluation of nutritional, phytochemical, antioxidant and cytotoxic potential of Capsella bursa-pastoris, a wild vegetable from potohar region of Pakistan.*Kuwait J.Sci.,*Vol.**48** (3), pp (1-11)

Seyyed Mojtaba Mousavi,Seyyed Alireza Hashemi, Gity Behbudi, Sargol Mazraedoost,Navid Omidifar,Ahmad Gholami Aziz Babapoor and Pynadathu Rumjit Nelson (2021). A Review on Health Benefits of Malva sylvestris L. Nutritional Compounds for Metabolites, Antioxidants, and Anti-Inflammatory, Anticancer, and Antimicrobial Applications Evidence-Based *Complementary and Alternative Medicine Volume* 2021, Article ID 5548404, https://doi.org/10.1155/2021/5548404.

Subzar Ahmad Sheikh (2014).Ethno-medicinal uses and pharmacological activities of lotus (Nelumbo nucifera). *Journal of Medicinal Plants Studies*; **2**(6):42-46

Syed Najeebullah, Zabta khan Shinwari, Sohail Jan A, Khan Ibrahim and Ali Muhammad (2021).Ethno-medicinal and phytochemical properties of genus allium: A review of recent advances *Pak. J. Bot*., **53**(1): 135-144.

Thakur A, Singh Somvir, Puri Sunil (2021).Nutritional evaluation, Phytochemicals, Antioxidant and Antibacterial activity of Stellaria monosperma Buch.-Ham. Ex D. Don and Silene vulgaris (Moench) Garcke: wild edible plants of Western Himalayas.*Jordan Journal of Biological Sciences* **4**(1).

World Health Organization (2011).Prioritizing a preventable epidemic: a primer for the media of noncommunicable diseases.

Yan-Xi Zhou,Hai-Liang Xin,Khalid Rahman, Su-Juan Wang, ChengPeng, and HongZhang (2015). *Portulaca oleracea* L: A Review of Phytochemistry and Pharmacological Effects *BioMed Research International* http://dx.doi.org/10.1155/2015/92563.

Younes Najafian, Shokouh Sadat Hamedi, Masoumeh Kaboli Farshchi, Zohre Feyzabadi (2018). Plantago major in Traditional Persian Medicine and modern phytotherapy: a narrative review.*Electronic Physician* (ISSN: 2008-5842) Volume: **10**, Issue: 2, Pages: 6390-6399.

Zargar BA, Masoodi MH, Ahmed B, Ganie SA (2011).Phyto constituents and therapeutic uses of Rheum emodi wall. ex Meissn. *Food Chem*.; **128**(3):585-589.