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ETHNOBOTANICAL SURVEY OF ANTI-CONSTIPATION MEDICINAL PLANTS USED IN LASPUR VALLEY EASTERN HINDUKUSH RANGE DISTRICT UPPER CHITRAL PAKISTAN

Ghulam Qadir[1], Ghulam Mujtaba Shah[2*], Manzoor Hussain[3], Jan Alam[4], Khursheed Ur Rehman[5], Kifayat Ullah[6],

[1]PhD Scholar, Department of Botany, Hazara University, Mansehra, 21300, Pakistan,
Email: qadirchitralensis@hu.edu.pk
[2*]Professor Department of Botany, Hazara University, Mansehra, 21300, Pakistan,
Email: gmujtabashah@hu.edu.pk
[3]Professor Departments of Botany, Hazara University, Mansehra, 21300, Pakistan,
Email: mhussain8pk@yahoo.com
[4]Associate Professor Department of Botany, Hazara University, Mansehra, 21300, Pakistan,
Email: janalam@hu.edu.pk
[5]Ph.D Scholar, Department of Botany, Hazara University, Mansehra, 21300, Pakistan,
Email: khursheed823@yahoo.com
[6]Ph.D Scholar, Department of Botany, Hazara University, Mansehra, 21300, Pakistan,
Email: kaif.botany11@gmail.com

***Corresponding Author:** Ghulam Mujtaba Shah*, Ghulam Qadir**
*Email: gmujtabashah@hu.edu.pk,
**Email: qadirchitralensis@hu.edu.pk

Abstract

Background: Constipation is a prevalent gastrointestinal disorder in many low- and middle-income countries, including Pakistan. In the Laspur Valley, local communities heavily depend on traditional medicine as their primary source of healthcare. The objective of the present study was to document the indigenous knowledge and usage of medicinal plant species for the treatment of constipation by the local inhabitants.

Methods: Ethnomedicinal data was collected through semi-structured interviews on the use of medicinal plant species. A total of 88 informants (66 men and 22 women) were randomly selected. The data was quantitatively analyzed using Relative Frequency of Citation (RFC), Fidelity Level (FL), and Use Value (UV).

Results: A total of 36 medicinal plant species, representing 19 families, were documented in the study. Among them, Lamiaceae was the most prevalent family with 6 species, followed by Fabaceae (4 spp.), and Apiaceae and Polygonaceae (3 spp. each). Herbs constituted the dominant growth form (77.77%), followed by trees (13.88%) and shrubs (8.33%). The most used plant parts in herbal remedies were the whole plant (44.44%), followed by leaves and flowers (16.66% each). Decoction was the leading mode of herbal recipe preparation, and the herbal medicines were administered orally.

The medicinal plant species with the highest Use Value (UV) values were *Carthamus tinctorius* (0.48), followed by Juglans regia (0.43). The highest Relative Frequency Citation (RFC) value was

recorded for *Pennisetum typhoideum* (0.70), followed by *Vicia faba* (0.52). The species with a 100% Fidelity Level (FL) value was *Capparis spinosa*, followed by *Nepeta cataria* (96.96) and *Mentha longifolia* (96.77).

Conclusion: The study reveals that indigenous communities in the area still prefer therapeutic plants over synthetic drugs for treating various gastrointestinal disorders. However, this valuable traditional knowledge is currently limited to older individuals in the study area. There is a need to encourage younger generations to become involved in this knowledge and actively participate in its transmission. This engagement will contribute to the conservation of the use of medicinal plants for treating ailments in the study area, ensuring the continuity of this traditional practice.

Keywords: Ethnobotany, ethnomedicine, herbal remedies constipation, digestive disorders, gastrointestinal, Laspur Valley, Hindukush Range Pakistan

INTRODUCTION

The reliance on natural resources for healthcare in remote areas is significant, especially due to the limited access to modern medical services [1]. Indigenous medicine plays a crucial role in meeting the basic health needs of over 80% of the global population [2, [3]). However, the preservation of indigenous knowledge is increasingly threatened by modernization and evolving lifestyles within rural communities [4]. Constipation is characterized by infrequent bowel movements and difficult stool passage, typically lasting two weeks or longer [5]. Its diagnosis relies on evaluating stool consistency, the frequency of bowel movements, and the difficulty in passing stools. Constipation is a prevalent gastrointestinal issue worldwide, imposing significant economic burdens on societies [6]. This condition is primarily attributed to a lack of fiber in the diet, dehydration, insufficient water intake, sedentary lifestyle, exposure to warm climates, interruption of colonic motility during physical activity or in warm environments travel or changes in routine [7,8]. The use of certain medications containing antacids and analgesics [9]. Managing constipation involves employing osmotic and stimulant laxatives, fiber-rich medications, diets high in fiber, stool softeners, and behavioral modifications, including adjustments to diet and lifestyle [10].

This survey marks the inaugural initiative aimed at addressing constipation and related traditional remedies in the unexplored remote region of Laspur Valley in District Chitral, Khyber Pakhtunkhwa Province, Pakistan, where these disorders are particularly prevalent. The study endeavors to document the utilization of medicinal plants and traditional ethnobotanical knowledge employed in treating constipation and stomach ailments in the specified area. The primary goal is to contribute to the identification of crucial medicinal plants, laying the foundation for subsequent pharmacological and phytochemical analyses essential for managing intestinal disorders. Previous literature indicates that such investigations, especially in novel locations like the present site, may serve as the initial step in discovering new drugs [4, 11].

The current attempt aims to investigate the indigenous knowledge of medicinal plants used for treating constipation in Laspur Valley, Pakistan, a domain that remains uncharted in existing documentation. Consequently, the primary objectives of this study were twofold: (i) to record the traditional utilization of medicinal plants for constipation treatment, and (ii) to assess the ethnomedicinal data through quantitative indices such as FC (Frequency of Citation), RFC (Relative Frequency of Citation), UV (Use Value), and FL (Fidelity Level). These indices facilitate the evaluation of the most prevalent species esteemed for their efficacy in addressing constipation in the region.

MATERIALS AND METHODS

Study area.

Laspur Valley is situated in the northeast of Upper Chitral district in Pakistan, positioned between 36° 4′ 17.35″ N latitude and 72° 26′ 56.21″ E longitude, encompassing an altitudinal range of 2,850 meters above sea level. Geographically, it is bordered by Booni and Sonoghur Village to the west,

the Swat district to the south, the Ghazer district of the GB province to the east, and Mastuj to the north (Figure 1). Falling within the Irano-Turanian Region, the valley is irrigated by the river Laspur, covering an area of 640 square kilometers. The climate in the study area is characterized by a five-month snow cover lasting from November to March, featuring dry snow conditions. From April to the end of May, the climate shifts to windy and partly cloudy conditions. The annual average low and high temperatures in Laspur Valley exhibit a significant variation, ranging from -16°C during the cool season to 36°C in the hot season. The socio-economic status of the rural population in the community reveals a predominant reliance on herbal prescriptions for the treatment of various health disorders, as evidenced by studies conducted in the region [12].

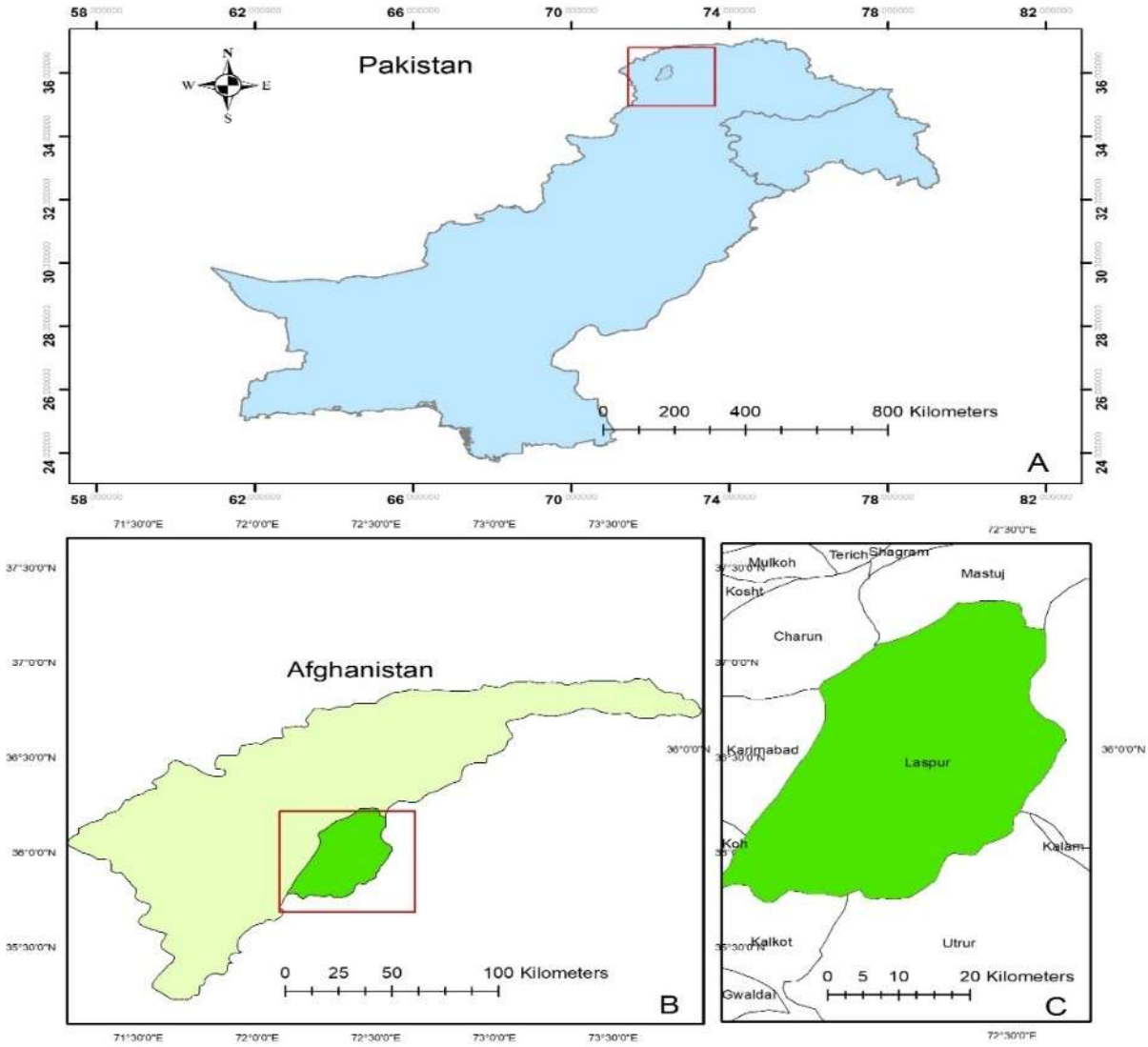

Fig.1. Map of study area

Ethnobotanical data collection

Medicinal plants collection

The ethnobotanical survey was conducted from March 2019 to October 2020. During this period, semi-structured interviews were carried out to gather insights into medicinal plant knowledge and usage, following the methodology outlined by [13,14]. A total of 88 informants participated in the study, comprising 62 men and 36 women. Informants were randomly selected from diverse

localities within the research area. The age range of the participants varied from 21 years to individuals aged 65 years and above. The study documented the life forms of plant species, identified the parts utilized for medicinal purposes, and recorded the methods of preparation and administration of herbal treatments. Medicinal plant specimens were collected during their flowering stage, pressed, dried, and mounted onto standard herbarium sheets. The specimen was identified with referenced with the flora of Pakistan [15,16].

To ensure accurate identification, the specimens were cross-checked through world flora online. Each plant specimen was assigned voucher number and deposited at the Department of Botany herbarium, Hazara University, Mansehra, for future reference.

Quantitative data analysis

Statistical analyses were conducted on the documented information utilizing the use value index (UVi) and relative frequency of citation (RFCs), following the methodologies outlined by [17,18] These indices were employed to quantify and assess the significance of medicinal plant usage in the study area.

Use Value index (UVi)

To ascertain the ethnobotanical status of used species, the use value index (UVi) was employed to provide a quantitative measure of their relative importance neutrally, as per the methodologies described by [19,17,18]. This study assesses the relative importance of each ethnobotanical plant species, considering the relative use reported by informants. The use value was calculated using the following formula. UVi ∑Ui/Ni

Where Ui is the number of informants interviewed for given species reports cited by informant Ni is the total number of informants interviewed for a given plant species.

Relative frequency citation (RFCs)

Relative frequency citation (RFC) was utilized to gauge the indigenous importance of each plant species, calculated through the following formula [18].
RfCs = FCs/N

Where FCs is the number of Informants who mentioned the use of plant species. N is the total number of informants.

Fidelity Level (FL) Value

fidelity (FL) is defined as the percentage of informants claiming the use of a plant species for the same main purpose. The FL of each species was calculated using the methodology adopted by [20,18].

$$FL\ (\%) = \iota\,\rho / \iota\,u \times 100$$

Ip is the number of informants who independently suggested the use of plant species against specific disease and Iu is the total number of informants who mentioned the same plant for any diseases.

RESULTS

Results Socio-demographic characteristics of participants

Eighty-eight (88) respondents were interviewed. Although people of various tribal ethnicities live in the Laspur Valley, traditional herbal medicine knowledge is supposed to be relatively uniform across the area. Informants were related with different livelihoods like farmers, hunters, shepherds,

shopkeepers, teachers, and wood cutters, which were belonging to different localities in the study area (Table 1).

Table 1. Demographic data of informants.

Variables	Categories	No. Persons	Percentage
Sex Ratio	Men	66	75%
	Women	22	25%
Age Groups	21-35	14	14.18%
	36-65	50	56.81%
	65+	25	28.40%
Education Level	Illiterate	52	59.09%
	Primary	20	22.72%
	Middle	07	7.95%
	High School	04	4.54%
	Graduate	03	3.40%
	Master	02	2.27%
Social Livelihoods	Farmer	53	60.22%
	Shepherds	11	12.5%
	Hunters	05	5.68%
	Wood cutters	04	4.54%
	Healers	05	5.68%
	Shopkeeper	06	6.81%
	Job holders	04	4.54%
Life Types	Town areas	34	38.63%
	Summer settlement areas	54	61.36%

Diversity and habit of medicinal plant species

In the current survey, a total of 36 medicinal plants from 32 genera and 19 families were documented for their use in the treatment of constipation (Table 2). The dominant family among them was Lamiaceae, comprising 6 species, followed by Fabaceae with 4 species. Other notable families included Apiaceae and Polygonaceae, each with 3 species, and Asteraceae, Eleaugnaceae, Moraceae, Poaceae, and Rosaceae, each with 2 species. Additionally, Amaranthaceae, Capparaceae, Iridaceae, Juglandaceae, Linaceae, Oleaceae, Phodophylaceae, Polygonaceae, Plantaginaceae, and Rosaceae were represented by 1 species each (Fig. 2).

In the present study, the growth forms utilized for the treatment of constipation predominantly comprised herbs, accounting for 28 species (77.77%), followed by trees with 5 species (13.88%) and shrubs with 3 species (8.33%) (Fig. 3). In terms of the herbal medicine source, the majority were obtained from the wild, constituting 25 species (69.44%), while cultivated sources contributed to 11 species (30.55%) (Fig. 4).

Plant parts used in herbal medicine

The most used plant part in herbal remedies was the whole plant, accounting for 44.44% of the cases, followed by flowers and leaves, each contributing 16.66%. Seeds were used in 13.88% of the instances, while shoots were utilized in 8.33%. Additionally, stems, fruits, and bulbs were each used in 5.55% of the cases, and roots were the least frequently used, accounting for 2.77% (Fig. 5).

Method of preparation and mood of utilization

Decoction was the dominant mode of preparation for herbal treatments, accounting for 44.44% of cases, followed by infusion at 33.33%, herbal tea, powder (8.33 % each), eaten with cured and paste (5.55 each) (Fig. 6). Most of the herbal medicines were taken orally (72.22%) followed by topical (27.77) (Fig.6).

Relative frequency of citation (RFC)

In this study, the Relative Frequency Citation (RFC) values ranged from 0.21 to 0.70. The highest RFC value was recorded for Pennisetum typhoideum.(Burm.f.) stapf, (0.70) followed by *Vicia faba*

L. (0.52), *Hordium distichon* L. *(*0.5), *Mentha spacata* L. and *Juglans regia* L. (0.48 each), *Elaeagnus angustifolia* L. (0.47) *Amaranthus hybridus* L. (0.46), (Table 2).

Use Value (UV)

The Use Value (UV) functions to ascertain the relative importance of medicinal plant species in the research area, with values ranging from 0.8 to 0.48. In this study, UV values varied within this range (Table 2).

The maximum UV value was recorded for Carthamus tinctorius L. at 0.48, followed by *Juglans regia* L. (0.43) *Mentha spacata* L. (0.41), *Ferula narthex* Boiss. (0.34), *Capparis spinosa* L. (0.33), *Hippophae rhamnoides* L. sub spp. *turkistanica* (0.34 each), Iris *germanica* L. (0.32) and Vicia faba (0.31). The lowest use value was reported for *Lagochillus cabulicus* Benth. (0.8) (Table 2).

Fidelity level (FL %)

High Fidelity Level (FL) values for certain medicinal plant species indicate their frequent use in treating constipation. In the recent study, FL values ranged from 60% to 100% (Table 2). The highest FL value was reported for Capparis spinosa L. 100%), followed by *Nepeta cataria* L. (96.96), *Mentha longifolia* L (L.) (96.77), *Juglans regia* L. (95.65), *Thymus laneris* Benth sub spp. *Hedgei* jalas (94.87), *Plantago major* L. (93.54) and *Carum carvi* L. (89.47). The lowest FL value was recorded for Amaranthus hybridus L. (60) used to constipation (Table.2).

Table 2. Medicinal plants voucher number, family, botanical names, local names, growth form, source, part use, method of preparation, method of utilization, FC, RFCs, Fl%, and Uvi.

V.No	Botanical Name	Local name	Family	Growth form	Source	Part Use	Mood of utilization	Mood of Application	FC	RFCs	*ip*	*lp*	FL (%)	UVi
HUP-8745	*Amaranthus hybridus* L.	Kroi shakhoo	Amaranthaceae	Ah	W	S**, L	Infusion	Oral	41	0.46	15	25	60	0.16
HUP-9052	*Peganum harmala* L.	Espandur	Zygophyllaceae	Ph	W	S	Paste	Topical	33	0.37	14	23	60.86	0.20
HUP-13489	*Mentha arvensis* L.	Pudina	Lamiaceae	Ph	W	W	Decoction	Oral	22	0.25	11	18	61.11	0.16
HUP-13520	*Hordium distichon* L.	Ishperseri	Poaceae	Ah	C	W	Decoction	Oral	44	0.5	17	26	65.38	0.24
HUP-8879	*Iris germanica* L.	Sawsan	Iridaceae	Ph	C	W	Infusion	Oral	27	0.30	17	26	65.38	0.32
HUP-8893	*Lagochillus cabulicus* Benth.	Asqar zokhu	Lamiaceae	Ph	W	S**, F	Decoction	Topical	37	0.42	10	15	66.66	0.08
HUP-8921	*Moras nigra* L.	Shayekii	Moraceae	T	C	W	Decoction	Oral	22	0.25	16	24	66.66	0.18
HUP-8768	*Allardia tomentosa* Decne.	Dronu gmburi	Asteraceae	Ph	W	F	Infusion	Topical	34	0.38	16	24	66.66	0.22
HUP-13490	*Mentha spacata* L.	Saspru	Lamiaceae	Ah	C	W	Infusion	Oral	43	0.48	17	25	68	0.41
HUP-8916	*Linum usitatissimum* L.	Shetiki	Linaceae	Ph	C	W	Decoction Powder	Oral	35	0.39	13	19	68.42	0.16
HUP-13472	*Foniculum vulgare* Mill	Bodioung	Apiaceae	Ph	W	L, S	Herbal tea	Oral	33	0.37	18	26	69.23	0.18
HUP-9007	*Cotoneaster horizontalis* Decne.	Mekeni	Rosaceae	Sh	W	W	Decoction	Topical	22	0.25	17	24	70.83	0.10
HUP-8920	*Moras Alba* L.	Mrach	Moraceae	T	C	W	Decoction	Oral	34	0.38	15	21	71.42	0.22
HUP-8737	*Allium Carolinianum* DC.	Kach	Alliaceae	Ph	W	B	Infusion	Oral	34	0.38	13	18	72.22	0.24
HUP-8739	*Allium sativa* L.	Theshtoo	Alliaceae	Ph	C	B, L	Infusion	Oral	22	0.25	19	26	73.07	0.22
HUP-13457	*Astagalus psilocentros* Fisch.	Garmenzu	Fabaceae	Ph	W	W	Decoction	Oral	23	0.26	14	19	73.68	0.13
HUP-8991	*Rumex longifolius* Dc.	Serkonzu	Polygonaceae	Ph	W	L	Decoction	Topical	19	0.21	14	19	73.68	0.14
HUP-8971	*Podophyllum emodi* wall.ex Royl	Mamekh	Podophyllaceae	Ph	W	R	Decoction	Topical	29	0.32	20	27	74.07	0.11
HUP-13507	*Trygonella corniculata* L.	Sugunu	Fabaceae	Ah	W	W	Infusion	Oral	39	0.44	29	38	76.31	0.10
HUP-13510	*Oxyria digyna* (L.)S.F.Gray	Shut shakh	Polygonaceae	Ph	W	W	Decoction	Oral	34	0.38	29	38	76.31	0.16

HUP-9061	*Carthamus tinctorius* L.	Poam	Asteraceae	Ph	C	F	Powder	Topical	37	0.42	15	19	78.94	0.48
HUP-8950	*Medicago lupulina* L.	Zomo mushuch	Fabaceae	Ah	W	S** L	Eaten with Cured	Oral	36	0.40	19	24	79.16	0.09
HUP-8757	*Ferula narthex* Boiss.	Raw	Apiaceae	Ph	W	S *	eaten with Cured	Oral	35	0.39	19	24	79.16	0.34
HUP-8946	*Vicia faba* L.	Aandalu	Fabaceae	Ah	C	F, S	Infusion	Oral	46	0.52	12	15	80	0.31
HUP-8855	*Eleagnus angustifolia* L	Shunjur	Eleagnaceae	T	W	F*	Herbal tea,	Oral	42	0.47	30	37	81.08	0.26
HUP-	*Pennisetum typhideum* (Burm.f.)stapf	Contoli Olen	Poaceae	Ah	C	W	Decoction	Oral	62	0.70	22	27	81.48	0.15
HUP-13493	*Fraxinus excelsior* L.	Toor	Oleaceae	T	W	F	Decoction	Topical	34	0.38	27	33	81.81	0.13
HUP-8856	*Hippophae rhamnoides* L. sub spp *turkistanica*	Mirghenz	Eleagnaceae	Sh	W	F*	Eaten with cured, infusion	Oral	28	0.31	24	29	82.75	0.33
HUP-8992	*Rheum tibeticum* Maxim.ex.Hook.F.	Eshpar	Polygonaceae	Ph	W	S*	Decoction	Oral	33	0.37	29	33	87.87	0.30
HUP-8753	*Carum Carvi* L.	Hojojj	Apiaceae	Ph	W	S	Herbal tea	Oral	32	0.36	17	19	89.47	0.26
HUP-8975	*Plantago major* L.	Ispaghol	Plantaginaceae	Ph	W	L, S, F	Infusion	Topical	32	0.36	29	31	93.54	0.22
HUP-8891	*Thymus lineris* Benth. Sub *Hedgei* Jalas	Sew	Lamiaceae	Ph	W	W	Infusion	Oral	39	0.44	37	39	94.87	0.20
HUP-8881	*Juglans regia* L.	Bermogh	Juglandaceae	T	C	W	Paste	Oral	43	0.48	22	23	95.65	0.43
HUP-8804	*Mentha longifolia* (L.) L.	Bain	Lamiaceae	Ph	W	W	Infusion	Oral	33	0.37	30	31	96.77	0.18
HUP-8901	*Nepeta cataria* L.	Mutruch	Lamiaceae	Ph	W	W	Decoction	Topical	27	0.30	32	33	96.96	0.19
HUP-8817	*Cappris spinosa* L.	Kaveer	Capparaceae	Sh	W	F, B*	Decoction	Oral	29	0.32	29	29	100	0.33

Key to table: H=Herbs, Sh=Shrubs, T=Trees, Source; C=Cultivated, W=Wild, Part use; R=Root, B=bulb, F=Flower, F *=fruit, S *=Stem, S =Seed, S **=shoot, L=leaves, FC=, RFCs=relative frequency citation, Fl%= fidelity level and Uvi= use value index

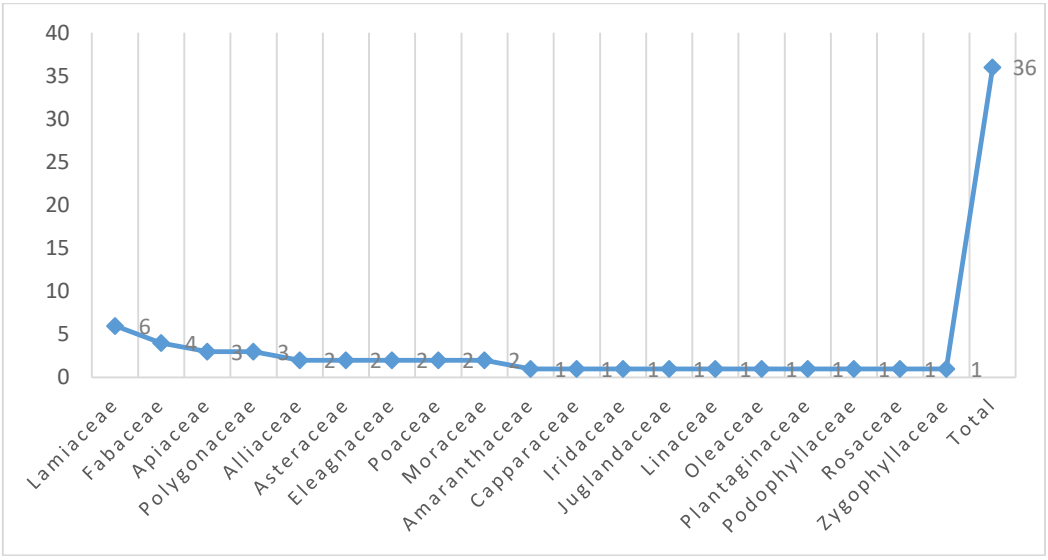

Fig.2. Distribution of species within families

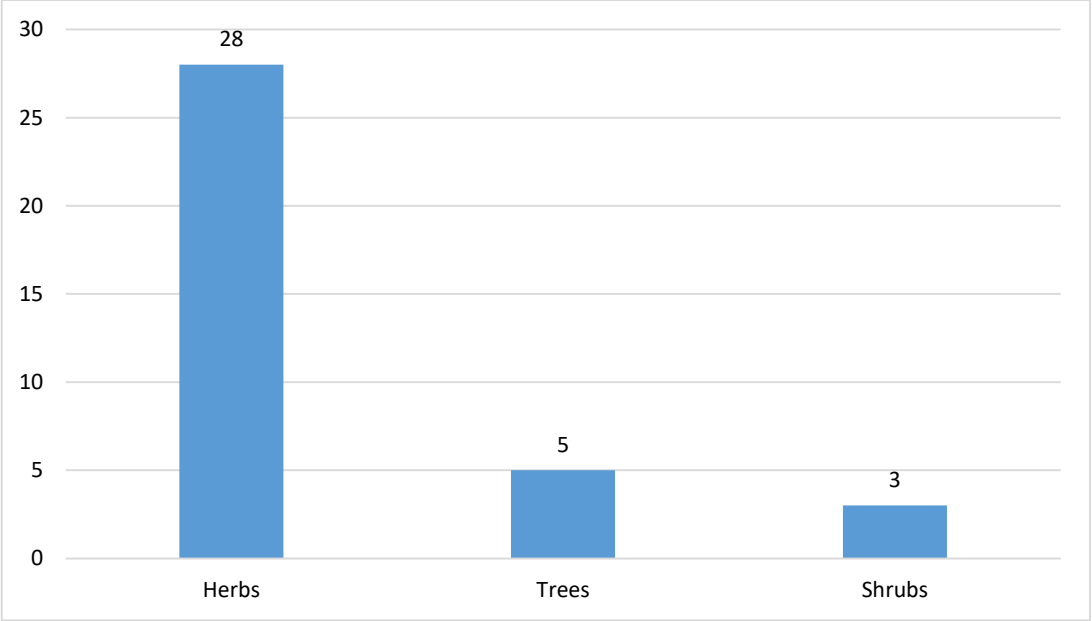

Fig.3.Growth form of medicinal used for constipation.

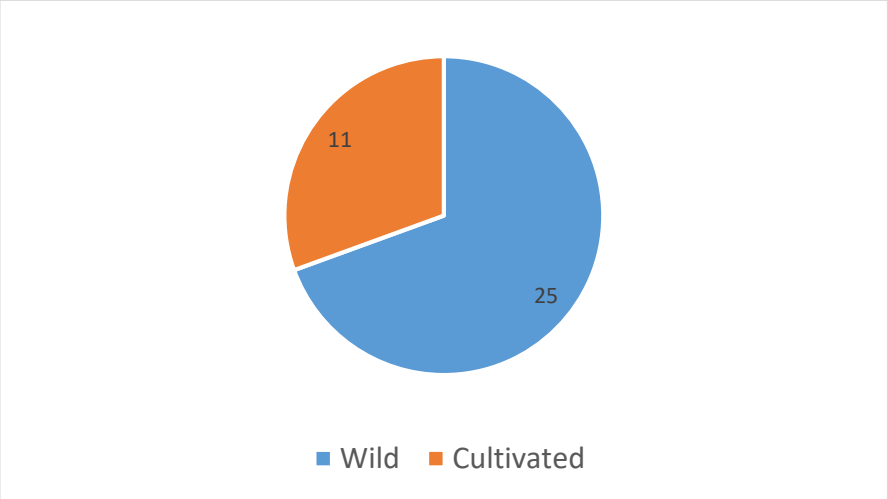

Fig. 4. source of medicinal plants used for constipation.

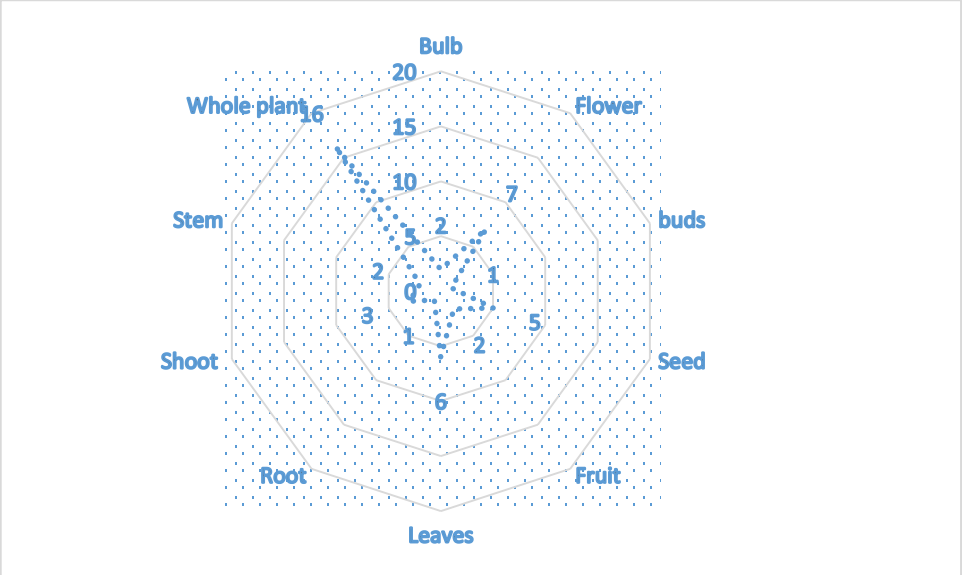

Fig.5.Part used of medicinal plants.

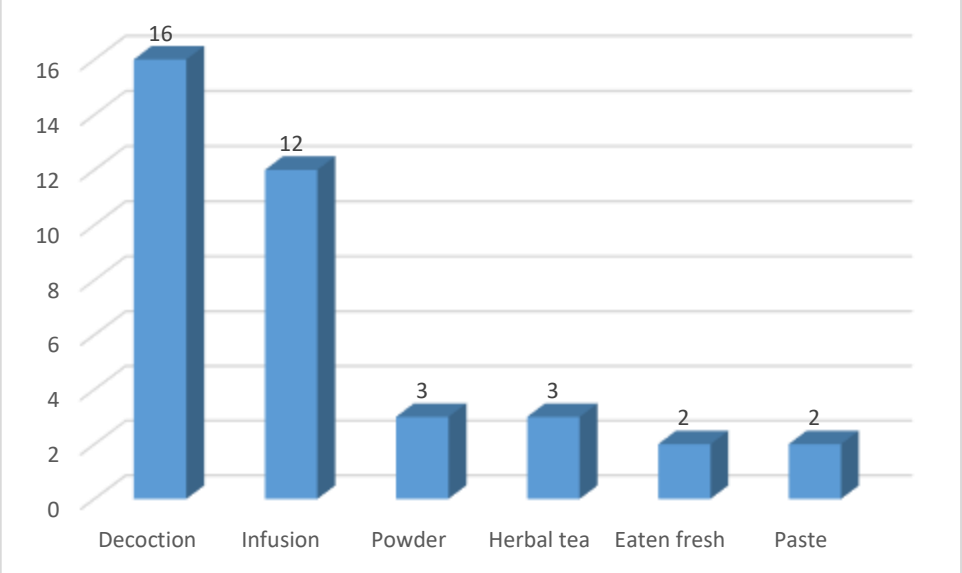

Fig.6. Method of preparation medicine

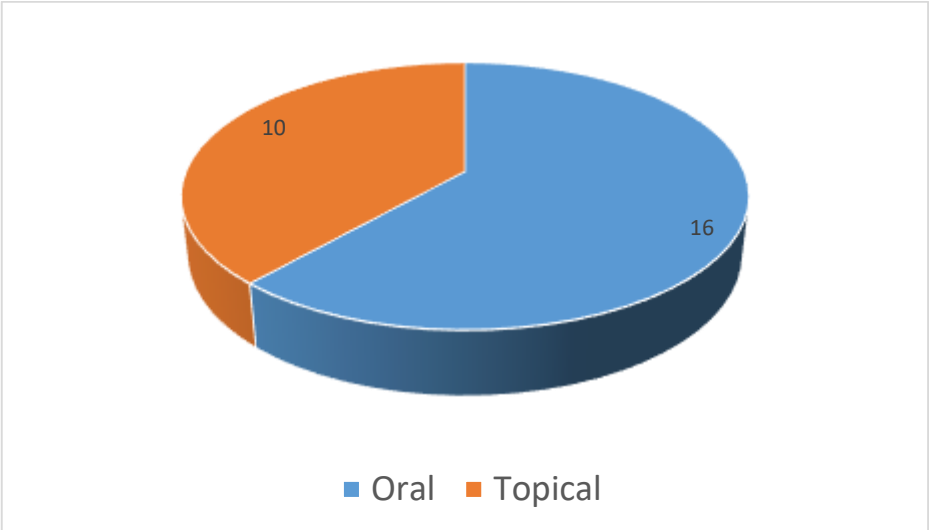

Fig. 7. Method of utilization of herbal medicine

Novelty and future impact

All the mentioned plants were documented for the first time for the treatment of constipation in the Laspur Valley. This marks the first-ever ethnomedical study conducted in the Laspur Valley, and it holds significant value as a reference for conservation efforts. The findings of this study can inform conservation planners about the importance of medicinal flora in the traditional healthcare system. It provides a foundation for planning the sustainable maintenance and consumption of these medicinal plants in the region.

DISCUSSION

In the current study, thirty-six medicinal plants used for the treatment of constipation belonged to 32 genera and 19 families. It was observed that the number of male informants exceeded that of female informants, suggesting a cultural barrier in the research area. This could be attributed to social norms where women may not engage in conversations with unrelated men, except for family members or close relatives. Furthermore, it was noted that senior informants possessed more traditional medicinal knowledge, indicating a generational gap, with younger generations displaying less interest in traditional knowledge of medicinal plants.

This observation highlights the vulnerability of indigenous information, indicating that it is currently not adequately recorded and preserved, potentially facing the risk of disappearance soon. Our findings align with studies conducted by [21,22]. The dominant families identified were Lamiaceae, followed by Fabaceae, Polygonaceae, and Apiaceae. While this supports the findings of other researchers, there may be some conflicting results due to regional differences, as noted in studies by [23,24,22] .It's noteworthy that several species of the Apiaceae family are widely used to treat various gastrointestinal disorders in different parts of the world, as indicated by [12] .In another study, it was found that Asteraceae was the most frequently used plant family against gastrointestinal ailments [52,26,27].The predominant habit employed for herbal medicine preparation was herbs, aligning with findings from studies by [12,28 .29]. Herbs are known to contain a high number of bioactive compounds [30,31]. They are easily accessible and tend to thrive in high-altitude regions. The most utilized plant part for herbal preparation was the whole plant, followed by leaves, which are convenient to collect and not influenced by seasonality. This preference for herbaceous plants ensures accessibility throughout the year [25] [52,32]. The dominant plant part used in herbal remedies was the whole plant, followed by leaves. The preference for fresh plant materials may stem from the higher concentration of bioactive ingredients compared to dry specimens, where exposure to sunlight and air drying could lead to the reduction or volatilization of these bioactive compounds [33]. The collection of leaves is also considered less destructive compared to other plant parts [34]. Similar findings have been reported in the use of leaves for treating gastrointestinal disorders in various studies [18,35,36,22]. Traditional therapists in the study area employ several methods of preparation, with decoction being the dominant mode. This choice may be attributed to the simplicity of the preparation procedure, as suggested by [37.] Another commonly used method is infusion for the treatment of diseases [52,11]. The prevalence of decoction as the dominant method of preparation for folk medication aligns with findings from other studies [30 ,38,39 22].In our study, the dominant application of herbal medicine was oral, and similar results have been reported, with oral administration being the most utilized route for treating constipation disorder in various studies [28,39,40,41, 42, 43] .The choice of the route of administration can impact the therapeutic effect of each plant in terms of duration, target remedy, and the control of treatment to a particular region [35].

The prevalence of constipation in the research area could potentially be attributed to poor access to clean drinking water for most inhabitants [44]. Medicinal plant species with relatively higher Relative Frequency Citation (RFC) values (Table 2) indicate that these therapeutic plants are widely recognized among many native therapists [18 ,45]. Folk medicinal plant species with high RFC values should undergo further assessment for drug and phytochemical analysis to identify their

active components for potential medication preparation [46,22]. Therapeutic plants with higher Use Values (UV) (Table 2) may be attributed to their widespread distribution and frequent use in the research area [47,17]. However, it is essential to note that therapeutic plant species with low Use Values (UV) are not necessarily less significant; rather, it indicates that information on these plant species is less readily available [48]. Fidelity Level is used to determine the therapeutic plants that are predominantly preferred by the residents for the cure of diseases (Table 2). Some researchers have reported the highest Fidelity Level (FL) values for gastrointestinal disorders [49]. The predominant plant family recorded was Lamiaceae, followed by Fabaceae, Apiaceae, and Polygonaceae. Similar results have been reported in other studies, such as those conducted by [50,51]. The discovery of drugs from therapeutic plant species requires a multidisciplinary approach that combines ethnomedicinal and pharmacological methods. However, it's important to note that none of the medicinal plants in the current study underwent comprehensive pharmacological screenings.

CONCLUSIONS

The Laspur Valley is identified as one of the most diverse, rich, and unique regions in Pakistan. The significant number of anti-constipation medicinal plants documented in the current study not only reflects the diversity of the area but also highlights the indigenous uses of these plants.

Constipation poses health challenges for inhabitants in specific communities in Pakistan. Given the limited financial resources and lack of basic medical facilities, people in these areas rely on medicinal plant species for the treatment of such ailments. Traditional knowledge regarding therapeutic plants and the preparation of herbal remedies for the treatment of constipation remains prevalent in the remote area of Laspur Valley.

During the survey, 36 medicinal plant species from 19 families were documented in the study area. Among the medicinal plants, those with the highest Use Value (UV) included Carthamus tinctorius, Juglans regia, Mentha spicata, Ferula narthex, and Capparis spinosa. Notably, the highest Relative Frequency Citation (RFC) values were reported for *Pennisetum typhoideum, Vicia faba, and Hordium distichon*. The medicinal plants with a 100% Fidelity Level were reported for Capparis spinosa, followed by *Nepeta cataria, Mentha longifolia*, and *Juglans regia*, precisely for constipation by the indigenous inhabitants. However, their populations are facing severe reduction in the area due to excessive use, emphasizing the need for serious conservation actions to ensure their sustainable utilization. Furthermore, these findings present opportunities for future studies to delve into classifying herbal laxatives based on their treatment mechanisms and exploring the discovery of new drugs.

Declarations

List of abbreviations: Relative Frequency of Citation (RFC), Use Value (UV) and Fidelity Level (FL).

Ethics statement: Prior to the survey, we obtained oral informed consent from each participant.

Consent for publications: Not applicable.

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Conflicts of Interest: The authors declare that there are no conflicts of interest for this article.

Availability of data and materials: The figures and tables supporting the results of this study are included in the article, and the original data sets are available from the first author upon request.

Authors' contributions: The manuscript was written by Ghulam Qadir. Ghulam Mujtaba Shah and Manzoor Hussain supervised this work. All the authors approved the final manuscript after revision.

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