A Cross-Cultural Analysis of Medicinal Plant Utilization among the Four Ethnic Communities in Northern Regions of Jammu and Kashmir, India

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Simple Summary: Local ethnic communities have accumulated good traditional ethnomedicinal knowledge on the utilization of plant resources through many generations. In order to preserve and utilize traditional ethnomedicinal knowledge sustainably in the future, ethnobiologists have recently focused on cross-cultural research to record and evaluate the processes driving this system of knowledge evolution within a particular group. The current study records the traditional ethnomedicinal knowledge of plant resources from four ethnic groups in the northern districts of the Union territory of Jammu and Kashmir. A total of 109 plants from 35 families were recorded as being used for the treatment of various disorders by these communities. Asteraceae was found to be the dominant family, with herbs contributing the highest percentage of 86%. The Bakerwal, Gujjar, and Pahadi ethnic groups showed a higher similarity (14% species) in the use of plants, whereas the Bakerwal and Kashmiri ethnic groups used plants with the least similarity (1%). In order to better understand the various traditional plant-use systems, the current study is a collaborative effort that includes not only the documentation but also cross-cultural comparisons of the reported species. This will not only broaden the understanding of cross-cultural ethnobotany in the area but will also create possibilities for locals to benefit from rewards for showcasing their knowledge and taking part in future development projects.

Abstract: Medicinal plants are utilized around the globe for the treatment of a wide range of ailments. This study is an attempt to document the utilization of medicinal plants across the four different cultural groups residing in the rural and remote villages of the northern districts of the Union territory of Jammu and Kashmir, India. To gather information related to medicinal plants and health care practices among the local folk, field surveys were conducted from February 2018 to May 2021. The ethnomedicinal information was gathered through semi-structured interviews and group discussions. During the study, a total of 109 plant species belonging to 35 families were recorded as commonly utilized by the local population, with Asteraceae reported as the dominant family. The most common growth form was herbs, with a percentage contribution of 86%. Leaves (38%) were the most commonly used plant part for the preparation of traditional remedies, and most of the remedies were prepared as paste and applied topically. The highest use value of 0.30 was reported for Capsella bursa-pastoris. Greater similarity (14% species) in the usage of plants was shown by Bakerwal, Gujar, and Pahadi ethnic groups, whereas the least similarity (1%) was observed between Bakerwal and Kashmiri ethnic groups. Based on the results obtained in the present study, further phytochemical
and pharmacological analysis of plants is recommended to confirm the efficacy and safety of the remedies used and to possibly elucidate candidates for the development of new drugs.

**Keywords:** ethnomedicine; cross-cultural analysis; four ethnic communities; North Kashmir

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**1. Introduction**

Indigenous plant medicine is still considered an essential part of healthcare systems across the globe, and traditional medicine comprises both orally transmitted therapeutic methods and codified systems [1]. The use history of medicinally important plants has always been linked with human culture [2]. Of about 350,000–400,000 plant species across the globe, several thousand are utilized to alleviate different disorders [3,4]. According to the World Health Organization (WHO), about 80% of the world’s population still depend on indigenous medicines, and a large population in remote and rural areas uses these medicines as their first line of defense against many ailments [5], especially due to their low cost, acceptability, biomedical benefits and easy accessibility. There is also a growing demand for traditional remedies across the globe [6], and an increasing number of studies on medicinal plants are being published [7].

In India, an estimated 1.5 million healers utilize about 25,000 plant-based traditional remedies. About 6400 flowering plants are believed to have medicinal values, although not more than 10% of these are utilized in modern pharmaceutical industries [8–10]. While a variety of studies have been conducted to explore the knowledge associated with traditional healthcare systems of ethnic communities in remote areas of India [11,12], no such detailed report has been published on the cross-cultural utilization of medicinal plants from North Kashmir Himalayas. The northern region of the Kashmir Himalayas, with a total of three districts, including Bandipora, Baramulla, and Kupwara, is a well-characterized part of the greater Himalayas, with a great diversity of flora and fauna [13–15]. Most of the populations of these districts reside in rural and remote villages with negligible access to modern healthcare facilities. This study aims to explore the traditional knowledge associated with medicinal plants utilized across the four linguistic ethnic groups, including the Gujjar, Bakerwal, Pahadi, and Kashmiri ethnic groups of North Kashmir. Recent studies have documented the cross-cultural utilization of plant resources, such as in the Balti, Beda, and Brokpa groups in the Trans-Himalayan region of Ladakh and other areas [16]. This research studied how the wild flora of Kashmir Himalaya could improve local life and contribute to the eradication of poverty by providing an in-depth understanding of the ethnomedicinal plant diversity in the region.

According to the recommendation made by the Convention on Biological Diversity [17], local knowledge should be incorporated into future development processes to achieve sustainability because sustainability cannot be attained without taking into account the local knowledge of communities that have a long-standing relationship with their natural resources, including plants. A comprehensive strategy should be used to address the impending extinction problem, as Maffi et al. [18] suggest, to ensure the sustainability of the world. Researchers must concentrate on preserving local and traditional knowledge as a foundation for long-term sustainability in this difficult scenario. In addition to aiding in the protection of traditional knowledge, the field of ethnobiological studies will persuade policymakers to concentrate on the social sustainability of ethnic groups to realize long-term sustainable aims. The current study highlights the historical stratifications and economic standing of the research groups and compares the documented taxa across cultures to comprehend distinct traditional plant usage systems. This will not only increase the region’s understanding of cross-cultural ethnobotany but will also create opportunities for the local population to receive rewards for promoting and celebrating their expertise and participating in future development initiatives. This study focuses on the comprehensive assessment of plant resources with the following objectives: (1) to
document the ethnomedicinal uses of the local flora among the different ethnic groups of Kashmir Himalaya, and (2) to make a cross-cultural comparison of the ethnomedicinal uses of the quoted plants.

2. Materials and Methods

2.1. Study Area

Jammu and Kashmir, a former state and now the Union territory of India, stretches over an area of 42,241 km$^2$ and has a unique climatic condition and a rich ethnic and phonological diversity. The region is situated to the west of Ladakh, north of Himachal Pradesh, and west of Punjab, and it shares international borders with Pakistan and China to the east. The Jammu and Kashmir state (Jammu, Kashmir, and Ladakh), now a Union territory, has two biogeographic provinces, i.e., Jammu and Kashmir. Geographically, Jammu and Kashmir comprise rugged mountains and barren slopes with climate categories according to the Koppen classification [19]. The main Himalayan range runs along the valley’s northeastern flank. The present study was conducted in the northern region of the Kashmir province (Figure 1). The Kashmir valley has an average elevation of 1850 m above sea level (masl). The broader areas surveyed during the present study included the areas of the districts Bandipora (74°39’ E longitude and 34°25’ N latitude), Baramulla (74°41’ E longitude 34°22’ N latitude), and Kupwara (74°15’ E longitude and 34°01’ N latitude). The region provides a home to different linguistic communities such as Gujar, Bakerwal, Kashmiri, and Pahadi. The Kashmiri are the descendants of an Indo-European ethnolinguistic group [20], the Pahadi show their descent from the Kash Empire [21], and the Gujar and Bakerwal are believed to have migrated from Gujarat and the Hazara division of the northwestern frontier province [22]. The region is gifted with rich floral diversity with enormous economic potential. *Fritillaria cirrhosa*, *Trillium govanianum*, *Aconitum heterophyllum*, *Podophyllum hexandrum*, *Rheum webbianum*, and *Bergenia ciliata* are the important medicinal plants collected by the indigenous population for their livelihood. People of the area have no proper access to modern education services and health care facilities and are thus entirely dependent on locally available medicinal plants for their health care.

![Figure 1. Map highlighting the broader areas surveyed.](image-url)
2.2. Demographic Status of Respondents

To gather the ethnomedicinal information from the study region, a total of 237 informants were selected, with an age group ranging from 18–76 (Table 1). Of the 237 informants, 76 were Gujjar, 51 were Bakerwal, 71 were Kashmiri, and 39 were Pahadi. Most of the informants were in the age group of 56–76 years (41%). Among the interviewed informants, the percentage of illiterate informants was high (67%), and this might be due to the limited educational facilities in the rural and remote villages of the Kashmir valley. A small number of informants had completed their primary and secondary level education. The majority of informants were men (74%), and women comprised 26%. This is because of the cultural norms in which only old-aged women are given access to rituals on any celebration day. The majority of females were not allowed to talk to males outside their community. For these reasons, there was less involvement of women compared to men during the documentation of ethnomedicinal knowledge [23].

Table 1. Demographic status of respondents from North Kashmir Himalayas.

| Demographic Features | Total | (Linguistic) Ethnic Groups |
|----------------------|-------|---------------------------|
| Respondents          | 237   | Gujjar | Bakerwal | Pahadi | Kashmiri |
| Language             |       | Gujri | Urdu     | Gujri | Pahadi | Urdu | Pahadi | Urdu | Kashmiri | Urdu |
| Gender               |       | Male | 176     | 56    | 38     | 29   | 53     |     |
|                      |       | Female | 61   | 20    | 13    | 10   | 18     |     |
| Age range (Years)    |       | (Young) 18–28 | 57 | 19 | 14 | 9 | 15     |     |
|                      |       | (Middle-aged) 29–55 | 83 | 27 | 18 | 13 | 25     |     |
|                      |       | (Old) 56–76 | 97 | 30 | 19 | 17 | 31     |     |
| Profession           |       | Farmers | 29 | 10 | 4 | 3 | 12 |     |
|                      |       | Shepherds | 45 | 9 | 25 | 8 | 3 |     |
|                      |       | Semi-skilled workers | 46 | 15 | 2 | 10 | 19 |     |
|                      |       | Skilled workers | 32 | 13 | 4 | 5 | 10 |     |
|                      |       | Shopkeepers | 26 | 11 | 2 | 1 | 12 |     |
|                      |       | Job holders | 22 | 9 | 2 | 1 | 10 |     |
|                      |       | Housewives | 37 | 9 | 12 | 11 | 5 |     |
| Livelihood source    |       | Agriculture and Cattle rearing |  |  |  |  |  |  |
|                      |       | Pastoralism |  |  |  |  |  |  |
|                      |       | Agriculture and Cattle rearing |  |  |  |  |  |  |
|                      |       | Agriculture and Cattle rearing |  |  |  |  |  |  |
| Descendants of       |       | Northwestern Frontier Province |  |  |  |  |  |  |

2.3. Data Collection

To gather information regarding the usage of plants in the study region, field surveys were conducted from February 2018 to May 2021. The data were collected using semi-structured interviews, group discussions, and field observations. Data regarding the human diseases treated, the local names of the plants used, the parts used, the methods of preparation, and the routes of application were gathered during the interviews. Interview questionnaires were prepared in English and then translated into local languages.
In group discussions, key informants were selected with the help of knowledgeable persons in each village. Special care was taken to avoid non-genuine information [24], and responses were cross-checked through informal methods for confirmation. Consent was always obtained verbally before conducting every interview [10,25]. The project objectives and procedures were clearly explained in the local language to the informants. During field observation, plants, along with their usage, were collected. Much effort was made to collect the plants from their natural habitats in the flowering stage.

2.4. Preservation and Taxonomic Verification of Collected Plants

Standard herbarium techniques were used for the collection, drying, mounting, preparation, and preservation of voucher specimens [26]. All the voucher specimens were collected in triplicate, prepared, and then identified with the help of “The Flora of Jammu and Kashmir” [27] and the taxonomists in the field. The botanical nomenclature of the plants was verified using various online platforms (IPNI, Tropicos, and The Plant List). All the identified plant specimens were then verified at the KASH herbarium of the Department of Botany, University of Kashmir, Srinagar, Jammu, and Kashmir, India. The preserved specimens were deposited at the aforementioned herbarium for future reference.

2.5. Data Analysis

2.5.1. Overlap Analysis for Cited Plant Species

The ethnomedicinal data of all four communities (Gujjar, Bakerwal, Kashmiri, and Pahadi) were compared. Data are represented in the form of a Venn diagram using the Bioinformatics and Evolutionary Genetics portal (https://bioinformatics.psb.ugent.be/cgibin/liste/Venn/calculate_venn.html, accessed on 1 April 2021) to illustrate overlaps in the use of taxa.

2.5.2. Use Value (UV)

The use value determines the relative importance of known plant species. In the present study, it was calculated using the following formula [28]:

\[
UV = \frac{\sum U_i}{N}
\]

where \( U_i \) is the total number of uses reported by each informant for a given plant species and \( N \) defines the total number of informants participating in the study. The use value is high when there are many use citations for a plant and vice versa.

3. Results and Discussion

3.1. Diversity of the Ethnomedicinal Flora

During the present study, a total of 109 plant species belonging to 35 families were found to be utilized by the people of the study area. Among the reported families, Asteraceae contributed the highest number of species (32 species or 29%), followed by Lamiaceae (9 species or 8%), Fabaceae (6 species or 6%), Brassicaceae (5 species or 5%), Malvaceae (4 species or 4%), and Solanaceae, Pinaceae, Rosaceae, Geraniaceae, Apiaceae, Poaceae, Amaranthaceae and Polygonaceae (3 species or 3% each); all other families contributed less than three species (Figure 2). Likewise, Asteraceae has also been recorded as a dominant family in traditional medicine in other ethnomedicinal studies across India and the rest of the world [29–31]. The dominance of this family might be due to its herbaceous life form, extensive distribution, and richness in the study area, and members of this family are well-known for their aromatic quality [32,33]. A large number of species were monotypic, i.e., with one species each, similar to other studies conducted earlier [25,34,35]. Despite their diversity, members of each family are distinguished by their ability to synthesize secondary metabolites with potentially significant biological activity. As a result, they are used in a variety of ways in the traditional healthcare system [36]. For each reported plant
species, the botanical name, voucher number, vernacular name, family, habit, part used, preparation, application, ailments treated, and use value were recorded (Table 2). Local people believed that raw materials collected from dense forests or areas less accessible by humans had better efficacy. They, however, often cultivated *Vitis vinifera*, *Trigonella foenum-graecum*, *Mentha arvensis*, *Lavatera cashmiriana*, *Ficus carica*, and *Cyndonia oblonga*, among other species, in their gardens since these plant species were hardly available in the wild.

Herbs were reported to be the most used life form of the plants (94 species or 86%), followed by trees (9 species or 8%), and climbers and shrubs (3 species or 3% each) (Figure 3). Several other studies from the Kashmir Himalayas and other parts of the world also reported herbs to be the dominant plant species used by local people and practitioners [29,37,38]. The recurrent utilization of herbaceous plants by the local communities of the region can be interpreted to be a result of the rich herb diversity in the environment [39,40]. The people who use medicinal plants in their health care system believe that the materials collected from the deep forests and less human-accessible regions have more curing properties for different types of diseases [11].

**Figure 2.** Species contribution of different families.

**Figure 3.** Species contribution of plants according to life form.
Table 2. Medicinal plants used by the indigenous people of North Kashmir Himalayas.

| Family       | Botanical Name/Voucher Number | Local Name      | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Ailments Treated       | UV  |
|--------------|-----------------------------|-----------------|----------------------------------|-------|--------------|-------------|-------------|------------------------|-----|
|              |                             | Gujar Bakerwal  | Pahadi Kashmiri                  |       | LF           | Decoction   | Oral        | Dysentery              |     |
| Amaranthaceae| *Achyranthes aspera* L. 3353-KASH | Phutkunda       | Y Y N N H                         |       | WP           | Paste Infusion | Topical     | Skin rashes Rheumatism | 0.12|
|              | *Amaranthus caudatus* L. 3361-KASH | Liss            | Y Y Y Y H                         |       | LF           | Decoction   | Oral        | Diarrhea Indigestion Laxative | 0.08|
|              | *Amaranthus viridis* L. 3364-KASH | Wazij liss      | Y Y Y N H                         |       | LF           | Paste Infusion | Topical     | Pimples Joint pain Abdominal pain | 0.15|
| Apiaceae     | *Coriandrum sativum* L. 2975-KASH | Daniwal         | Y Y Y N H                         |       | WP           | Decoction Infusion | Oral        | Pimples Jaundice       | 0.19|
|              | *Daucus carota* L. 3390-KASH | Gazer           | N N N Y H                         |       | LF           | Juice Infusion | Oral        | Anthelmintic Dysentery Fatigue Lactation | 0.18|
|              | *Foeniculum vulgare* Mill. 3397-KASH | Badiyan         | Y Y N Y H                         |       | FR           | Decoction Juice Infusion | Oral        | Colic infection Gum disease Sore throat | 0.13|
|              | *Acorus calamus* L. 3365-KASH | Vai-gander      | Y N N Y H                         |       | RH           | Infusion Infusion | Oral        | Antispasmodic Anthelmintic Acidity | 0.20|
| Araceae      | *Arisaema Jacquemontii* Blume. 2968-KASH | Hapet-Gogji     | Y Y N N H                         |       | RT           | Paste Infusion | Topical     | Blisters               | 0.19|
| Family | Botanical Name/Voucher Number | Local Name | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Ailments Treated | UV |
|--------|-------------------------------|------------|----------------------------------|-------|-------------|-------------|-------------|-----------------|----|
|        |                               |            | Gujar                           | Bakerwal | Kaharsi     |             |             |                  |    |
| Asteraceae |                               |            | Pahadi          | Kashmiri |             |             |             |                  |    |
|        |                               |            | N           | N         | N         | Y         | H         | Infusion Infusion Oral Oral | Stomach pain Dysentery | 0.17 |
|        |                               |            | Fakh-gass    | N         | Y         | N         | H         | Juice Decoction Topical Topical | Skin antiseptic Skin allergy Muscle pain Burns | 0.22 |
|        |                               |            | Phughood    | N         | N         | Y         | Y         | Paste Paste Paste Paste | Boils Burns Blister | 0.11 |
|        |                               |            | Tethwan     | Y         | N         | Y         | Y         | Infusion Infusion Infusion Infusion Oral Oral | Intestinal worms Abdominal pain | 0.26 |
|        |                               |            | Dudh-kandij | N         | Y         | Y         | N         | Paste Paste Paste Paste | Boils Blisters | 0.12 |
|        |                               |            | Jangli-tethwan | Y         | Y         | Y         | N         | Decoction Decoction Decoction Decoction Oral Oral | Abdominal pain Gas formation Indigestion Intestinal worms | 0.11 |
|        |                               |            | Pari-chaw   | N         | Y         | Y         | N         | Infusion Infusion Infusion Infusion Oral Oral | Inflammation Liver infection Fever | 0.14 |
|        |                               |            | Kumber      | Y         | N         | Y         | N         | Powder Powder Powder Powder | Eye pain Stomach Ulcer Cold Cough | 0.13 |
|        |                               |            | Kumber      | N         | N         | N         | Y         | Paste Paste Paste Paste | Blisters Cold Cold | 0.11 |
|        |                               |            | Hamesh-bahar | Y         | Y         | Y         | Y         | Paste Paste Paste Paste | Muscle pain Burns | 0.20 |
|        |                               |            | Ban-sario   | Y         | Y         | N         | N         | Decoction Decoction Oral Oral | Intestinal worms Indigestion | 0.09 |
Table 2. Cont.

| Family                  | Botanical Name/Voucher Number | Local Name | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Ailments Treated     | UV  |
|-------------------------|-------------------------------|------------|----------------------------------|-------|--------------|-------------|-------------|----------------------|-----|
| **Centaurea iberica**   | Trevir. ex Spreng 3381-KASH  | Krech      | Y N N Y H                         | LF    | Paste        | Topical     | Skin rashes Burns Wounds | 0.20|
| **Cichorium intybus**   | L. 2973-KASH                  | Kaw-hand   | N Y Y N H                         | WP    | Decoction    | Oral        | Diarrhea Body weakness Fever Joint pain Fractured bones | 0.22|
| **Cirsium arvense**     | (L.) Scop. 2974-KASH          | N Y Y N H  | LF                              | Paste | Topical      |            | Wounds Headache Joint pain                    | 0.12|
| **Conyza bonariensis** | (L.) Cronquist 3385-Shashedra | Shashedra  | N N Y Y H                         | WP    | Infusion     | Oral        | Painful menstruation Painful urination Kidney infection Anthelmintic | 0.14|
| **Conyza canadensis**   | (L.) Cronquist 2982-KASH      | Shal-lutt  | N N N Y H                         | LF    | Paste        | Oral        | Wounds Diarrhea Dysentery                               | 0.12|
| **Cosmos bipinnatus**   | Cav. 3386-KASH                 | Mazan-posh | Y N N Y H                         | FL    | Infusion     | Oral        | Jaundice Fever Headache                               | 0.08|
| **Cotula anthemoids**   | L. 3387-KASH                  | Thol-bobul | Y Y N N H                         | WP    | Decoction    | Topical     | Nasal congestion Joint pain Wounds Fractured bones     | 0.20|
| **Galinosoga parviflora** | Cav. 2983-KASH               | Machawagan-ghass | Y N N N H             | WP    | Poultice     | Topical     | Joint pain Cuts Wounds                                  | 0.14|
| **Lactuca saligna**     | L. 3406-KASH                  | Dodhkandiej| Y N Y Y H                         | WP    | Infusion     | Oral        | Joint pain Diarrhea Dysentery Abdominal pain             | 0.11|
| **Leucanthemum vulgare**| Lam. 2990-KASH                | -          | Y Y N Y H                         | LF    | Decoction    | Oral        | Cough Burns Wounds                                      | 0.17|
| Family          | Botanical Name/Voucher Number | Local Name  | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Ailments Treated                      | UV  |
|----------------|-------------------------------|-------------|----------------------------------|-------|-------------|-------------|------------|---------------------------------------|-----|
|                |                               |             | Gujar Bekerwal Pahadi Kashmiri    |       |             |             |            |                                       |     |
| **Ligularia fischeri** (Ledeb.) Turcz. 3622-KASH | Gomchwi         | Y           | Y                                 | N     | H           | Infusion    | Oral       | Jaundice Anti-inflammatory Arthritis Liver infection | 0.19 |
| **Myriactis nepalensis** Less. 3418-KASH         |                 | Y           | Y                                 | N     | H           | Paste       | Topical    | Wounds Chapped hands Cracked heels Cracked lips | 0.11 |
| **Saussurea costus** (Falc.) Lipsch. 3442-KASH    | Kuth            | Y           | Y                                 | N     | H           | Decoction   | Oral       | Asthma Bronchitis Cough Cold              | 0.23 |
| **Senecio chrysanthemoides** DC. 3443-KASH        | Bagghu          | Y           | N                                 | N     | Y           | Paste       | Topical    | Wounds Cuts Skin rashes                   | 0.09 |
| **Siga beckia orientalis** L. 3444-KASH           |                 | N           | N                                 | N     | Y           | Decoction   | Topical    | Joint pain Skin rashes Blister Swelling    | 0.14 |
| **Sonchus arvensis** L. 3003-KASH                 | Dudij           | N           | Y                                 | Y     | N           | Decoction   | Topical    | Skin rashes Wounds Blisters               | 0.09 |
| **Tagetus erecta** L. 3004-KASH                   | Guttaposh       | N           | Y                                 | Y     | Y           | Infusion    | Oral       | Urinary infection Colic infection         | 0.10 |
| **Tagetus minuta** L. 3453-KASH                   | Jalanijafar     | Y           | N                                 | Y     | Y           | Infusion    | Oral       | Blood purifier Dyspepsia Fever            | 0.09 |
| **Taraxacum officinale** F.H. Wigg. 3005-KASH     | Handh           | Y           | Y                                 | Y     | Y           | Cooked      | Oral       | Prolonged menstrual bleeding Weakness Dyspepsia | 0.20 |
| **Xanthium spinosum** L. 3461-KASH                | Lokut-cxeer     | N           | N                                 | Y     | N           | Decoction   | Oral       | Fever Headache Wounds                   | 0.11 |
| Family                  | Botanical Name/Voucher Number | Local Name | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Ailments Treated | UV   |
|------------------------|------------------------------|------------|----------------------------------|-------|--------------|-------------|-------------|------------------|------|
|                        |                              |            | Gujar                           | Bakerwal | Pahadi | Kashmir |             |                  |      |
|                        |                              |            | Y                               | Y       | N       | H       | Decoction | Topical | Boils            | 0.12 |
|                        |                              |            | FL                              | FL      | Decoction | Topical | Topical | Itching            |      |
|                        |                              |            |                  |         |          |          |           | Sun burns | Toothache       |      |
|                        |                              |            | WD                              | WP      | Paste    | Topical | Topical | Sun burns        | 0.08 |
|                        |                              |            |                  |         |          |          |           | Wounds          |      |
|                        |                              |            |                  |         |          |          |           | Skin allergy      |      |
|                        |                              |            |                  |         |          |          |           | Joint pain       |      |
|                        | Balsaminaceae                |            |                   |         |          |          |           | Topical         |      |
|                        | Impatiens glandulifera Royle 2989-KASH | Goj-gassh | N                  | N       | N       | Y       | Decoction | Oral | Tonic Snakebite | 0.29 |
|                        |                              |            |                  |         |          |          |           | Burns            |      |
|                        | Berberidaceae                |            |                   |         |          |          |           | Topical         |      |
|                        | Berberis lycium Royle 2970-KASH | Kawdach   | Y                  | N       | N       | Y       | Infusion | Oral | Toothache | 0.26 |
|                        |                              |            |                  |         |          |          |           | Oral | Diarrhea         |      |
|                        | Podophyllum hexandrum Royle 3429-KASH | Wanwangun | Y                  | Y       | Y       | Y       | Decoction | Oral | Diarrhea | 0.17 |
|                        |                              |            |                  |         |          |          |           | Oral | Body weakness   |      |
|                        | Brassicaceae                 |            |                   |         |          |          |           |                  |      |
|                        | Capsella bursa-pastoris (L.) Medik 2971-KASH | Kralmond  | N                  | N       | Y       | Y       | Infusion | Oral | Bleeding after delivery | 0.30 |
|                        |                              |            |                  |         |          |          |           | Oral | Vomiting         |      |
|                        |                              |            |                  |         |          |          |           | Intestinal infection |      |
|                        | Lepidium apetalum L. 3409-KASH | Kulhaakh  | N                  | N       | Y       | Y       | Decoction | Oral | Asthma | 0.28 |
|                        |                              |            |                  |         |          |          |           | Oral | Cough            |      |
|                        |                              |            |                  |         |          |          |           | Oral | Tonic Fever      |      |
|                        | Lepidium didymum L. 3410-KASH | Jangli-Halian | Y                | N       | N       | Y       | Decoction | Oral | Fracture | 0.21 |
|                        |                              |            |                  |         |          |          |           | Oral | Vomiting |          |
|                        |                              |            |                  |         |          |          |           | Topical | Rheumatism |      |
|                        | Nasturtium officinale W.T. Aiton 3419-KASH | Kulhaakh  | Y                  | Y       | N       | N       | Infusion | Oral | Indigestion | 0.14 |
|                        |                              |            |                  |         |          |          |           | Oral | Intestinal worms |      |
|                        |                              |            |                  |         |          |          |           | Oral | Constipation |      |
|                        | Sinapis alba L. 3448-KASH | Tilgogul gassh | N                | N       | N       | Y       | Infusion | Oral | Tonic | 0.13 |
|                        |                              |            |                  |         |          |          |           | Oral | Stomachache      |      |
|                        |                              |            |                  |         |          |          |           | Oral | Sore throat      |      |
|                        |                              |            |                  |         |          |          |           | Topical | Chest congestion |      |
| Family          | Botanical Name/Voucher Number | Local Name | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Aliments Treated | UV     |
|-----------------|-------------------------------|------------|----------------------------------|-------|--------------|-------------|-------------|-----------------|--------|
|                 |                               |            | Gujjar  | Bakerwal | Pahadi | Kashmiri |            |             |                 |        |
| **Cannabaceae** | *Cannabis sativa* L. 3376-KASH | Bhang      | Y       | Y        | N      | Y       | H           | LF             | Paste | Topical     | Joint pain | Ear-ache | Depression | Diarrhea | Intestinal worms | 0.19   |
|                 |                               |            |         |          |        |         |             | LF             | Paste | Topical     | Ear-ache | Diarrhea | Intestinal worms |        |
|                 | *Caprifoliaceae*              |            |         |          |        |         |             | LF             | Infusion | Oral       | Stomach pain | Indigestion | Diuretic | Diuretic | Diuretic | 0.14   |
|                 | *Sambucus wightiana* Wall. 3001-KASH | Gandula    | Y       | N        | N      | N       | H           | FR             | Infusion | Oral       | Stomach pain | Indigestion | Diuretic | Diuretic | Diuretic | 0.14   |
|                 | *Chenopodiaceae*              |            |         |          |        |         |             | LF             | Paste   | Oral       | Painful urination | Constipation | Laxative | Diuretic |        |
|                 | *Chenopodium album* L. 2972-KASH | Konh       | N       | N        | N      | N       | Y           | LF             | Cooked  | Oral       | Cold breath shortness | Cough | Indigestion |        |
|                 |                               |            |         |          |        |         |             | LF             | Infusion | Oral       | Indigestion |        |          |        |
|                 |                               |            |         |          |        |         |             | LF             | Infusion | Oral       | Indigestion |        |          |        |
|                 |                               |            |         |          |        |         |             | LF             | Infusion | Oral       | Indigestion |        |          |        |
|                 |                               |            |         |          |        |         |             | LF             | Infusion | Oral       | Indigestion |        |          |        |
|                 |                               |            |         |          |        |         |             | LF             | Infusion | Oral       | Indigestion |        |          |        |
| **Clusiaceae**  | *Hypericum perforatum* L. 2988-KASH | Shin-chae  | Y       | Y        | N      | N       | H           | LF             | Poultrice | Topical   | Joint pain | Wounds | Prolonged | Prolonged menstrual bleeding | 0.14     |
|                 |                               |            |         |          |        |         |             | FL             | Powder   | Topical   | Skin allergy | Fever | Healthy | Healthy |        |
| **Convolvulaceae** | *Cuscuta europaea* L. 2977-KASH | Kuklipot   | Y       | N        | N      | Y       | H           | WP             | Paste   | Topical   | Sunburn | Chest congestion | Breathing problems | 0.08     |
| **Ipomoea purpurea** (L.) Roth. 3617-KASH | Ishq-e-phechan | N       | N        | N      | Y       | C           | SD             | Infusion | Oral       | Anthelmintic | Diuretic | Laxative |        |
| **Cucurbitaceae** | *Cucumis sativus* L. 2976-KASH | Laer       | Y       | N        | Y      | Y       | C           | FR             | Paste   | Topical   | Skin cleanser | Fever | Healthy | Healthy |        |
| **Equisetaceae** | *Equisetum arvense* L. 2981-KASH | Bandakey   | Y       | N        | Y      | N       | H           | WP             | Paste   | Topical   | Skin allergy | Itching | Healthy | Healthy |        |
### Table 2. Cont.

| Family                      | Botanical Name/Voucher Number | Local Name       | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Ailments Treated                          | UV  |
|-----------------------------|-------------------------------|------------------|----------------------------------|-------|--------------|-------------|------------|------------------------------------------|-----|
|                            |                               | Gujar            | Bakerwal | Pahadi | Kashmiri | RT          | RT         | Decoction | Oral | Cold | Cough | Chronic bronchitis |
| Fabaceae                   | Astragalus grahamianus Berth. 3603-KASH | Zand posh       | N        | Y      | N       | N           | S          | Decoction | Oral | Oral | Morning sickness | Jaundice | Pneumonia | Chest congestion |
|                            | Medicago polymorpha L. 3625-KASH | Burahang         | N        | Y      | N       | Y           | H          | Infusion   | Oral | Oral | Fever | Muscle pain | Cuts |
|                            | Melilotus albus Medik. 3413-KASH | Janglimethi      | Y        | Y      | Y       | N           | H          | Infusion   | Oral | Oral | Topical | Fever | Cuts |
|                            | Robinia pseudoacacia L. 2998-KASH | Kikar            | Y        | N      | N       | N           | H          | Infusion   | Oral | Oral | Topical | Wounds | Joint pain | Fever | Chilblain |
|                            | Trifolium repens L. 3455-KASH | Batak neeg       | Y        | N      | N       | Y           | H          | Infusion   | Oral | Oral | Topical | Dry cough | Leucorrhoea | Gout |
|                            | Trigonella foenum-graecum L. 3456-KASH | Meth             | Y        | Y      | Y       | Y           | H          | Infusion   | Oral | Oral | Post-partum hemorrhage | Headache |
| Geraniaceae                | Erodium cicutarium (L.) L'Her.ex Aiton 3393-KASH | Painzungaj      | N        | N      | Y       | Y           | H          | Decoction | Oral | Oral | Indigestion | Sore throat |
|                            | Geranium pratense L. 2985-KASH | Ringrish         | Y        | N      | Y       | N           | H          | Infusion   | Oral | Oral | Toothache | Diarrhea | Dysentery |
|                            | Geranium wallichianum Oliv. 2986-KASH | Ratanjoth        | Y        | N      | Y       | N           | H          | Infusion   | Oral | Oral | Wound antiseptic | Fever | Joint pain |
| Hippocastanaceae           | Aesculus indica (Wall. eEx Jacqeuem) Hook. f. 3355-KASH | Handoon          | N        | N      | N       | Y           | T          | Infusion   | Oral | Oral | Joint pain | Cracked heals | Cough | Cold |
| Juglandaceae               | Juglans regia L. 3405-KASH | Doon             | Y        | N      | Y       | Y           | T          | Powder     | Topical | TPUtice | Topical | Wounds | Skin rashes |

**UV** stands for Ultraviolet radiation.
### Table 2. Cont.

| Family | Botanical Name/Voucher Number | Local Name | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Ailments Treated | UV |
|--------|-------------------------------|------------|----------------------------------|-------|--------------|-------------|-------------|------------------|----|
|        |                               |            | Gujar  Bakerwal  Pahadi  Kashmiri |       |              |             |             |                  |    |
|        | Lamiaceae                     |            |                                  |       |              |             |             |                  |    |
|        | *Ajuga bracteosa* Wall. ex Benth. 3356-KASH | Jani-adam | Y  Y  Y  N | H | WP | Infusion | Infusion | Oral | Abdominal pain  Diarrhea | 0.16 |
|        | *Ajuga parviflora* L. 3601-KASH | Jani-adam | Y  Y  Y  N | H | LF | Infusion | Infusion | Oral | Abdominal pain  Intestinal infection  Kidney infection | 0.23 |
|        | *Clinopodium umbrosum* (M.Bieb.) 3382-KASH | Kunakul | Y  N  Y  N | H | WP | Infusion | Cocked | Decoction | Topical | Astringent  Tonic  Carminative | 0.11 |
|        | *Isodon rugosus* Wall. ex Benth. 3404-KASH | Maldah | N  N  Y  Y | H | LF | Decoction | Paste | Powder | Oral | Abdominal pain  Insect bite  Seake bite | 0.17 |
|        | *Mentha aquatica* L. 3416-KASH | Kul pudni | Y  Y  Y  N | H | LF | Infusion | Infusion | Oral | Influenza  Abdominal cramps  Induces sweating | 0.14 |
|        | *Mentha arvensis* L. 3414-KASH | Pudni | Y  Y  Y  Y  Y | H | LF | Decoction | Decoction | Oral | Stomach cramps  Intestinal infection | 0.16 |
|        | *Nepeta cataria* L. 2993-KASH | Brair-gassh | Y  N  N  N  N | H | LF | Paste | Decoction | Topical | Oral | Headache  Fever | 0.19 |
|        | *Prunella vulgaris* L. 2997-KASH | Kalweuth | Y  Y  N  N  N | H | FR | Decoction | Paste | Paste | Topical | Joint pain  Headache  Muscle pain | 0.22 |
|        | *Stachys floccosa* Benth. 3645-KASH | Kalweuth | N  Y  Y  N  N | H | WP | Infusion | Infusion | Oral | Aminorhea  Diuretic | 0.21 |
|        | *Hibiscus syriacus* L. 3399-KASH | Jabakusam | N  Y  Y  N  S | S | FL | Decoction | Infusion | Infusion | Oral | Diuretic  White discharge  Body ache | 0.10 |
|        | *Lavatera cashmiriana* Mast. 3408-KASH | Saxposh | Y  N  Y  Y  Y | H | FL | Paste | Paste | Topical | Topical | Skin irritation  Skin infection | 0.22 |
|        | *Malva neglecta* Wall. 2991-KASH | Sochal | Y  Y  N  N  N | H | SD | Decoction | Cooked | Oral | Oral | Fever  Stomach cramps  Body weakness  Wounds | 0.19 |
| Family                | Botanical Name/Voucher Number | Local Name | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Ailments Treated | UV  |
|-----------------------|-------------------------------|------------|----------------------------------|-------|--------------|-------------|-------------|------------------|-----|
|                       |                               |            | Gujar | Bakerwal | Pahadi | Kashmiri |            |             |                  |     |
| Malva sylvestris L.   | 2992-KASH                     | Gur-sochal | Y     | Y        | N      | N        | H          | LF            | Paste            | 0.17|
|                       |                               |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
|                       | Moraceae                      |            |        |          |        |         |            |             |                  |     |
| Moraceae              |                               |            |        |          |        |         |            |             |                  |     |
| Ficus carica L.       | 3395-KASH                     | Arjeer     | N      | N        | N      | Y        | T          | FR            | Juice            | 0.20|
|                       |                               |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
|                       | Ficus palmata Forssk.         | Arjeer     | Y      | Y        | N      | Y        | T          | LF            | Juice            | 0.19|
|                       |                               |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
| Osallidaceae          | Oxalis corniculata L.         | Chuk-xanij | N      | N        | N      | Y        | H          | WP Paste       | Infusion          | 0.25|
|                       |                               |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
| Pinaceae              | Abies pindrow (Royle ex D. Don) | Budul     | Y      | Y        | N      | N        | T          | LF Paste       | Infusion          | 0.16|
|                       | (Royle ex D. Don) Royle       |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
| Pinaceae              | Cedrus deodara (Roxb. ex D. Don) | Deodar   | Y      | Y        | Y      | N        | T          | WD Paste       | Infusion          | 0.22|
|                       | (Roxb. ex D. Don) G. Don.     |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
| Poaceae               | Pinus wallichiana A. B. Jacks. | Kayar     | Y      | Y        | Y      | N        | T          | ST Paste       | Infusion          | 0.17|
|                       | 2994-KASH                     |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
| Plantaginaceae        | Plantago lanceolata L.        | Gull       | Y      | N        | Y      | Y        | H          | LF Paste       | Infusion          | 0.22|
|                       | 2995-KASH                     |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
| Plantaginaceae        | Plantago major L.             | Bed-Gull   | N      | N        | N      | Y        | H          | LF Paste       | Infusion          | 0.20|
|                       | 2996-KASH                     |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
| Poaceae               | Cynodon dactylon (L.) Pers.   | Dramun     | Y      | Y        | Y      | N        | H          | WP Paste       | Infusion          | 0.11|
|                       | 2979-KASH                     |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
| Poaceae               | Echinocula colona (L.) Link   | Hamgass    | N      | N        | N      | Y        | H          | WP Powder      | Infusion Topical  | 0.09|
|                       | 3391-KASH                     |            | Uses   | recorded | across  | the   |            |             | cultures        |     |
| Family            | Botanical Name/Voucher Number | Local Name | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Ailments Treated | UV |
|-------------------|-------------------------------|------------|----------------------------------|-------|--------------|-------------|-------------|------------------|----|
| *Poa pratensis* L. 3632-KASH | Gass | Y | N | Y | N | H | SD | Cooked Powder | Oral | Topical | Tonic | Wound healing | 0.10 |
| *Bistorta amplexicaulis* (D.Don) Greene 3424-KASH | Marhan-chai | Y | Y | Y | N | H | RT | Paste Infusion Infusion Powder | Topical | Topical | Headache | Burns | 0.18 |
| *Polygonum ariculare* L. 3430-KASH | Bamalia | Y | N | Y | N | H | LF | Infusion Infusion Powder | Oral | Oral | Topical | 0.16 |
| *Rumex nepalensis* Spreng. 2999-KASH | Abij | Y | Y | Y | N | H | RT | Juice Juice Powder | Topical | Topical | Headache | Cuts | 0.19 |
| *Adiantum capillus-veneris* L. 3354-KASH | Gewtheer | Y | Y | N | N | H | LF | Paste Paste Paste | Topical | Chest congestion | 0.20 |
| *Cyndonia oblonga* Mill. 2978-KASH | Bumchoont | Y | Y | Y | N | T | SD | Decoction Juice Juice | Oral | Constipation | 0.16 |
| *Geum regale* Wall. ex. F. Bolle 2997-KASH | Y | N | Y | N | H | WP | Paste Paste Paste | Topical | Nasal congestion | 0.09 |
| *Rosa indica* L. | Gulab | Y | Y | Y | Y | H | FL | Juice Juice Powder Powder | Oral | 0.21 |
| *Galium aparine* L. 2984-KASH | Thapeh-gashh | Y | N | Y | N | H | LF | Paste Paste Paste | Topical | Wound antisepic | 0.11 |
| *Salix alba* L. 3000-KASH | Veer | Y | N | N | Y | T | LF | Decoction Infusion Infusion | Oral | Joint pain | 0.14 |
### Table 2. Cont.

| Family          | Botanical Name/Voucher Number | Local Name | Use Recorded across the Cultures | Habit | Part(s) used | Preparation | Application | Ailments Treated | UV  |
|-----------------|-----------------------------|------------|----------------------------------|-------|--------------|-------------|-------------|------------------|-----|
| Scrophulariaceae| Verbascum thapsus L. 3458-KASH | Wantamook  | Gujar                           | N     | LF           | Paste       | Topical     | Ear pus           | 0.17|
|                 |                             |            | Bakerwal                        | N     | LF           | Paste       | Topical     | Burns            |     |
|                 |                             |            | Pahadi                          | N     | H            |             |             |                  |     |
|                 |                             |            | Kashmiri                        | N     |             |             |             |                  |     |
|                 |                             |            | Use                               |       | Paste        |             |             |                  |     |
|                 |                             |            | Recorded across the Cultures     |       | Powder       |             |             |                  |     |
|                 |                             |            | Habit                            |       | Paste        |             |             |                  |     |
|                 |                             |            | Part(s) used                      |       | Paste        |             |             |                  |     |
| Solanaceae      | Datura stramonium L. 2980-KASH | Datur      | Y                                | N     | SD           | Powder      | Oral        | Arthritic pain    | 0.20|
|                 |                             |            | N                                | Y     | LF           | Paste       | Oral        | Cough             |     |
|                 |                             |            | N                                | H     | LF           | Paste       | Oral        | Burns            |     |
|                 |                             |            | Use                               |       |             |             |             |                  |     |
|                 | Solanum nigrum L. 3002-KASH | Kambai     | N                                | N     | FR           | Paste       | Topical     | Skin rashes       | 0.17|
|                 |                             |            | Y                                | Y     | FR           | Paste       | Topical     | Cold             |     |
|                 |                             |            | H                                |       | FR           | Paste       | Topical     | Cough            |     |
|                 |                             |            | Use                               |       | Paste        |             |             |                  |     |
|                 | Solanum tuberosum L. 3451-KASH | Altaa     | N                                | N     | TB           | Cooked      | Oral        | Acidity           | 0.11|
|                 |                             |            | N                                | N     | TB           | Paste       | Oral        | Blisters          |     |
|                 |                             |            | Y                                | H     | TB           | Paste       | Oral        | Wounds            |     |
| Urticaceae      | Urtica dioica L. 3006-KASH | Soi        | N                                | N     | LF           | Paste       | Topical     | Skin infections   | 0.12|
|                 |                             |            | Y                                | Y     | LF           | Paste       | Topical     | Joint pain        |     |
|                 |                             |            | Y                                |       | RT           | Paste       | Topical     |                  |     |
| Violaceae       | Viola odorata L. 3007-KASH | Palfort    | Y                                | Y     | FL           | Infusion    | Oral        | Sore throat       | 0.14|
|                 |                             |            | Y                                | Y     | FL           | Paste       | Oral        | Chest congestion  |     |
|                 |                             |            | H                                |       | FL           | Infusion    | Oral        | Bronchitis        |     |
|                 |                             |            | Use                               |       |             |             |             | Cough             |     |
| Vitaceae        | Vitis vinifera L. 3008-KASH | Daech      | Y                                | N     | LF           | Poultice    | Oral        | Sores             | 0.16|
|                 |                             |            | Y                                | Y     | FR           | Juice       | Oral        | Fever             |     |
|                 |                             |            | Y                                |       | FR           | Juice       | Oral        | Jaundice          |     |
|                 |                             |            | Use                               |       |             |             |             | Body weakness     |     |

**Abbreviations:** LF—leaf; RT—root; RH—rhizome; FL—flower; SD—seed; FR—fruit; WP—whole plant; TB—tuber; WD—wood; BR—bark; ST—stem; H—herb; S—shrub; T—tree; C—climber; Y—yes; N—no.
3.2. Plant Part(s) Used, Mode of Preparation, and Administration

As far as the utilization of plant parts for the preparation of herbal remedies is concerned, leaves (38%) were the most commonly used plant part, followed by the whole plant (19%), flower (12%), root (10%), fruit (7%), seed (5%), stem (2%), bark, wood, rhizome, tuber and aerial portions (1% each), as shown in Figure 4. Leaves are often used by communities all over the world [41-43]. The reason behind this may be that leaves are easy to collect compared to the rest of the plant parts [44] and because, as photosynthetically active parts, the leaves often contain more secondary metabolites [45]. In addition, the difference in plant part consumption could be due to differences in species variety [12]. Most of the remedies were prepared as a paste (33%), followed by decoction and infusion (23% each), cooked and as juice (5%), poultice and powder (4% each), oil (2%), and tea (1%) (Figure 5). The frequent use of decoctions could be due to the perceived high effectiveness in the treatment of a number of diseases or because aqueous extracts are often less toxic than preparations with other extraction methods [46]. Pastes are also commonly used around the globe [39,47]. Most of the herbal remedies were made from a single plant species (monotherapy) rather than by mixing more than one plant species or plant part. Herbal remedies were mostly prepared using fresh plants. These results are in line with other reports from other regions of the world [48,49].

![Figure 4. Percentage contribution of plant part used.](image)

![Figure 5. Percentage contribution of herbal remedies.](image)
It was found that medicinal plant remedies were administered through oral and topical means by the local population of the region. Topical consumption (52%) was the most commonly used route of administration, followed by oral consumption (48%). The prevalence of topical application is in line with other studies [50,51]. Topical use is considered the most accepted way for the treatment of diseases such as skin disorders, joint pains, wounds, muscular pains, headaches, etc. [52], while oral use is considered ideal for treating internal disorders [52,53]. However, there is a potential difference in the number of doses given to treat a particular disorder.

3.3. Cross-Cultural Analysis

A greater similarity (14% species) in the usage of plants was shown by the Bakerwal, Gujjar, and Pahadi ethnic groups, whereas the least similarity (1%) was observed between the Bakerwal and Kashmiri (Figure 6a). The Venn diagram (Figure 6a) shows that fifteen species (14%) were uniquely used by the Kashmiri, while the Bakerwal reported the lowest number of one species (1%). A cross-cultural comparison of plant resources showed that 7% of plants overlapped between the four groups of the study area. The highest number of uniquely used species was used by the Kashmiri community ($n = 15$) in comparison to the Gujjar ($n = 5$), Bakerwal ($n = 1$), and Pahadi ($n = 2$) groups (Figure 6b). The striking diversity in plant use may be attributed to the varied historical stratifications of the investigated groups as well as to distinct sociocultural adaptations and interactions between humans and their environments. These kinds of close similarities in how different tribes use particular plants could be explained by the fact that some of them have engaged in sociocultural agreements with others. For instance, the intermarriage of and similarities in religions, locations, and easy accessibility that the Bakerwal, Gujjar, and Pahadi cultures share; in contrast, the Bakerwal and Kashmiri cultures are distinct from each other, so they exhibit little relationship. The dissemination of ethnobotanical knowledge among them has been influenced as a result. It is also important to note that the fact that there are so many use discrepancies could be related to the fact that the ethnic groups live in such diverse geographic areas. The Pahari and Kashmiri people reside in the middle to upper altitudes, whereas the Bakarwal and Gujjar people inhabit higher elevations. The Bakerwals’ use of mobile pastoralism, which has led to new plant knowledge, is also significant. Haq et al. [16] from the Ladakh region and Aziz et al. [54] from the Pakistan Himalayas conducted a similar cross-cultural analysis and concluded that ethnicity and cultural practices have shaped traditional herbal knowledge among the local inhabitants. Abidin et al. [55] from southwest Pakistan revealed similar findings, which confirm our findings from the Kashmir Himalayan region.

Figure 6. (a) Venn diagram showing the overlap of ethnomedicinal usage of plants. (b) Plant species uniquely used by different ethnic groups.
Examining the usage of medicinal plants, all four groups were found to commonly use *Taraxacum officinale* (Handh), *Amaranthus caudatus* (Liss), *Trigonella foenum-graceum* (Meth), *Mentha arvensis* (Pudni), *Cynodon dactylon* (Dramun), *Podophyllum hexandrum* (Wanwangun), *Rosa indica* (Gulab), and *Viola odorata* (Palfort). This overlap might be because these plants are commonly available in the lower as well as higher reaches of the study area or because the informants of all the groups are aware of the medicinal properties of these plants.

In comparison to other groups, *Astragalus grahamianus* (Zand posh) was found to be used only by the Bakerwal tribes. The reason behind this might be that this plant is collected from the upper reaches, along the roadsides, and the same route is used by the Bakerwal tribes for migrating to other places as they are nomadic pastoralists.

Leaves of *Taraxacum officinale* (Handh) are cooked and eaten to treat prolonged menstrual bleeding, weakness, and dyspepsia by all four investigated tribes. Similar results have been reported by Jan et al. [12]. *Daucus carota* (Gazer) is uniquely used by the Kashmiri community. It is due to the presence of the said plant at lower altitudes, where only the Kashmiri people reside. Rhizome infusions of *Acorus calamus* (Vai-gander) are used by the Gujar and Kashmiri communities as an antispasmodic and an anthelmintic and for the treatment of acidity. Meanwhile, the leaf and flower parts of *Ligularia fischeri* (Gomchwi) are used by Gujar, Bakerwal, and Pahadi communities but not by Kashmiri. The reason behind this may be the cultural similarities between the three aforementioned groups. Similarly, *Saussurea costus* (Kuth) is also used by Gujar, Bakerwal, and Pahadi ethnic groups. This plant grows commonly in higher reaches, and the Kashmiri communities do not live or hardly live in the upper reaches of the region. This may be the reason behind the use of *Saussurea costus* by only three communities out of the four. *Saussurea costus* is considered a well-known medicinal plant and is commonly utilized for the treatment of many diseases such as asthma, ulcers, inflammatory disorders, stomach problems, and many more [56].

### 3.4. Use Value (UV)

For the evaluation of the local importance of any plant, UV was proposed by Phillips and Gentry [28]. It is not true that medicinal plants with low use values are less important, but it indicates that the knowledge of these medicinal plants is at risk or that there is less availability of the particular medicinal plant [57]. The high UV of medicinal plants in the study region is attributed to their common distribution in the area, and the local people are very familiar with their medicinal uses [58]. The higher the use value, the higher the importance of the particular plant species. However, one cannot distinguish based on UV alone whether a plant is used for single or multiple ailments [59]. In this study, UVs ranged from 0.08 to 0.30, in which the highest value was reported for *Capsella bursa-pastoris* (0.30), followed by *Artemisia absinthium* and *Berberis lycium* (0.26), *Oxalis corniculata* (0.25), and *Juglans regia* and *Saussurea costus* (0.23) (Table 2). Jaradat et al. (2017) also reported *Capsella bursa-pastoris* among the high UV medicinal plants. Bhatia et al. [29] reported *Foeniculum vulgare* among high UV medicinal plants in their study. The lowest UV of 0.08 was recorded for *Amaranthus caudatus*, *Cosmos bipinatus*, *cucuta europea*, and *Impatiens glandulifera*, in contrast to the result reported by Jardat et al. [60].

Meanwhile, *C. bursa-pastoris* has traditionally been used as a medicinal herb to treat vomiting, hemorrhage, conjunctivitis, and hydropsy [61]. Different plant parts of *C. bursa-pastoris* have reportedly been found to contain a variety of biological activities, including those that are anti-tumor [62], anti-inflammatory [63], anti-oxidant [64], anti-microbial [65], and anti-hypertensive [66]. In previous phytochemical studies of *C. bursa-pastoris*, amino acids [67,68], flavonoids [69], alkaloids [70], and essential oils [71,72] were all shown to be present.

### 4. Conclusions

In the present study, it was found that the study area has a rich diversity of medicinally important plant species capable of treating a wide variety of human ailments. It can be concluded from this study that people of the study area possess rich traditional knowledge
inherited from their forefathers and that the documentation of this valuable knowledge has provided novel information on the area. Native populations still rely on medicinal plants for their primary health care but, at the same time, are alarmed about the degradation of flora in the wild. It was found that the elderly people possessed a great wealth of indigenous knowledge in comparison to younger ones; this difference in knowledge might be due to the changing lifestyle of the younger generation, the changing views of ethnic communities, and the increasing influence of industrialization, due to which the traditional medicinal knowledge of plant species is vanishing at an alarming rate. Therefore, there is a need to speedily document the important plants and associated knowledge and to take necessary measures for the conservation of these resources to save these treasures; otherwise, a great number of medicinally important plants will become extinct in the wild. To validate this indigenous knowledge, we suggest future phytochemical and pharmacological investigation as these plants may serve for the discovery of new potential drugs.

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**Institutional Review Board Statement:** This ethnomedicinal study was approved by the ethical committees of the Department of Botany, Government Model Science College, Jiwaji University, Gwalior, India. Before conducting interviews, individual prior-informed consent was obtained from all participants. No further ethics approval is required. All work conducted was carried out under the stipulations of the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization of the Convention on Biological Diversity. The right to use and authorship of any traditional knowledge of all participants is maintained, and any use of this information, other than for scientific publication, requires the additional prior consent of the traditional owners as well as a consensus on access to benefits resulting from subsequent use.

**Informed Consent Statement:** Before conducting interviews, individual prior-informed oral consent was obtained from all participants.

**Data Availability Statement:** The data used to support the findings of this study are available from the corresponding author upon request.

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**Abbreviations**

- WHO—World Health Organization; IPNI—International Plant Names Index; KASH—Herbarium acronym; UV—use value; LF—leaf; RT—root; RH—rhizome; FL—flower; SD—seed; FR—fruit; WP—whole plant; TB—tuber; WD—wood; BR—bark; ST—stem; H—herb; S—shrub; T—tree; C—climber; Y—yes; N—no.

**Appendix A Questionnaire**

- Name of the participant.
- Participant’s age and gender.
- Address of the participant.
- Educational qualification of the participant.
- Interview date.
- How long do you live in the given area?
- Local name of the used plant.
Which diseases are treated by the plant?
Which part is used?
What is the method of remedy preparation?
What is the approximate dose?
How long should a patient be using the plant?
Are there any possible side effects when one uses of the plant, or specific groups (e.g., children, pregnant women) who have to be careful or should not use it?

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