

TRADITIONAL KNOWLEDGE OF MEDICINAL FLORA OF DANDI KOT
VALLEY DISTRICT BUNERHashma^{1*}, Hussan Ara Begum¹, Sayeda sidra¹, Hafsa Majeed¹¹Department of Botany, Abdul Wali Khan University Mardan, 23200 KP, Pakistan[Correspondence: Hashma*](#)

Abstract

We have conducted an ethnobotanical and quantitative study of wild medicinal plants. We selected a rural area, the Dandi Kot Valley, Buner District, KP Pakistan, for our research. This was first quantitative study in this area. We collected information from 75 informants through open-ended, semi structured interview. Ethnomedicine importance and benefits were expressed through different quantitative indices including Use Value (UV), Frequency of Citation (FC), Relative Frequency of Citation (RFC). Medicinal plants with the highest Use Value were *Mentha longifolia* (Linn) Huds. with 0.84 used value, *Justicia adhatoda* L. (0.81), *Zizyphus jujube* Mill. (0.7). The least used species was *Boerhavia diffusa* L. (0.14) and *Conyza canadensis* (L.) Cronquist (0.15). The highest RFC was recorded for *Justicia adhatoda* L., *Mentha longifolia* (Linn) Huds., (0.8 each). This study includes 28 plant species from 21 families. People of this area depend on medicinal plants for the treatment of different diseases such as dysentery, diarrhea, stomach, and liver problems. The leaves were the most utilized plant part of ethnomedicine (47.05%), Asteraceae was the leading family with 3 plant species. In this valley medicinal plants are used for different diseases which is an addition to the generally rich ethnomedical practices.

Key words: Dandi kot, medicinal plants, extinction, Buner Khyber Pakhtunkhwa.

1. Introduction

The study of the relationship between plants and humans is called ethnobotany: from "Ethno" - the study of people "Botany" - the study of plants. Ethnobotany is the uses of plants in human society for food, medicinal purposes, architecture, tools, money, clothing, ceremonies, and harmony (Choudhary *et al.*, 2008). The study of plant use in civilization is ethnobotany and is a different research area (Selin *et al.*, 2013). According to an estimated 80% of the population in developing countries relies on traditional medicines (Umair *et al.*, 2017). Traditional medicines are currently in a reputable position, especially in developing countries where modern healthcare facilities are inadequate. Harmless, genuine, and conscious ethnic medicine is gaining acceptance in urban and rural areas (Abbasi *et al.*, 2013). The certification of traditional information on native plant species has contributed to several vital medicines. Current pharmacopeia includes 25% of herbal medicines and several synthetic medicines. It has been reported that natural products play an essential role in the development of new drugs (Mahmood *et al.*, 2011; Fabricant *et al.*, 2001). More recently, the increased attention of researchers to ethnomedicines is due to the importance of medicinal plants for daily healthcare (Pei *et al.*, 1995; Balée *et al.*, 1989). Different researchers have worked in different areas of Pakistan to identify medicinal plants and indigenous knowledge. The ethnobotanical studies focused on future purposes and also on contributing to knowledge about the biological diversity of plants (taking into account biological diversity and human awareness about the use, application, and conservation of natural resources). The roots of *Justicia adhatoda* are used for ailments such as joints inflammations, lung infections, cures antiseptics, expectorants, anticonvulsants, and demulsifiers (Ahmad *et al.*, 2011; Rahman *et al.*, 2016; Balick *et al.*, 1996). *Silybum marianum* (L.) Gaertn. Use to treat liver diseases (Post-White *et al.*, 2007; Abenavoli *et al.*, 2010). Barriers are recommended for bacterial infection (leprosy), enlarged spleen, and liver due to heart disease. *Rumex hastatus* leaves are used as a diuretic. In (Jan *et al.*, 2017), authors have examined ethnobotanical plants from the Chinglai Buner Valley, KP Pakistan, with 80 plant species from 46 families of shrubs and herbs in which they reported that *Rumex dentatus* L. is an antiseptic for wounds and skin problems. It was also analyzed that these medicinal plants are used in various diseases. (Shinwari *et al.*, 2002, May) came to the conclusion that the leaves of *Datura innoxia* are effective against toothache, headache, and epilepsy and that its seeds have an antipyretic and narcotic effect. *Datura innoxia* is used as a soothing agent. (Chopra *et al.*, 1986) reported *Indigofera hirsute* L. used to treat stomach, liver, kidney and pulmonary disorders and *Cleome viscosa* L. is used for cough relief. It is reported that *Rumex hastatus* is used to treat stomach and digestive disorders. (Lorenzi *et al.*, 1982; Bastos *et al.*, 2006) Reported that *Physalis angulate* L. used to treat autoimmune disorders. (Iwu *et al.*, 2014; Ibrahim *et al.*, 2010) reported that *Commelina benghalensis* L. to treat stomach disorders and used as purgative. The information check on medicinal plants is an essential aspect of the maintenance methods. Most medicinal plants have almost disappeared due to their use for fuel and grazing. For our study, we have investigated the medicinal plants found in the Chamla valley of Buner, Khyber Pakhtunkhwa. The inhabitants of this area are mainly related to agriculture that raises livestock and their products. Without awareness, people face many problems related to seasonal diseases. Sanitation facilities are unusual, especially in tehsil Khudukhel. Therefore, this study records the traditional knowledge of the local community in the Buner district about the medicinal value and diversity of plants.

This work is the first collection and commercialization of therapeutic plants in this area, providing the initial ethnic-medicinal and traditional evaluation (Qureshi *et al.*, 2006; Burkill *et al.*, 1985).

The aim of this work is:

- (1) To register the therapeutic flora and cultural information of the resident community about native plants used for therapeutic purposes
- (2) To identify and provide quick, harmless, and low-cost healing plants.

2. Material and Methods

The Dandi kot valley is located in khudukhel tehsil of district Buner, Khyber Pakhtunkhwa Pakistan. The samples of medicinal plants were preserved and dried after proper methods of identification and collection. The presence of plants increases the beauty of Dandi kot valley. The duration of the ethnobotanical study was between January 2018 and September 2019. Plants were identified by the help of Pakistan flora and available literature and submitted to the herbarium of Abdul Wali khan. The identification process was done with the help of local people which facilitate the process of categorization and uses of medicinal plants. Local aged people were the main focus of the interview process. The real users of medicinal plants also include formers, wood sellers, local traders, and the herbalists of the attached areas. This study increased awareness and people were interested in identifying the medicinal use of plants. According to proper procedures and rules of plant collection, we collected plants using newspapers, bags, mercury chloride, papers, notebook, cutters, scissors, labels, gloves, and ethanol.

3. Data analysis

We have listed medicinal plants in Table 1 along with their uses for diseases, scientific and local names, part used. Semi-structured interviews and questionnaires were carried out to collect data. The data acquisition and analysis took place with MS-Excel from MS Office 2016.

Quantitative ethnobotany

To calculate different statistical values on which our data is based, we used the presented formulations.

Frequency of citation (CF)

The frequency of citations and relevant frequency of citations are calculated as follows,

$FC = (\text{the number of times a particular species was mentioned}) / (\text{total number of mentions of all species}) \times 100.$

The RFC index is used to indicate the local meaning of each type. It was scored by dividing the number of informants who mentioned species. It is calculated as FC divided by the total number of informants who participated in the survey (N). The RFC index varies from zero when no one describes a plant as useful, and value one when all informants have described a plant as useful (Fabricant *et al.*, 2001).

$$\text{RFC} = \text{FC} / \text{N}.$$

4.2 Use value (UV)

UV is calculated using the following formula:

$$\text{UV} = \text{U}_i / \text{N}_i,$$

Where "U_i" refers to the number of uses by informants (i) for a particular species, and "N_i" is the total number of informants interviewed for a particular plant. When a plant has high UV, there are many useful reports for that plant, while a low score indicates fewer reports of use mentioned by informants (Chopra *et al.*, 1986; Lorenzi *et al.*, 1982).

4. Results and discussion

We selected Dandi kot valley of tehsil khudu khel, for an ethnobotanical study in which 28 plant species from 21 families from the site were recorded. Results show that *Asteraceae* was the leading family with 3 plant species, followed by *Fabaceae*, *Nyctaginaceae*, *Euphorbiaceae*, and *Solanaceae* with two plant species. While the other families had a single species contribution (Fig. 1). The flora habit is consists of 86.96% herbs, 17.24% shrubs, and 13.79% tree (Fig. 2). The plant part used by the local community is :16 leaves, followed by 7 roots, 4 seeds and whole plant, 3 fruits and flowers, 1 spike and resin (Fig 3).We interviewed random people with considerable knowledge of medicinal plants and collected important data during field-study. We have listed medicinal plants in Table 1 and 2 along with their uses for diseases, scientific and local names, part used, and U_i, N_i, U_V_i, FC, and RFC.

4.1 Quantitative ethnobotany

4.1.1. Use Value (UV)

In this study, the UV of the plants in table 2 was between 0.14 to 0.84. Most commonly used medicinal plants were *Mentha longifolia* (Linn) Huds. with 0.84 used value, *Justicia adhatoda* L. (0.81), *Zizyphus jujube* Mill. (0.7). Medicinal plants with low UV were *Boerhavia diffusa* L. (0.14), *Conyza canadensis* (L.) Cronquist (0.15), *Achyranthes aspera* L. (0.17). Plants with highest UV were used for bronchitis, diarrhea, and dysentery as expectorant, abortifacient. Plants with low UV were used for boils, as blood cleanser.

4.2 Relative frequency of citation (RFC)

In this study, RFC value ranged from 0.08 to 0.8. plants with highest RFC value were *Justicia adhatoda* L., *Mentha longifolia* (Linn) Huds., (0.8 each), *Dodonea viscosa* (L.) Jacq. (0.66), *Zizyphus jujube* Mill. (0.65). Medicinal plants with lowest RFC value were *Martynia annua* L.(0.06), *Achyranthes aspera* L. (0.08), *Conyza canadensis* (L.) Cronquist(0.09).Plants with highest citation frequency (FC) were *Justicia adhatoda* L., *Mentha longifolia* (Linn) Huds. (FC-60 each)

5. Conclusion

The survey carried out in this paper will stimulate interest in the protection and conservation of medicinally essential plants in the village of Dandikot, Buner district. It is observed that pansaries (sellers of local medicinal plants), herbalists (hakims), are slow and unwilling to prescribe medical information to the native people. The current study in Dandi kot valley has shown that people use medicinal plants for sicknesses such as diarrhea, diabetes, fever, breathing disease. Our results provide useful information, which will help the local people of Dandi kot to conserve their medicinal flora and continue the wise use of medicinal plants like other developing countries. It is recommended that tests (biochemical tests) can be developed to study plants and to improve certain drugs using chromatographic practices—improvement of protection approaches for the maintenance of the flora of medicinal importance in Dandi kot valley is needed.

Table.1 Medicinal plants of Dandi kot, district Buner, KP

S.no	Scientific name	Local name	Family	Habit	Plant Part use	Ethnobotanical use
1.	<i>Adiantum capillus-veneris</i>	Sunmbal	<i>Adiantaceae</i>	Herb	Whole plant	as shampoo, antitoxin, purgative
2.	<i>Achyranthes aspera L.</i>	Spe buty	<i>Amaranthaceae</i>	Herb	Leaves	Used as blood cleanser
3.	<i>Alysicarpus vaginalis (L.) DC.</i>	Skha bote	<i>Fabaceae</i>	Herb	Whole plant	Used for bone fractures, roots used to treat cough
4.	<i>Acacia modesta Wall.</i>	Palusa	<i>Mimosaceae</i>	Tree	Resin	For impotence as it is a tonic, stimulant.
5.	<i>Boerhavia diffusa L.</i>	Ensut	<i>Nyctaginaceae</i>	Herb	Roots	Used outwardly for boils.

6.	<i>Butea monosperma</i> (Lam.) Taub	Palay	<i>Papilionaceae</i>	Tree	Seeds and flowers	used as helminthic, anti- jaundice and also used on sore areas of skin
7.	<i>Cleome viscosa</i> L.	Malkhoze	<i>Cleomaceae</i>	Herb	Leaves, seeds	Used to treat diarrhea, dysentery, relief pain
8.	<i>Cuscuta reflexa</i> roxb.	Paaprha	<i>Cuscutaceae</i>	Herb	Shoot	To prevent fertility and for skin problems, back pain, control urinary incontinence
9.	<i>Commelina benghalensis</i> L.	Narha narhi	<i>Commelinaceae</i>	Herb	Flower, leaves, root	Used as constricting, treat diarrhea, and leprosy
10.	<i>Conyza canadensis</i> (L.) Cronquist	Skhaboty	<i>Asteraceae</i>	Herb	Whole plant	Used as a cooling agent
11.	<i>Datura innoxia</i> Mill.	Daltora	<i>Solanaceae</i>	Herb	Leaves, seeds	Used as antipyretic and narcotic, poisonous
12.	<i>Dodonea viscosa</i> (L.) Jacq.	Ghorhaske	<i>Sapindaceae</i>	Shrub	Leaves	Insect repellent and also used as an antipruritic
13.	<i>Eryngium campestre</i> L.	Spe boty	<i>Asteraceae</i>	Herb	Roots, shoots	As expectorant, stimulant and for cough relief
14.	<i>Euphorbia heliscopia</i> Linn.	Mandano	<i>Euphorbiaceae</i>	Herb	Seeds and latex	As laxative. Latex for skin diseases
15.	<i>Indigofera hirsute</i> L.	Skhabote	<i>Fabaceae</i>	Herb	Leaves, roots	Used for stomach problems, relief pain, and for liver problems
16.	<i>Justicia adhatoda</i> L.	Bekarh	<i>Acanthaceae</i>	Shrub	Leaves and roots	as an antispasmodic, expectorant, abortifacient.
17.	<i>Mirabilis jalapa</i> Linn.	Guli nazak	<i>Nyctaginaceae</i>	Shrub	Leaves and roots	For cure of abscesses and also used as pain relievers and treat typhoid fever.

18.	<i>Melochia corchorifolia L.</i>	Skhabote	<i>Malvaceae</i>	Herb	Leaves	Used for abdominal problems, dysentery, and urinary track Infections
19.	<i>Martynia annua L.</i>	Skhabote	<i>Martyniaceae</i>	Herb	Leaves, fruit, roots	Used for skin and throat infections
20.	<i>Mentha longifolia (Linn) Huds.</i>	Velany	<i>Lamiaceae</i>	Herb	Leaves	as an antispasmodic, carminative, decreases acidity
21.	<i>Physalis angulate L.</i>	Skhabote	<i>Solanaceae</i>	Herb	Leaves, fruit	Used for stomach problems,
22.	<i>Rumex dentatus L.</i>	Shalkhe	<i>Polygonaceae</i>	Herb	Leaves	As an astringent, to relieve allergies and irritations.
23.	<i>Ricinus communis L.</i>	Arandha	<i>Euphorbiaceae</i>	Tree	Leaves	as a purgative to cure bloating and constipation, and also as an antidote for poisoning and also used to relieve coughs, fever, and headaches.
24.	<i>Silybum marianum (L.) Gaertn.</i>	Wrujake	<i>Asteraceae</i>	Herb	Flowers	treating tuberculosis and jaundice
25.	<i>Urtica dioica Linn.</i>	Sezonke	<i>Urticaceae</i>	Herb	Whole plant	as a coolant and for icterus
26.	<i>Zanthoxylum armatum DC.</i>	Dambra	<i>Rutaceae</i>	Shrub	Fruits	to cure stomach ailments such and also used as spices
27.	<i>Zizyphus numularia (Burm.f.) Wight &Am.</i>	Bera	<i>Rhamnaceae</i>	Shrub	Leaves	used in scabies and boils
28.	<i>Zizyphus jujube Mill.</i>	Bera	<i>Rhamnaceae</i>	Tree	Leaves	Used as fodder, fuel, hair wash, for bronchitis, diarrhea, and dysentery

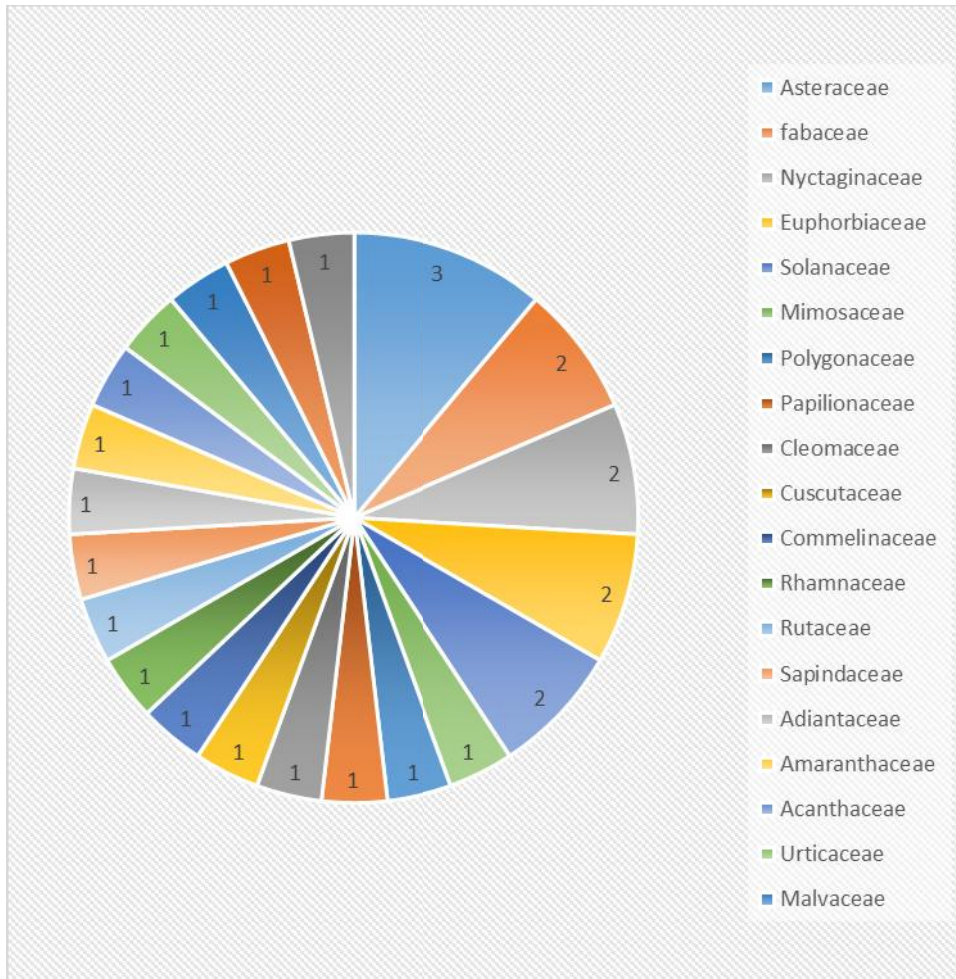


Fig .1 Medicinal plants families distribution in study area Dandi kot

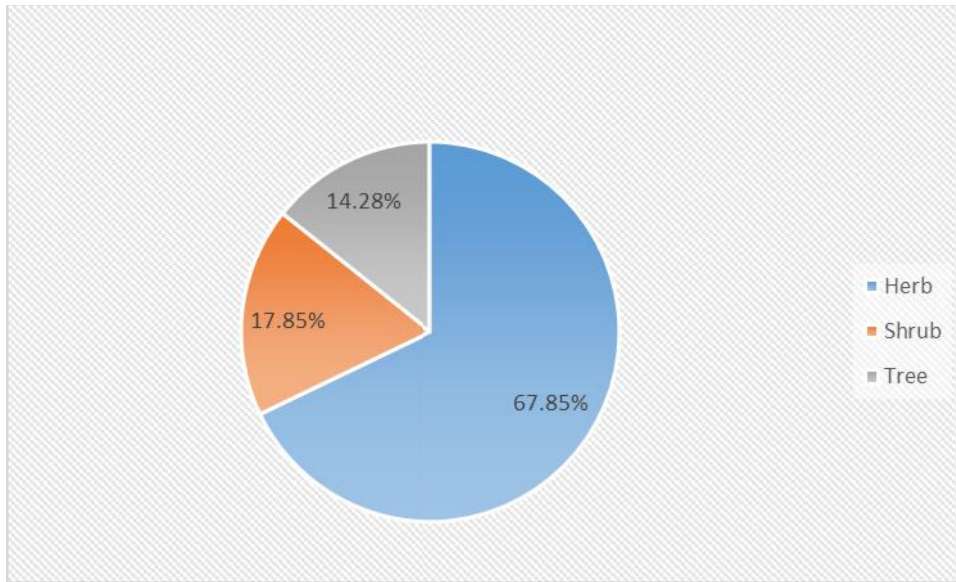


Fig.2 Habit of medicinal flora of Dandi kot

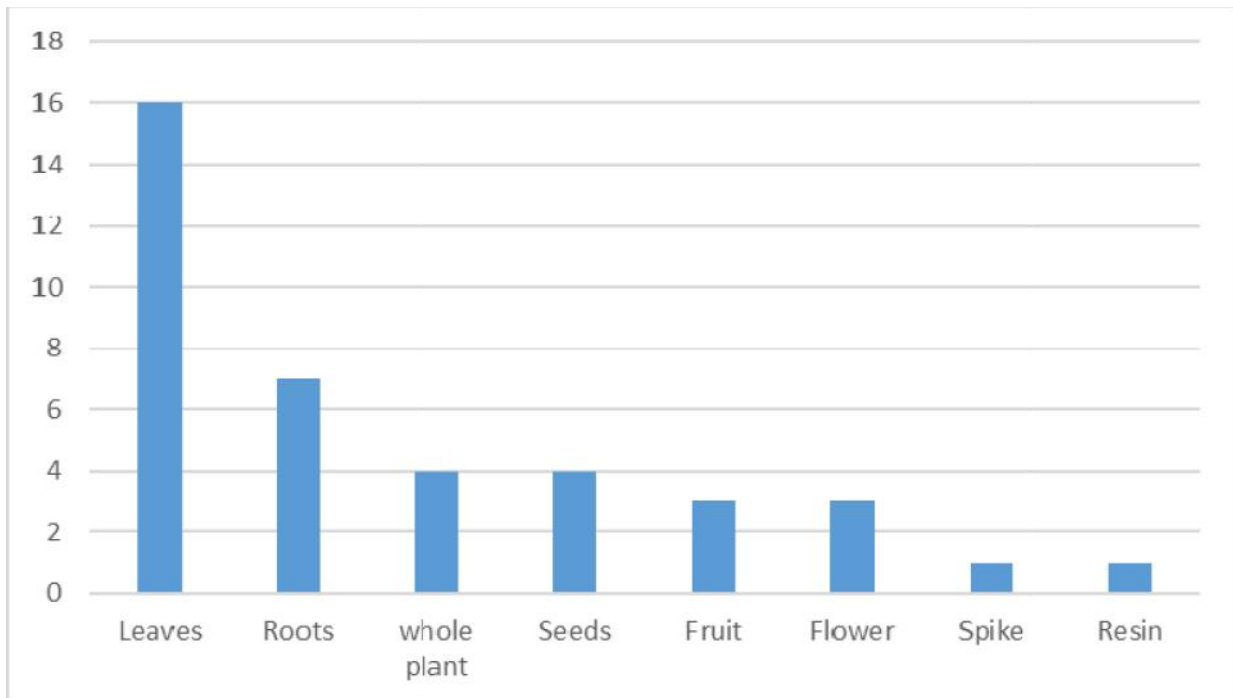


Fig.3 plant parts used of the area

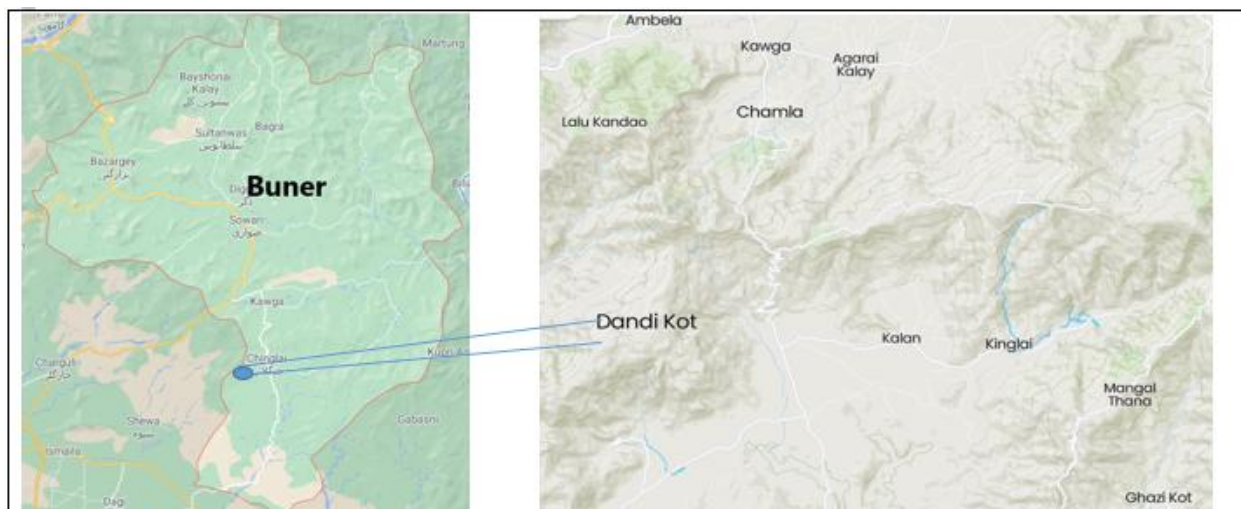


Fig. 4 Map of study Area Dandi kot, District Buner

Table 2: Quantitative ethnobotany of selected plants

S.NO	Scientific name	Number of uses by Informants (Ui)	Informants interviewed for particular plant(Ni)	Frequency of Citations (FC)	Use Value (U _{Vi})	Relative Frequency of Citations (RFCs)
1.	<i>Adiantum capillus-veneris</i>	9	40	9	0.22	0.12
2.	<i>Achyranthes aspera L.</i>	6	35	6	0.17	0.08
3.	<i>Alysicarpus vaginalis (L.) DC.</i>	8	30	8	0.26	0.10
4.	<i>Acacia modesta Wall.</i>	25	50	25	0.5	0.33
5.	<i>Boerhavia diffusa L.</i>	8	55	8	0.14	0.10
6.	<i>Butea monosperma (Lam.) Taub</i>	20	60	20	0.33	0.26
7.	<i>Cleome viscosa L.</i>	15	30	15	0.5	0.2
8.	<i>Cuscuta reflexa roxb.</i>	16	30	16	0.53	0.21

9.	<i>Commelina benghalensis L.</i>	11	25	11	0.44	0.14
10.	<i>Conyza canadensis (L.) Cronquist</i>	7	45	7	0.15	0.09
11.	<i>Datura innoxia Mill.</i>	16	65	16	0.24	0.21
12.	<i>Dodonea viscosa (L.) Jacq.</i>	50	74	50	0.67	0.66
13.	<i>Eryngium campestre L.</i>	12	25	12	0.48	0.16
14.	<i>Euphorbia heliscopia Linn.</i>	14	50	14	0.28	0.18
15.	<i>Indigofera hirsute L.</i>	10	34	10	0.29	0.13
16.	<i>Justicia adhatoda L.</i>	60	74	60	0.81	0.8
17.	<i>Mirabilis jalapa Linn.</i>	8	20	8	0.4	0.10
18.	<i>Melochia corchorifolia L.</i>	16	25	16	0.64	0.21
19.	<i>Martynia annua L.</i>	5	15	5	0.33	0.06
20.	<i>Mentha longifolia (Linn) Huds.</i>	60	71	60	0.84	0.8
21.	<i>Physalis angulate L.</i>	15	24	15	0.62	0.2
22.	<i>Rumex dentatus L.</i>	30	58	30	0.51	0.4
23.	<i>Ricinus communis L.</i>	34	59	34	0.57	0.45
24.	<i>Silybum marianum (L.) Gaertn.</i>	11	22	11	0.5	0.14
25.	<i>Urtica dioica Linn.</i>	12	50	12	0.24	0.16
26.	<i>Zanthoxylum armatum DC.</i>	20	30	20	0.66	0.26
27.	<i>Zizyphus numularia (Burm.f.) Wight &Am.</i>	47	69	47	0.68	0.62
28.	<i>Zizyphus jujube Mill.</i>	48	70	49	0.7	0.65

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