ETHNOMEDICINAL STUDY OF TEHSIL WAZIRABAD GUJRANWALA PUNJAB PAKISTAN

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ABSTRACT: An ethnomedicinal study of important medicinal plants in Tehsil Wazirabad (District Gujranwala, Punjab Pakistan) was carried out. Ninety seven plant species were described as medicinally important plants that belonged to 54 different families. These plants are wild, cultivated and ornamental from which 60% wild plants, 34% cultivated and 6% ornamental plants were reported to be of therapeutic use. Whole plant and different plant parts have been reported as utilized by local people of the study area for medicinal purpose such as leaves, roots, flowers, fruits, bark, stem and seeds. The leaves constitute 56% of plant part followed by fruit 32%, seed 24%, whole plant 20%, roots 19%, bark 9%, milky latex and flower 6%, stem 3%, rhizome and bulb both 1%. These plants are used to treat different diseases such as gastrointestinal diseases, dermatological disorders, kidney and liver problems, urogenital diseases and respiratory diseases etc. The data was quantitatively analyzed by using different parameters such as, use value (UV), relative frequency of citation (RFC), fidelity level (FL), informant consensus factor (ICF), and direct matrix ranking (DMR). The findings provide useful information about medicinal plants of the study area (Tehsil Wazirabad, District Gujranwala, Punjab Pakistan). Some plants have important role in the basic health care requirement of area such plants should be evaluated for further pharmacological study and biological active compounds.

Keywords: Ethnomedicine, Wazirabad, Relative Frequency of Citation, Informant Consensus Factor, Use Value, Direct Matrix Ranking

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INTRODUCTION

Ethnobotany plays an important role to grasp the dynamic interaction between biological diversity and social and traditional systems through traditional knowledge (Ahmad *et al.,* 2008; Maqbool *et al*., 2019). It is one of the exceedingly growing science, and people of diverse academic backgrounds are attracted (Macdonald, 2009). Now a days ethnobotany is becoming more systematic, methodical, coherent, quantitative and multi institutional (Hamilton *et al.,* 2003,).

Wazirabad an industrial Tehsil of Gujranwala District, Punjab, Pakistan is a predominant place for manufacturing of cutlery items (District Census Report Gujranwala1998). The Population of Wazirabad Tehsil is 102474 people, situated at Latitude 32,4500 (3227'0.000"N) and altitude 74,1167 (747'0.120"E). Shrivastava and Kanungo (2013) reported that there were 15 plant species observed to be successfully utilized for treating diabetes by the Uraon clan of Surguja area Chhattisgarh. (Gilani *et al.*, 2014) that common people of Pakistan have firm belief that ethno-medicinal plants are used for many diseases (Amjad *et al.,* 2015; Siddique, *et al*., 2019).) reported that ethnobotanical usages of 104 plant species were utilized as therapeutic agents. Their leaves were utilized for the formulation of indigenous formulae. Hassan *et al*. (2017) suggested that vegetation of Sangina Pakistan could be profitable medicinal plants used to treat various diseases. Miara *et al.* (2018) during a survey study in Algerian nomadic communities found that 97 medicinal plant species were used by local people for treatment of different ailments.

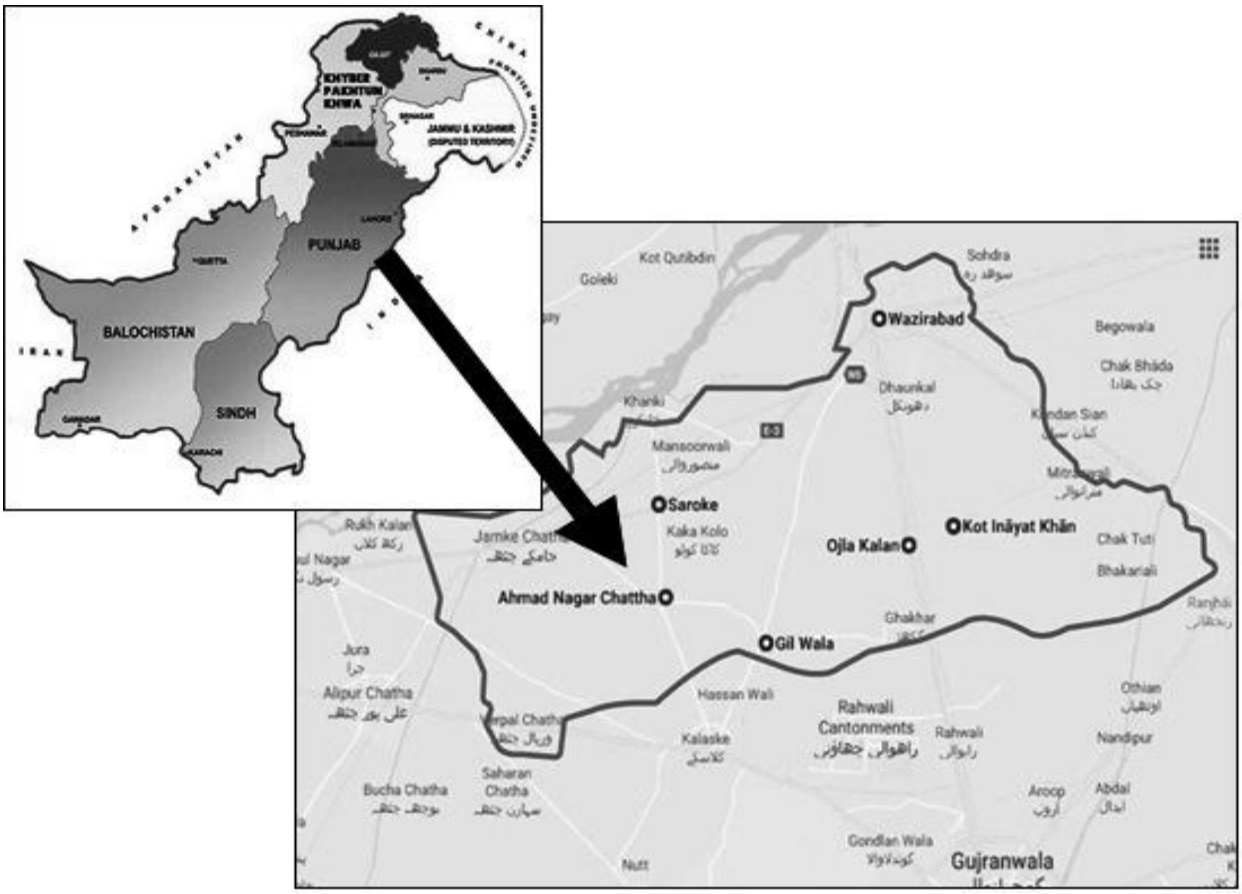

Figure 1: Map of study area (Wazirabad, District Gujranwala, Pakistan

MATERIALS AND METHODS

The study was conducted in Tehsil Wazirabad, District Gujranwala, Punjab Pakistan during October 2017- July 2018. The plant samples were collected and dried to mount on herbarium sheets (Canson Sheets)) and were identified with distinctive field guides. Voucher specimens of plant species were matched with flora of Pakistan and were placed in herbarium of Department of Botany, University of Gujrat, Gujrat Pakistan. Pencil, notebook, papers for plant pressing/drying (Blotting paper, newspaper), polythene bag, knife seizer and camera were kept ready to capture the plant species. The age of informants was from 25-85 years which include male, female and neighborhood hakims. Changing of qualitative data into quantitative was important for hypothesis testing, quantitative authentication and relative analysis (Hoffman and Gallaher, 2007). Quantitative analysis helps in identifying the medicinal importance of a plant (Andrade and Heinrich, 2011). The ethnobotanical records were evaluated by means of various quantitative indexes to test the similarity and validation, such as informant consensus factor (ICF), use value (UV), relative frequency of citation (RFC), fidelity level (FL).

Relative frequency of citation: The index of relative frequency of citation (RFC) was determined by using following formula.

$$RFC = FC/N$$

Where FC= number of informants reporting use of a species and N is the total number of informants.

Used value index: The use value was calculated by using following formula.

$$UV = \sum U_i/N$$

Where U_i is the number of uses mentioned by each informant for a given species and N is the total number of informants.

Fidelity level (FL): It is the percentage of plant specimens that the respondent claims to use for some purpose. This value is calculated as quantified for common illness and disorders.

$$FL\ (\%) = (N_p / N) \times 100$$

N_p is the number of people who claim to use plant specimens for a disease and N is the number of people who use plant remedies for any type of illness.

Informant consensus factor (ICF): The informant consensus factor was derived to seek an agreement

between the informants on the reported therapies for each group of diseases.

$FIC = N_{ur} – N_t/ (N_{ur} – 1)$

where N*ur* refers to the number of use-reports for a disease category and N_t is number of species used.

Direct matrix ranking (DMR): It is the various uses of plant species other than medicinal use for example construction, fuel, fodder and fruit etc.

Family index: Family index ranking with highest number of species used in study area belongs to a family.

RESULTS AND DISCUSSION

Research work was based on ethnomedicinal study of important medicinal plants in Tehsil .

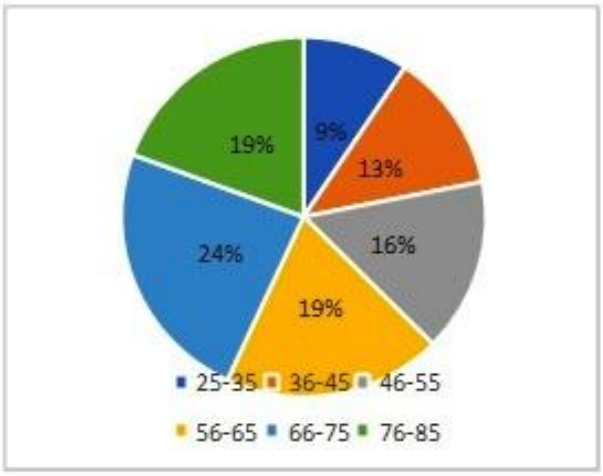

Figure 2: Age group of respondents

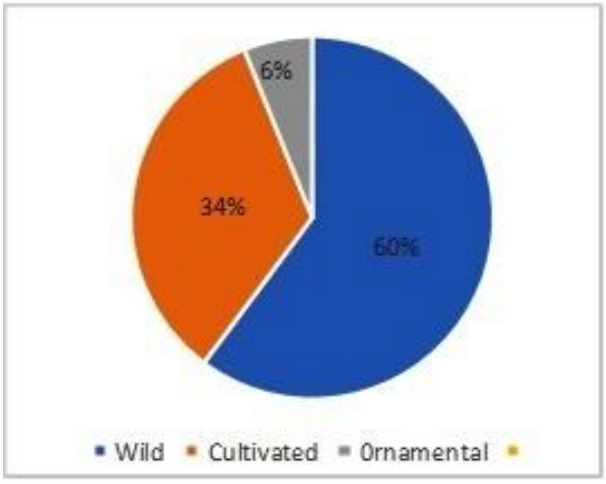

Figure 3: Percentage of plants

Wazirabad, District Gujranwala, Punjab Pakistan). Ethno-medicinal study indicated that area was rich in medicinal plants diversity and indigenous knowledge. Ninety seven plant species were described as medicinally important (Table 2) that belonged to 54 different families, these plants are wild, cultivated and ornamental. A total 60% wild, 34% cultivated and 6% ornamental plants shown in Figure 1 were reported for therapeutic use. Asteraceae, Solanaceae and Cucurbitaceae were the most prominent families with 9, 8 and 8 species, respectively, Amaranthaceae and Moraceae (5 species each), Malvaceae and Myrtaceae (4 species each), Fabaceae, Verbenaceae and Rutaceae (3 species each), Chenopodiaceae and Poaceae (2 species each) (Table 1), while other families contained one species each. The use of medicinal plants having a place with Asteraceae and Poaceae had ethnomedicinal properties, was in concurrence with ethnomedicinal plant details from different parts of Pakistan and in different zones of the world (Bibi *et al*., 2014: Kadir *et al*., 2014). (Ishtiaq *et al*., 2007) also report most commonly used medicinal plants from Solanaceae.

The leaves were mostly used plant part as 56% followed by fruit 32%, seed 24%, whole plant 20%, root 19%, bark 9%, milky latex and flower 6%, stem 3%, rhizome and bulb 1% both. The most commonly plant part used in herbal medicine was leaves utilized by the people of Italy and Islands (Bradacs *et al*., 2011; Leto *et al*., 2013). It has been testified that plants which had powerful bioactive compounds mostly described were toxic and of medicinal properties as well, however useful and harmful outcome may depend on technique of utilization and drug preparation (Bernhoft, 2010). Total 160 people as random population sample were interviewed from which most have age from 66-75 about (Figure 2).

The Use Value (UV) and Relative Frequency of Citation (RFC) were used to demonstrate that which plant species can further be used for pharmacological study and can help in drug improvement. The use value index validated the relative importance of a species in a population (Vendruscolo and Mentz, 2006). The use value of different medicinal plants is given in Table 2, the result of use value of the species can be compared with last reported from Hafizabad, Pakistan and Gujranwala Pakistan (Mahmood *et al*., 2013; Umair *et al.*, 2017). Results of this study are in conformity with previously reported work of Shafi *et al*. (2014) also conducted study to observe most common medicinal plants used by local people were *Cannabis sativa* (UV=0.77), *Fagonia indica* (UV=0.87) and *Plantago ovata* with UV 0.98 which showed their widespread utilization in indigenous herbal medication (Table 1b). During calculation of informant consensus factor, the described diseases were categorized into 10 distinctive disease categories based on their use reports (Table 3). Among these main ailment types, gastrointestinal complaints were ruled with 107 use reports trailed by dermatological disorders with use reports of 46 and urogenital diseases with 35 use reports

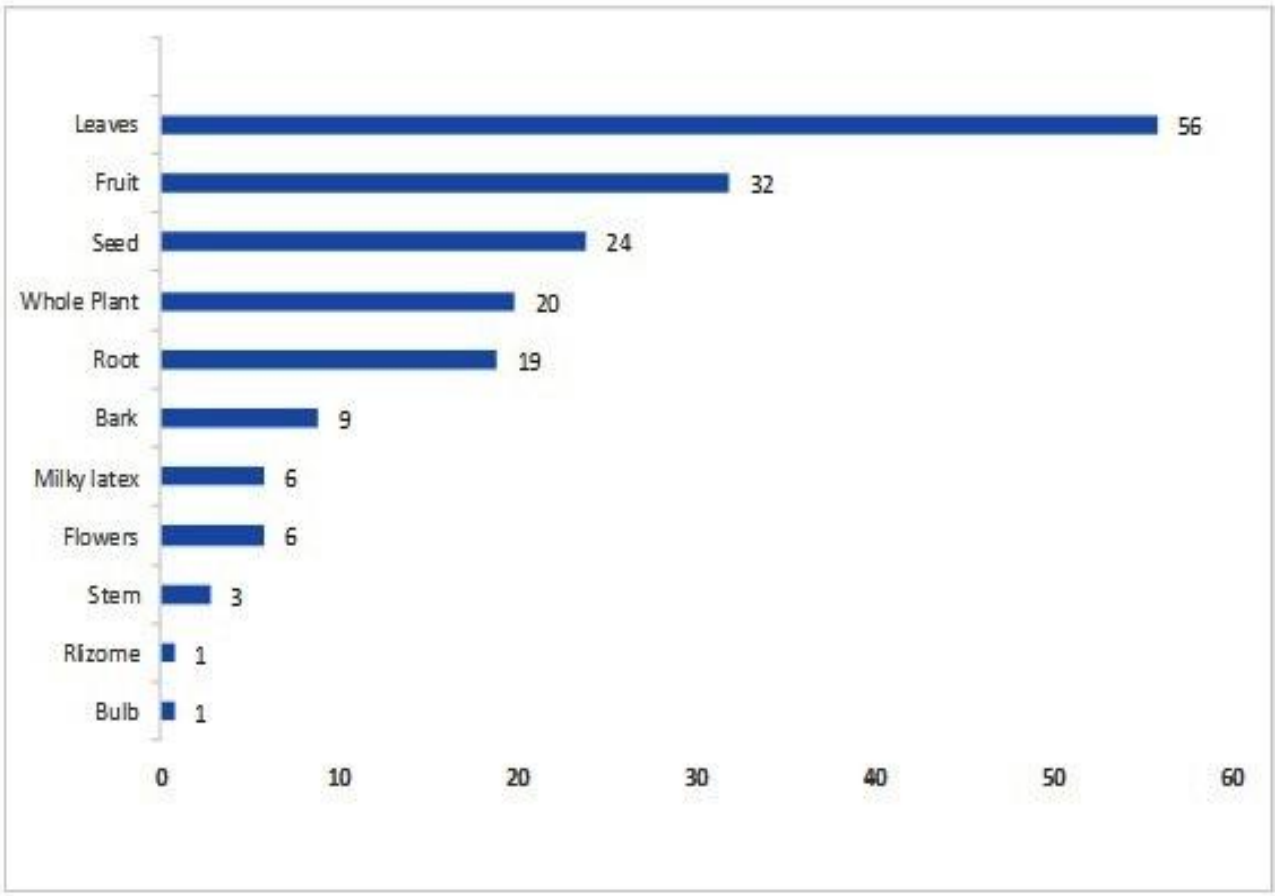

Figure 4: Percentage of plants parts used for medicinal purpose

Table-1: Family index with highest number of species used in study area (Wazirabad, District Gujranwala, Pakistan).

Sr. No.	Families	No. of species	Ranking
1.	Asteraceae	9	1st
2.	Solanaceae	8	2nd
3.	Cucurbitaceae	8	3rd
4.	Amaranthaceae	5	4th
5.	Moraceae	5	5th
6.	Malvaceae	4	6th
7.	Myrtaceae	4	7th
8.	Fabaceae	3	8th
9.	Verbenaceae	3	9th
10.	Rutaceae	3	10th
11.	Chenopodiaceae	2	11th
12.	Poaceae	2	12th

Table 2: Showing data about plants of study area and their therapeutic use.

Plant Species with Voucher No.	Common Name	Family	Habit	Part Used	UV	RFC	Therapeutic use
Abutilon indicum L. UOG-000615	Kangi booti	Malvaceae	Wild, Herb	Leaves	0.65	0.037	Bladder infection, Piles
Abelmoschus esculentus L. UOG-000616	Bhindi	Malvaceae	Cultivated, Herb	Roots, Fruit	0.51	0.043	Demulcent, cure wounds
Acacia nilotica L. UOG-000617	Kikar	Mimosaceae	Wild, Tree	Root, Bark, stem, Flower	0.87	0.1	Stomach ailments, lichorea, toothbrush, liver burn
Achyranthes aspera L. UOG-000618	Puthkanda	Amaranthaceae	Wild, Herb	Whole plant	0.82	0.087	Asthma, toothache
Alternanthera philoxeroides (Mart.) Griseb. UOG-000619	Alligatorweed	Amaranthaceae	Wild, Herb	Leaves	0.48	0.025	Female problems
Alhagi maurorum Medik. UOG-000620	Jawansa	Papilionaceae	Wild, Herb	Flowers, Roots	0.21	0.031	Piles, migraine, kidney stone
Albizzia lebbeck Benth. UOG-000621	Sharin	Mimosaceae	Wild, Tree	Flowers, Seed, Leaves	0.62	0.068	Night blindness, diarrhea, swellings
Allium cepa L. UOG-000622	Piyaz	Amaryllidaceae	Cultivated, Herb	Bulb	0.71	0.081	Diarrhea, diabetes, measles, high blood pressure, cancer
Amaranthus viridis L. UOG-000623	Ghunar	Amaranthaceae	Wild, Herb	Whole plant, Leaves	0.34	0.043	Enhance urine, loose motion
Anethum graveolens L. (Dill) UOG-000624	Soey	Apiaceae	Wild/Cultivated, Herb	Seed	0.56	0.037	Carminative, digestive problems, bad breath
Avena fatua L. UOG-000625	Jabdari/ Jangli jai	Poaceae	Wild, Herb	Seeds	0.29	0.031	Emollient, diuretic, refringent
Azadirachta indica A. Juss. UOG-000626	Neem	Meliaceae	Wild, Tree	Leaves	0.83	0.18	Inflammation, blood purifier, antimalarial, diabetes, small pox
Bumbusa arundinacea (L.) Voss ex Villas UOG-000627	Baans	Poaceae	Wild, shrub	Young shoot, leaf, root	0.74	0.075	Carminative, cold, flue, fever, skin burns
Boerhavia diffusa L. UOG-000628	Tukhm-i-ispas	Nyctaginaceae	Wild, Herb	Leaves, Root	0.54	0.056	Snake bite, cough, flue, kidney problems
Bombax ceiba L. UOG-000629	Sumbal	Malvaceae	Wild, Tree	Root, Bark	0.68	0.087	Sexual power, heal wounds
Brassica rapa var. rapa L. UOG-000630	Shaljum	Brassicaceae	Cultivated, Herb	Leaves, Fruit, Seeds	0.48	0.112	Cancer, skin burn, obesity
Calotropis procera R. Br. UOG-000631	Aak	Asclepiadaceae	Wild, Herb	Leaves, Milky latex, stem	0.87	0.187	Antidote, body pain, bone pain, clean respiratory tract, strengthens body
Cassia fistula L. UOG-000632	Amaltas	Mimosaceae	Wild, Tree	Seed, Fruit	0.71	0.156	Gastric problem, diarrhea
Cassia occidentalis (L.) Link UOG-000633	Kasonji	Caesalpiniaceae	Wild, Herb	Seeds	0.44	0.118	Control blood pressure and cholesterol level
Cannabis sativus L. UOG-000634	Bang/booti	Cannabinaceae	Wild, Shrub	Leaves, Root, Whole plant, Seed	0.81	0.181	Diarrhea, constipation, sedative
Capsicum frutescens L.	Sabz mirch	Solanaceae	Cultivated,	Fruit, Leaves	0.67	0.15	Carminative, antiseptic,

UOG-000635			Herb				digestive problems
Carthamus oxycantha M. Bieb UOG-000636	Papoli	Asteraceae	Wild, Herb	Seed and seed oil	0.72	0.131	Jaundice, ulcer
Carica papaya L. UOG-000637	Papita	Caricaceae	Cultivated, Tree	Fruit	0.68	0.118	Joint pain, Vomiting
Chenopodium murale L. UOG-000638	Karund	Chenopodiaceae	Wild, Herb	Whole plant, Leaves	0.53	0.068	Constipation, cough, stomachache
Chenopodium album L. UOG-000639	Bathu	Chenopodiaceae	Wild, Herb	Whole plant, Leaves, Root	0.74	0.137	Gastric problems, laxative, urinary problems, constipation
Cirsium arvense (L.) Scop. UOG-000640	Leh	Asteraceae	Wild, Herb	Root	0.35	0.1	Remove worms, indigestion
*Citrus sinensis (*L.) Osbeck UOG-000641	Orange	Rutaceae	Cultivated, Tree	Fruit	0.62	0.43	Carminative, blood purifier, appetizer, liver burn, cough
Cichorium intybus L. UOG-000642	Kasani	Asteraceae	Wild, Herb	Seeds, Leaves	0.73	0.131	Liver problems, hepatitis, kidney problems
Citrus limon (L.) Osbeck UOG-000643	Lemon	Rutaceae	Cultivated, Shrub	Fruit	0.81	0.162	Antioxidant, sore throat, control obesity
*Citrullus lanatus (*Thunb.) Matsum. & Nakai UOG-000644	Tarbooz	Cucurbitaceae	Cultivated, Herb	Fruit	0.68	0.106	Liver and stomach burn, diuretic, febrifuge
Cleome viscosa L. UOG-000645	Tick weed	Cleomaceae	Wild, Herb	Leaves, Seeds	0.58	0.168	Digestive problems, earache, enhance chance of pregnancy, heal wounds
Coronopus Didymus L. UOG-000646	Jangli haloon	Asteraceae	Wild, Herb	Leaves, Whole plant, Shoot	0.46	0.05	Bone fracture, blood purifier, cold, fever and flu
Cordia myxa L. UOG-000647	Lasoora	Boraginaceae	Wild, Tree	Fruit, Bark	0.37	0.0875	Broken bones, indigestion, fever
Convolvulus arvensis L. UOG-000648	Bahar bail	Convolvulaceae	Wild/Cultivated, Shrub	Whole plant, Leaves	0.51	0.043	Anthelmintic, emollient
Coriandrum sativum L. UOG-000649	Dhania	Apiaceae	Cultivated, Herb	Whole plant	0.78	0.156	Stomach disorder, control blood pressure, heart problems
Conyza canadensis (L.) Cronquist UOG-000650	Horseweed	Asteraceae	Wild, Herb	Whole plant	0.58	0.106	Diarrhea, dysentery, cold, menstrual problems
Crinum latifolium L. UOG-000651	Jangli piyaz	Amaryllidaceae	Wild, Herb	Juice of leaves	0.27	0.093	Earache, pimples
Crateva religiosa G. Forst. UOG-000652	Barna	Capparaceae	Wild, Tree	Bark, Leaves	0.36	0.125	Anti-inflammatory, antioxidant, laxative, stimulate appetite
Cucurbita pepo L. UOG-000653	Kaddu	Cucurbitaceae	Cultivated, Herb	Leaves, Seed, Fruit	0.64	0.131	Anthelmintic, emollient, increase immunity
Cucumis melo var. agrestis (Naudin) Greb. UOG-000654	Chibber	Cucurbitaceae	Wild, Herb	Fruit, Seed	0.72	0.15	Stomachache, vermifuge, treatment of burns, skin cleanser
Cucumis melo var. flexuosus (L.) Naudin. UOG-000655	Tar	Cucurbitaceae	Cultivated, Climber	Fruit	0.42	0.112	Skin burn, stomachache

Cyperus rotundus L. UOG-000656	Deela	Cyperaceae	Wild, Herb	Whole plant, Rhizome	0.27	0.068	Diarrhea, vermifuge, diuretic, menstrual complaints, dysentery
Daucus carota L. UOG-000657	Ghajar	Apiaceae	Cultivated, Herb	Leaves, Root	0.76	0.118	Blood production, blood circulation, enhance eyesight and teeth health
Delbergia sissoo Roxb. UOG-000658	Tali	Papilionaceae	Wild, Tree	Leaves, Young shoot, Bark	0.69	0.137	Dysentery, vermifuge, brighten teeth, remove bad breath
Digera muricata (L.) Mart. UOG-000659	Tandla	Amaranthaceae	Wild, Herb	Whole plant	0.28	0.08	Digestion problems, urinary diseases
Eucalyptus globulus L. UOG-000660	Safaida	Myrtaceae	Wild, Tree	Leaves	0.57	0.106	Cold, flu, fever and sore throat
Euphorbia heliscopia L. UOG-000661	Dhodak	Euphorbiaceae	Wild, Herb	Seed, Milky latex, Whole plant	0.73	0.112	Anthelmintic, athlete's foot, constipation, intestinal problems
Euphorbia hirta L. UOG-000662	Spdhodal	Euphorbiaceae	Wild, Herb	Leaves, Milky latex	0.67	0.1	Asthma, respiratory disorder, burns
Ficus benghalensis L. UOG-000663	Bohr	Moraceae	Wild, Tree	Milky latex, Young shoot	0.77	0.15	Sexual power, stomach burn
Ficus religiosa L. UOG-000664	Peeple	Moraceae	Wild, Tree	Bark, Fruit	0.74	0.143	Lichorea, back pain, toothache
Ficus carica L. UOG-000665	Anjeer	Moraceae	Cultivated, Shrub	Fruit, Leaves	0.61	0.118	Stomachache, piles, laxative, digestive problems
Ficus palmata Forssk. UOG-000666	Bedu	Moraceae	Wild, Shrub	Fruit	0.52	0.112	Constipation, lungs disorder, demulcent, laxative
Foeniculum vulgare Miller. UOG-000667	Saunf	Apiaceae	Cultivated, Herb	Seeds	0.57	0.137	Carminative, laxative, enhance eyesight, purgative, digestion problems
Fragaria ananassa Duchesne. UOG-000668	Strawberry	Rosaceae	Cultivated, Herb	Fruit	0.48	0.156	Inflammations, arthritis, kidney problems and to improve digestion.
Fumaria indica (Hausskn.) UOG-000669	Shahtra	Papaveraceae	Wild, Herb	Whole plant	0.89	0.193	Fever, diarrhea, pains, liver problems, vomiting, swollen joints
Grewia asiatica L. UOG-000670	Falsa	Tiliaceae	Cultivated, Tree	Fruit, Bark	0.38	0.118	Blood purification, constipation, urinary
Inula hirta L. UOG-000671	Inula	Asteraceae	Wild, Herb	Flower	0.26	0.05	Treatment of wounds
Lactuca serriola L. UOG-000672	Prickly lettuce	Asteraceae	Wild, Herb	Latex, Seed	0.47	0.081	Asthma, cough, sleeping problems, joint pain.
Lantana camara L. UOG-000673	Lantana	Verbenaceae	Wild, Shrub	Leaves, Root	0.33	0.112	Antimicrobial, antifungal, wounds, flue, cough
Leucaena leucocephala (Lam.) de Wit	Kubabhal	Fabaceae	Wild, Shrub	Leaves, Seeds	0.41	0.106	Toxic bite, cough, intestinal

UOG-000674							worms
Luffa acutangula (L.) Roxb. UOG-000675	Kali tori	Cucurbitaceae	Cultivated, Wine	Fruit	0.38	0.075	Venereal diseases, intestinal worms
Lycopersicum esculentum L. UOG-000676	Tmatar	Solanaceae	Cultivated, Herb	Fruit, Root	0.73	0.162	Constipation, increase blood level, skin burn, toothache, heart attack
Mentha spicate L. UOG-000677	Podeena	Lamiaceae	Wild/Cultivated, Herb	Leaves, Shoot	0.73	0.175	Stomach gas, indigestion, carminative
Melia azedarach L. UOG-000678	Dhraik	Malvaceae	Wild, Tree	Leaves, Fruit	0.68	0.15	Blood purifier, measles, fever
Mirabilis jalapa L. UOG-000679	Gulla wasi	Nyctaginaceae	Wild, Herb	Leaves, Root	0.54	0.125	Wounds, inflammation, muscular swelling, menstrual problems
Morus nigra L. UOG-000680	Kala toot	Moraceae	Wild, Tree	Leaves, Fruit	0.58	0.143	Sore throat, cough, blood purifier, carminative
Momordica charantia L. UOG-000681	Kareela	Cucurbitaceae	Cultivated, herbaceous, tendril	Fruit, Leaves	0.49	0.106	Diabetes, measles, wounds
Murraya koenigii (L.) spreng. UOG-000682	Kari patta	Rutaceae	Cultivated, Tree	Leaves	0.51	0.131	Digestive problems, vomiting, indigestion, diarrhea
Musa paradisiaca L. UOG-000683	Kaila	Musaceae	Wild/Cultivated, Herbaceous tree	Fruit, Leaves	0.62	0.137	Loose motion, digestive problems, headache, decrease stress
Nerium Oleander L. UOG-000684	Kneer	Apocynaceae	Wild, Shrub	Leaves, Root, Young stem	0.63	0.15	Toothache, earache
Nigella sativa L. UOG-000685	Kalwanji	Ranunculaceae	Wild/cultivated, Herb	Seed	0.71	0.162	Asthma, diabetes, high blood pressure, increase men fertility, indigestion problems
Oenothera rosea L'Hér. ex Aiton UOG-000686	Evening primrose	Onagraceae	Wild, Herb	Leaves	0.36	0.087	Itching, skin redness, wounds and burns
Oxalis debilis Kunth UOG-000687	Bahu phalli	Oxalidaceae	Wild, Herb	Fruit	0.64	0.143	Stomach burn, liver heat, urinary disorder
Parthenium hysterophorus L. UOG-000688	Gandhi booti	Asteraceae	Wild, Herb	Leaves, Whole plant, Flower	0.79	0.187	Constipation, toothache, diabetes
Phyla nodiflora (L.) Greene UOG-000689	Bakkun	Verbenaceae	Wild, Herb	Leaves, Whole plant	0.68	0.118	Menstrual cycle, lung infection, stomach wounds, piles
Phoenix dactylifera L. UOG-000690	Khuajoor	Arecaceae	Wild/ Cultivated, Tree	Fruit	0.57	0.087	Expectorant, laxative, demulcent, respiratory disorders
Phyllanthus niruri L. UOG-000691	Stonebreaker	Phyllanthaceae	Wild, Herb	Whole plant	0.48	0.106	Diuretic, constipation, kidney problem, stomach ache, urinary disorder

Physalis minima L. UOG-000692	Chirbooti	Solanaceae	Wild, Herb	Fruit, Leaves	0.59	0.112	Appetizer, headache, earache
Piper nigrum L. UOG-000693	Kali mirch	Piperaceae	Cultivated, Shrub	Seeds	0.62	0.168	Indigestion, food poisoning, diarrhea, vomiting in cold, antioxidant
Pongamia pinnata (L.) Pierre UOG-000694	Sukhchain	Fabaceae	Cultivated, Tree	Leaves, Young shoot	0.71	0.137	Tooth brush, carminative, rheumatism, vermifuge
Populus nigra L. UOG-000695	Popular	Salicaceae	Wild, Tree	Bark	0.52	0.093	Diuretic, antiseptic, lower back pain, arthritis, liver kidney problems
Polygonum plebeium R. Br. UOG-000696	Droonk	Polygonaceae	Wild, Herb	Seeds, Leaves	0.42	0.087	Fort bowel problems, acidity
Praecitrullus fistulosus (Stocks) Pangalo UOG-000697	Tinda	Cucurbitaceae	Cultivated, Vine	Fruit	0.48	0.1	Empower the brain
Psidium guajava L. UOG-000698	Amrood	Myrtaceae	Cultivated, Shrub	Fruit	0.67	0.15	Digestive problems, diarrhea, constipation, hepatitis
Punica granatum L. UOG-000699	Anaar	Punicaceae	Cultivated, Tree	Fruit, Seed	0.73	0.143	Piles, kidney problems, blood purifier
Rosa indica L. UOG-000700	Gulab	Rosaceae	Wild/Cultivated, Shrub	Flower	0.68	0.15	Constipation, laxative, emollient
Salvadora oleoides Decne. UOG-000701	Peelo	Salvadoraceae	Wild, Shrub	Leaves, Young branch	0.38	0.143	Liver inflammation, toothache
Solanum xanthocarpum L. UOG-000702	Mamoli	Solanaceae	Wild, Shrub	Root, Whole plant	0.56	0.112	Joint and body pain, skin problems
Solanum nigrum L. UOG-000703	Kainch mainch	Solanaceae	Wild, Herb	Leaves, Whole plant	0.62	0.168	Stomach burn, jaundice, foot worm
Spinacia oleracea L. UOG-000704	Paalak	Amaranthaceae	Cultivated, Herb	Leaves	0.58	0.106	Deficiency of iron, kidney and liver disorder, improve heart health
Syzygium cumini (L.) Skeels UOG-000705	Jamin	Myrtaceae	Cultivated, Tree	Seed, Fruit, Leaves	0.56	0.15	Diabetes, loose motion, stomach balance, diarrhea
Tinospora cordifolia (Thunb.) Miers UOG-000706	Gillo	Menispermaceae	Wild, Herbaceous vine	Leaves, Root	0.48	0.137	Typhoid, inflammation of stomach and liver, fever
Trianthema portulacastrum L. UOG-000707	Itst	Aizoaceae	Wild, Herb	Leaves, Root, Whole plant	0.56	0.175	Anthelmintic, liver infection, asthma, jaundice, diuretic
Tribulus terrestris L. UOG-000708	Pakhra	Zygophyllaceae	Wild, Herb	Seed, Leaves	0.61	0.168	Kidney problem, kidney stone
Withania somnifera (L.) Dunnel. UOG-000709	Aksn	Solanaceae	Wild, Herb	Root, Whole plant	0.47	0.15	Sexual problem, diarrhea
Xanthium strumarium L. UOG-000710	Chota dhatoora	Asteraceae	Wild, Herb	Leaves**,** Seeds	0.63	0.112	Skin problems, diuretic, sedative
Zizyphus nummularia (Brum.f.) Wight & Arn. UOG-000711	Bair	Rhamnaceae	Wild, Shrub	Fruit, Leaves	0.72	0.162	Increase sexual power, antiseptic

Table 3: Informant consensus factor by disease category reported in the study area.

Disease Category	No. of use reports	Percentage of use reports	No. of species used	Percentage of species	ICF
Gastrointestinal disorder	107	30.05	61	63.5	0.44
Respiratory disease	31	8.7	20	28.9	0.36
Dermatological disorder	46	12.90	29	30.2	0.37
Fever and toxic bites	13	3.65	13	13.54	0.00
Urogenital problem	35	9.8	32	33.3	0.09
Muscle and skeletal disorder	25	7.02	18	18.75	0.29
Cardio vascular disorder	26	7.3	23	23.95	0.12
Diabetes and cancer	8	2.24	7	7.29	0.14
Kidney and liver disorder	28	7.86	20	20.8	0.29
Ear, nose, eye, throat, teeth and head problems	37	10.3	32	33.3	0.13

Informant consensus factor (ICF): These results indicate that gastrointestinal disorders and dermatological disorders were dominant in study area and same results has been reported by (Kaval *et al*., 2014) and (Revathi *et al.*, 2013). The ailments that had highest ICF value showed higher level of resemblance in the informants in the different areas about the medicinal use of plants (Tuttolomondo *et al*., 2014). The Fidelity level (FL) of 23 important plant species ranged from 25-100% (Table.4). The high FL value of a species showed the use of a particular plant species by the local people to treat a specific disease (Bibi *et al*., 2014). *Cichorium intybus* and *Azadirachta indica* have 100% FL value against liver problems and blood purifier respectively.

Table-4: Fidelity level values of most reported medicinal plants.

Sr. No.	Species name	Common name	Major ailment	Fidelity level (FL) %
1.	*Calotropis procera*	Aak	Wound healing	73.3
2.	*Acacia nilotica*	Kikar	Weakness of bladder	75
3.	*Cichorium intybus*	Kasani	Liver problem	100
4.	*Phyllanthus nodiflora*	Bakkun	Piles	75
5.	*Ficus religiosa*	Peeple	Lichorea	25
6.	*Solanum nigrum*	Kainch mainch	Stomach burn	66.6
7.	*Syzygium cumini*	Jamun	Diarrhea	100
8.	*Melia azedarach*	Dhraik	Measles	87.5
9.	*Azadirachta indica*	Neem	Blood purifier	100
10.	*Tinospora cordifolia*	Gillo	Typhoid	63.6
11.	*Punica granatum*	Anaar	Piles	50.5
12.	*Ficus benghalensis*	Bohr	Male infertility	85.7
13.	*Pongamia pinnata*	Sukhchain	Tooth brush	78.94
14.	*Anethum graveolens*	Soey	Digestive problem	25.5
15.	*Lycopersicum esculentum*	Tmatar	Constipation	55.5
16.	*Crinum latifolium*	Jangli piyaz	Earache	33.3
17.	*Cannabis sativus*	Bhang	Sedative	82.3
18.	*Alhagi maurorm*	Phuwa	Kidney stone	44.4
19.	*Mentha spicata*	Podeena	Indigestion	78.5
20.	*Salvadora oleoides*	Peelo	Liver inflammation	37.5
21.	*Eucalyptus globulus*	Safaida	Flu	42.8
22.	*Chenopodium album*	Bathu	Gastric problem	57.8
23.	*Fumaria indica*	Shahtra	Fever	68.4

Medicinal plants are also used for many other purposes and were evaluated by direct matrix ranking (DMR) as explained by (Cotton and Wilki, 1996), it involves ten informants. Informants were selected based on their experience duration as herbal physicians in study area (Yineger *et al*., 2007). *Dalbergia sissoo* showed highest ranking followed *Zizyphus nummularia, Acacia nilotica, Azadirachta indica, Melia azedarach* and *Bombax ceiba* at 1, 2, 3, 4, 5, 6 ranking, respectively. Same investigation for over use of plants other than

medicinal purpose was also reported (Lulekal *et al*., 2013). According to (Khan and Khan, 2010) *Dalbergia sissoo* was most recorded specie in study area and DMR the wood of the plant is mostly chosen for fuel and timber.

In view of the results of investigation the accompanying suggestions are; awareness must be delivered among people for the identification of plant species and wild plant, other sources of fodder should be provided to native people, motivation to the local herbal experts to improve the utilization of conventional medication by authorizing and different encouragements.

Table 5: Direct Matrix Ranking of plant species (total score out of 10 informants) in the study area.

Sr. No.	Use	*A. nilotica*	*A. indica*	*D. sissoo*	*B. ceiba*	*M. azedarach*	*Z. nummularia*
1.	Construction	4	2	8	3	2	4
2.	Fodder	2	1	3	1	5	5
3.	Medicinal	4	5	7	2	4	2
4.	Firewood	7	8	5	4	6	7
5.	Fruit	1	3	1	0	2	9
6.	Furniture	6	4	9	2	1	4
7.	Total	24	23	33	12	20	31
8.	Rank	3rd	4th	1st	6th	5th	2nd

Direct Matrix Ranking (DMR)

Conclusion: The findings of present research work provide useful information about medicinal plants of the study/selected area. Crude drugs from these plants are mostly prepared/used in the form of infusion, decoction, extraction, paste powder etc. and used to treat different diseases such as gastrointestinal diseases, dermatological disorders, kidney and liver problems, urogenital diseases and respiratory diseases etc. The threats to medicinal plants in the study area in form of farming development, grazing, firewood and urbanization need to be managed to conserve them.

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