

ETHNOBIOLOGICAL STUDY OF FORTMONRU AND TAUNSA, PUNJAB, PAKISTAN

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Abstract

World health organization reported that 80% people in the world used the indigenous plants for their primary health care. The present study was designed to manuscript traditional knowledge of indigenous peoples, who are applying the herbal medicines in the Taunsa and Fortmonroe Punjab Pakistan. Environmental characteristics, responsible for plant distribution in Fortmonru and Taunsa region seem to be salinity, organic matter and ionic concentration Affiliation of vegetation with soil forms remained predictable for regulate the record operative considerations accountable in the supply of plants categories in Fortmonru and Taunsa region... The relationship of assured plant species to firm soil forms was mutually representing the impact of chemical conformation of the soils. The outcome revealed noticeable significant associations among soil appearances and plant species. Demographic. Features, edaphic characteristics and percentage of plant part used show significant use of traditional knowledge in Taunsa and Fortmonroe Punjab Pakistan. An ethnobiological study of important plants of Fortmonru and Taunsa, Punjab, Pakistan was carried out.103 species were designated as medicinally significant plants that belongs to 46 different families. Leaves constitute 69% followed by seed 44%, fruit35%, root31%, flower 25%, stem14%, milky latex 3%, rhizome and pulp 1% both. Fort Monroe and Taunsa are two region of south Punjab where no study was carried out regarding the ethnobiology. Plant as a whole and its parts have been reported utilized by local people hakims and practitioners as a medicine. The information concerning traditional use of plants was together from local communities through knowledgeable approval semi- structured interviews from 184 key informants. The extract of these plants parts used for the treatment of lungs, heart, gastrointestinal and dermalogical disorders, liver, kidney, gallbladder problems, pulmonary and respiratory diseases. Quantitative analysis of the indigenous medicinal plants was carried out by calculating UV value and Rfc value of each plant that provide the basic health information about important medicinal plants of Fortmonru and Taunsa, Punjab, Pakistan. Phytochemical analysis and pharmacological activities will be perform for some selected plants on the basis their medicinal importance and utilization.

Keywords: Ethnobiological, Ethnomedicinal, Fortmonru, Taunsa, Relative Frequency of Citation, Use Value.

1. INTRODUCTION

Pakistan is included of various climatic regions with exclusive biodiversity and comprises of 6000 plant species, of which roughly 400–600 species are measured to be pharmaceutically significant in the state, numerous research have described the medicinal uses of plant possessions. The traditional data on traditional herbal medicines habitually handover from one generation to another generation over verbalized method. In perpendicular transmission, probabilities of exclusion of knowledge are working in similar, which stances an enormous hazard and essential to be talked for conservation. In the preceding few years, a significant development in scientific and viable benefits has been detected owing to the traditional adequacy and commercial effectiveness of plant-based herbal medicine through the country. (Heinrich M, *et al* 2006)

Innovation and introduction to current pharmaceuticals have significantly pretentious the traditional practices in the area. The ethnomedicinal knowledge in the study area is gradually heading towards extinction because the old age community members being the main carrier of this knowledge are temporary gone and newer generation is not concerned to revenue it. Herbal practitioners in the area have satisfactory traditional knowledge, but mostly, they are disinclined to release it to other free members. Hence, the present study was intentional with the purposes to premier the traditional knowledge of study area, reserve it in the form of print literature, and segment it with other peoples throughout the world. (Ali SI, *et al* 2008) Traditional health care system of Taunsa and Fortmonroe has significant value whole plant and part of plant being used in the form of decoction, infusion, and poultice and powder form. even though the advent of allopathic medicine has somehow minimized the role of medicinally plants in favour of synthetic drugs however a number of modern drug discoveries based on medicinal plants used by indigenous people synthetic drugs are more effective than phytomedicine but they have side effects as well. (M.Ahmad, *et al* 2014)

The main scientific significance of present study of Taunsa and Fortmonroe was to acknowledged the indigenous data of local communities and made proper consideration for distribution indigenous knowledge and conservation of folklore practices of local communities. To the best of our traditional knowledge It is first report regarding the folklore uses of medicinal plants in Taunsa and Fortmonroe region of Punjab Pakistan. (M. Ishtiaq, *et al*, 2015) In the late 19th and earlier 20th centuries, there was an excessive threat of exclusion of pharmaceutical floras from treatment. Many writers clarified that medicines acquired from them had several confines with the damaging exploit of enzymes, which cause central variations throughout the procedure of medicinal plants aeration, that is, remedial plants' curative action be contingent on the method of dehydrating. In 19th century, therapeutics such as alkaloids, and glycosides insulated in clean form were progressively succeeding the preparations from which they had been quarantined. Yet, it was soon determined that though the action of uncontaminated alkaloids was quicker, the action of alkaloid drugs was complete and continuing. (Aziz MA, *et.al*, 2017) In early 20th century, maintenance methods for fresh medicinal plants were planned, specifically the ones with labile medicinal constituents. Moreover,

abundant determination was participated in the study of the situations of developed and farming of medicinal plants (Kovacevic, 2000). Inhabitants have been applying local plants for numerous resolves over many generations. Ethnobotany is the study of how people of a particular culture and area make of practice of traditional plants (WHO, IUCN4 and WWF, 1993) and is essential for considerate the collaborations between man and organic resources. It is achievement accumulative awareness through the world (Ghorbani, 2005)

Medicinal plants have been practice in health care since time ancient. Research have been conceded out worldwide to prove their effectiveness, and some of the results have directed to the making of plant-based medicines. Traditional medicine includes the range of strength applies, methods, data, and principles including plant, animal, and mineral-based medicines, psychic treatments, physical methods, and aerobics, practical individually or in mixture to sustain well-being through considering, analyzing, or avoiding diseases. (Kefalew A, *et al*, 2015) Traditional therapists and medicines made from plants play an important role in the health of lots of individuals. So, ethnobotanical trainings are beneficial in verifying, examining, and collaborating information and communication between plant variety and human cultures, how assortment in flora is used and incline by social actions of people. (Hunde D, *et al*, 2006)

Ethnobiology remains nowadays equally much logical as it is graphic, and consumes started to progress clearly its individual philosophy. Similar to ethnography, ethnobiology takes through an asset of its preparation, and comparable societal anthropology, defined by its approaches as by its theory. (Plotkin, 1995) Regions anywhere ethnobiological techniques and concept have become principally unique contain: supply pool methods; assessable design amendments; the associations between Cultural diversity and biological the problematizing of non-timber forest yield matters; store sustainability information broadcast and corrosion; assessment concept; the reasonable training of the relative to classification bioactivity of valuable types and traditional meeting; the concept of ethnobiological basis species is approximately unknown of all Concept related to the examination of ethnobiological taxonomy which already predicted by berlin in his previous studies (Nabhan, 2001)

Edaphic factors comprise procedures associated to the materialization of soil and progress of its somatic, biochemical and organic characteristics. They are documented as in performance a vigorous part in herbal annexation progressions... Soil influences perform a significant part in vegetal development, particularly on unadorned estates and retrieval tops, someplace they pay as a solid pouring strength to ecology expansion and sustainability. (Fiorentino, D. *et al*. 2018). The inclusive consonance among traditional and scientific systems all over the place is overwhelming to the interpretation that discipline is virtuously a folk or societal structure. Persons universally attention on conditional organic associations, and understand additional or fewer the similar ones. (Berlin, 1992) Secondary metabolites and chemical constituents extracted from plants shows their multifunctional effects as attractant, toxins, repellents and hormone among others. (Mirahmadi *et al*, 2011). Human use these metabolites because of presence of

pharmacological properties of these chemical substances. (Hostettmann and Terreaux, 2000). Plants consist of chemical constituent and secondary metabolites were not only creditable ancient period of medicine system but the recent medicine system shows their importance and role in current progressive research and primary health care system. (WHO,2002). Ethnopharmacology has been distinct characteristically as the learning of the communications of societies and the surroundings to collect data that provide knowledge with reference to their medicinal important and implementation of techniques for treatment of diseases. It is a composite branch of science and achievement that lines with several medicinal disciplines. These boundaries outcome in diverse attitudes and imaginary experiments. Ethnobiology inhabits a privileged position because of its potential to integrate local and global knowledge, to connect cultures and academic approaches, and to relate biological and social aspects of the human experience to the environment. (Moller, 2004)

Medicinal plants can be able to characterize a curious substitute to herb cultivation due to adaptation of large number of species to precise diverse pedo-climatic environments and enhancing the number of customers for the use of natural and health products to developing interest towards useful foods to herbal preparations.

Regardless of the recent availability of a huge number of artificial crops accomplished in good health replacing the aromas cosmetics and medicines, available from plants, there is a transformed interest in natural products from aromatic and medicinal plants. As said by Vitalini *et al.* (2009), 25% of all medical instructions are created on constituents derived from plants and plants based artificial similarities. Traditional medicines have been applicable as pre-historic period as treatments in the therapeutic production; development in systematic information has achieved because of pharmaceutical industries establishment (Thirulmalaib *et al.*, 2009). Ethnomedicinal information is a precious traditional culture of a zone that comprises data concerning the herbal utilization and organization of florescent variety by fellow. WHO anticipated traditional drug as the arrangement of information, abilities, principles and application practiced by people to treatment of diseases (Buragohain, 2011).

Worldwide, in the era 2000-2016, there has been an overall growth in equally the production area as well as cultivated zone that mainly acquired from medicinal plants, as reported by FAOstat (2016). At the European level, the statistics referring show an insignificant on the other hand rising sector, which has recorded an increase in mutually the number of pharmaceutical companies and the areas of production and participation towards ethnomedicinal products. (Ahmad *et al.*, 2008). Ethnobiology is becoming more systematic, multiinstitutional interaction between biological diversity and social traditional system extraordinarily growing science and have coherent and quantitative background (Maqbool *et al.*, 2019). Ethnobiological trainings subsidize to the information of shrub biodiversity, social consciousness about the uses, requests, ordinary incomes preservation and deliver additional communal and technical interferences for specialists (Parada *et al.*, 2009). Ethnobiological training assistances the native municipal to found the significances for native habit of plants for unlike aliments, this is also an actual source

for preservation and national information of the ranges where these significant floras happen (Ibrar *et al.*, 2007). Medicinal floras and their crops have been used effectively for numerous illnesses, equally superficially and inside. Medicinal shrub substantial has persevered as the “dealing of select” as it has no or insufficient adjacent properties (Halberstein, 2005). Ethnobiology in Pakistan is not an extremely summarized investigation part; though, many scientists have available investigation trainings about therapeutic floras. It has been stated that 84% of the people recycled old-fashioned curative plants for numerous illnesses (Shahzeb *et al.*, 2013). Therapeutically significant floras are separated into two comprehensive kinds. Primarily, floras which are recycled by native surgeons in unlike basic construction to deliver approximately release to the indigenous populations in emergent republics. Medicinal plants of Pakistan could be cost-effective and used for treatment of many disorders. (Hassan *et al.*, 2017)

The use of traditional phytotherapy in Kinmen has a long and rich history and is an indispensable part of their local culture because of its special geographical location and lack of medical resources. However, the use of phytotherapy in this area lacks written records and systematic arrangement. As indicated by most ethnobotanical research, we found that the traditional knowledge about medicinal plants in Kinmen is rapidly disappearing (Reyes-Garcia *et al.*, 2013) and may gradually be lost in the future. The practice of traditional phytotherapy in Fortmonroe and Taunsa Punjab Pakistan has an extended and ironic past and is a crucial part of their local values since of its distinct geographic locality and deficiency of medical assets. Though, the use of phytotherapy in this region shortages transcribed registers and organized preparatory method of traditional medicinal plants. As indicated by most ethnobotanical research, we found that the traditional information about therapeutic floras in Fortmonroe and Taunsa is rapidly threatened (Reyes-Garcia *et al.*, 2013) and may steadily be missing in the future.

Main objective of study

The objectives of this study were to identify, document, and analyze the significance of medicinal plants and their linked indigenous knowledge in the application and preparation of the medications by indigenous people of the Taunsa and Fortmonroe Punjab Pakistan.

2. MATERIALS AND METHODS

2.1 Environmental assessment:

The effect of different environmental factors on plant chemical constituents was determined by conduction of comparative analysis of relevant natural products in stressed and unstressed plant of different ecological units of fortmonru and Taunsa. Edaphic factor includes chemical and physical properties of soil and vegetation distribution of different locations i.e. of fortmonru and Taunsa were selected. Quadrature method was used for the quantitative study of vegetation at each locality. Three stands each measuring 100 x 100 m were establish at each locality and 15 sub-quadrates of 10x10m were laid randomly in each stand (Mueller –Dombios & Ellenberg,1974). Importance value index of each plant species was calculated and plant community at each stand was named after the species

having the highest importance value (Hussain,1989). Soil sample at 2cm depth were collected from each quadrate in labelled polythene bags and transferred to the laboratory for method described in AOAC (1984). Soil moisture and organic matter of different plant species in each plant community was recorded. Electrical conductivity was measured using consort-k520, digital conductivity meter. The ionic concentration (Na, K) of soil sample noted with flame photometer and phosphorus was recorded by spectrophotometer.

2.2 Study Area

Fort Monroe and Taunsa will be selected on the basis of its altitude and different climate condition Fort Monroe is the hill station in Dera ghazi khan city in Suleman mountain range. Its altitude 1800 meters above the sea level. Wind direction is north south due to present on the edge of Punjab province has relatively cooler weather in winter scattered snowfall is also reported in this area Temperature in winter -4°C in summer the climate of Fort Monroe is 20°C. Taunsa is dry, sandy area of D. G. Khan during hours of daylight temperature is going to reach 44°C and the temperature is going to dip to 30°C at night. Taunsa barrage spans the Indus in central Pakistan, diverting it to a vast irrigation network that serves 6 million farmers.

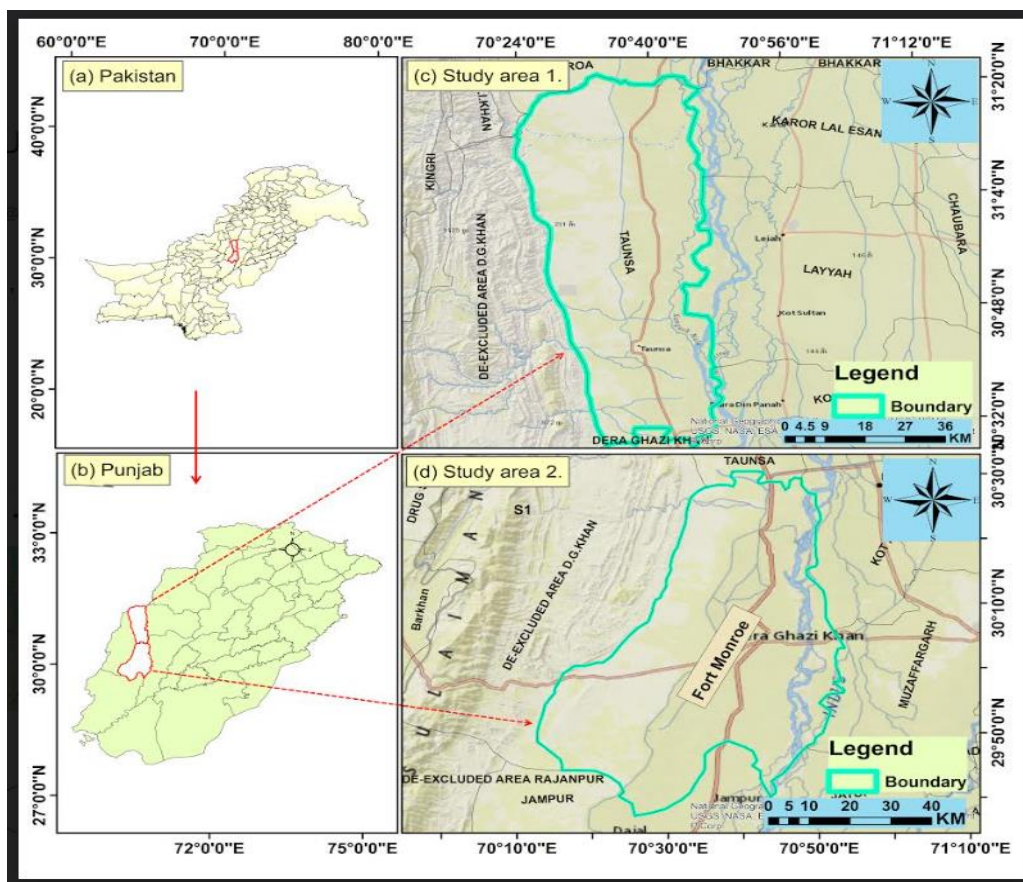


Fig 2.2: Map of study area Fortmonru and Taunsa, Punjab, Pakistan

2.3 Data Collection

The present plant collection and their use by local inhabitants was carried out through various field survey that were arranged during different seasons of the year in study area. Plants samples were collected and dried to mount on canson sheets and were identified with special field parameters.

Voucher specimen of plants species were kept for record in Perm Madan herbarium of Lahore college for women university, Lahore Pakistan. They are identified through available literature (Nasir and Ali ,1971-1991). Semi- structured interviews of informants were conducted on random basis mainly included local inhabitants, pansaries and herbalists.

A total of 184 people were interviewed belonging to different age group Indigenous knowledge of all the collected plants species are documented. Analysis of data is carried out on the basis of their medicinal uses (Table no.3.5.1) use as a food (table no. 3.5.2) and domestic uses mention in (Table no.3.5.3).

The ethnobiological record were evaluated by means of various quantitative index to test the similarity and validation, such as use value (UV), relative frequency of citation (RFC).

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.

3. RESULTS AND DISCUSSION

3.1. Demographic features of informants of Fortmonroe and Taunsa.

A total of 184 informants belonging to variable group ranges from 12 to 85 years were interviewed. Out of these 98 were females (53.2%) and 86 were males (46.7%)it was found that old people of Taunsa and Fortmonroe have much traditional knowledge as compared to young and children ones. Among the key informants 74%people are sphered, housewives, farmer and labours. The detail of demographic features of informants are given in a table (3.1).

Table 3.1: Demographic features of the informants. (N= 184) of Taunsa and Fortmonroe region Punjab Pakistan

Sr. No.	variables	Categories	Number of informants
1	Information categories.	Local hakim.	6
		Local people	178
2	Gender.	Male	86
		Female	98
3	Age groups.	12-22 years	31
		22-55 years	66
		55-85 years	87

3.2 plant part used and mode of herbal preparation

Almost all plant part are used to prepare different medicinal formulations that is root rhizomes, tubers, bark, leaves flower, fruit, young shoots and whole plants. Most frequent method for herbal formulation were decoction, powder, infusion, raw material, poultice, vegetables, latex, oil and resins. The percentage of mode of preparation are given in fig (3.2)

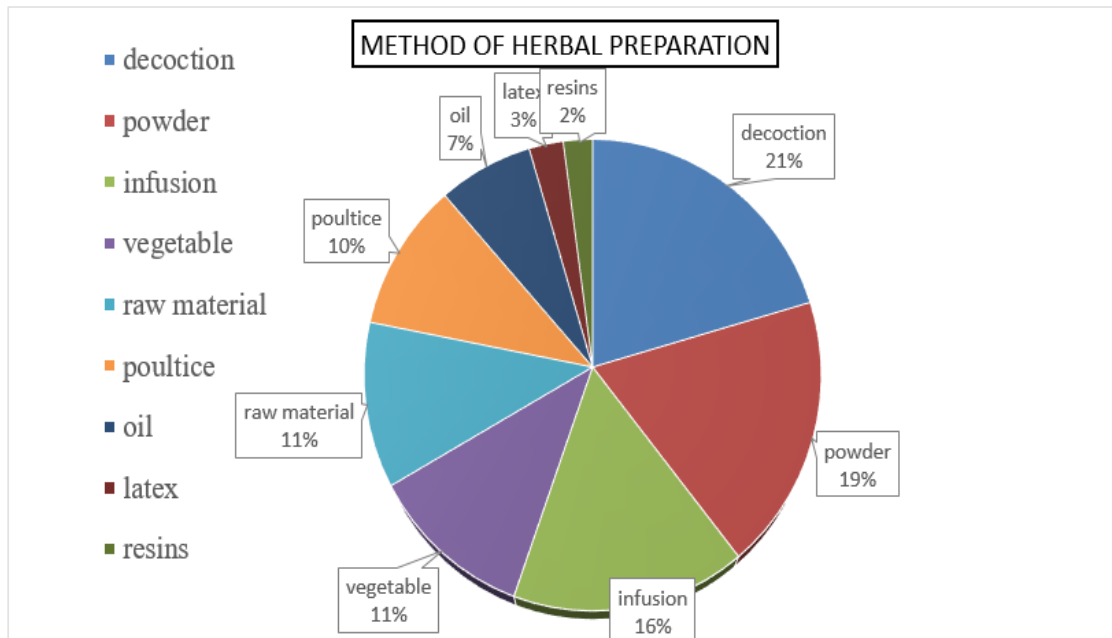


Fig 3.2: percentage of method of herbal preparation in Taunsa and Fortmonroe Punjab Pakistan

Leaves were found as record use plant part as 69% followed by seed 44%, fruit 35%, root 31%, flower 25%, whole plant 19%, stem 14%, milky latex, bulb and rhizome 1% both. The percentage of plant part used in Fortmonroe and Taunsa are given in fig (.3.3.)

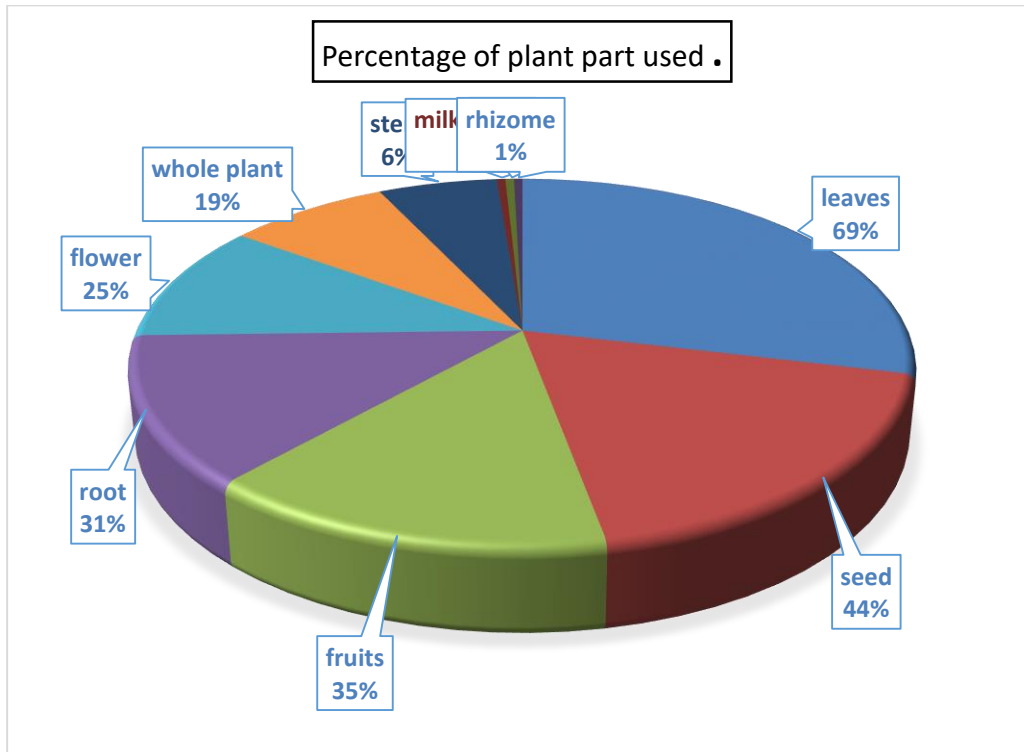


Fig 3.3: The percentage of plant part used in Fortmonroe and Taunsa

Research study was based on traditional knowledge and way of administration of medicinal plants by local people hakims and informant of 12 to 85 years of age group of Taunsa and Fortmonru region.

Results of the study shows that Taunsa and Fortmonru was rich in plants and indigenous knowledge .103 species were designated as significant on behalf of their medicinally application in study area (**Table no.3.5**). 103 species of medicinally important plants belonged to 46 families.

Family index with higher number of species shows that Asteraceae was the most noticeable family with 13 species, then Solanaceae and Poaceae were prominent families with 8 and 7 species, Euphorbiaceae and Mimosaceae (6 species each) Moraceae and Amaranthaceae (5 species each) Fabaceae, Malvaceae and Zygophyllaceae (4 species each) Apiaceae and Brassicaceae (3 species each) Rosaceae and Myrtaceae (2 species each) (**table 3.4**) while other families contain one or two species each.

Asteraceae and Solanaceae showed different medicinal properties was abundant with their ethnomedicinal uses. (*Kadir et al, 2014*).

Table 3.4: Family index with highest number of species used in study area (Taunsa and Fortmonru, Pakistan)

Sr. No.	Families	No. of species	Ranking
1.	Asteraceae	13	1 st
2.	Solanaceae	8	2 nd
3.	Poaceae	7	3 rd
4.	Cucurbitaceae	6	4 th
5.	Euphorbiaceae	6	5 th
6.	Mimosaceae	6	6 th
7.	Moraceae	5	7 th
8.	Amaranthaceae	5	8 th
9.	Fabaceae	4	9 th
10.	Malvaceae	4	10 th
11.	Zygophyllaceae	4	11 th
12.	Apiaceae	3	12 th
13.	Brassicaceae	3	13 th
14.	Rosaceae	2	14 th
15.	Myrtaceae	2	15 th
16.	Caesalpiniaceae	2	16 th
17.	Cactaceae	1	17 th

The Rfc and UV value of all the medicinal plants indicated that which plant species can advance used for bioassay and other medical studies. The use value index as by definition is the relative importance of species in specific area (umair *et al*, 2017).

The most common used medicinal plants by the local people were *Kalanchoe pinnata* (UV=0.89), *Fagonia arabica* (UV=0.88), *Zizyphus nummularia* (UV=0.81) respectively. Results of the study was comparable with earlier study reported by shafi on medicinal plants (shafi *et al*, 2014).

Plant parts have been used as a potent bioactive compound since beginning of evolution. Indigenous knowledge of plants play significant role for existence of human life and social behavior on earth.

Hocking in 1958 reported that 84% of Pakistan population fulfil their medicine needs by usage of traditional plants species for example *Punica granatum* flowers are used for the treatment of dysentery and cough and its seed are used to treat syphilis, *Cassia occidentalis* is used for the treatment of hypertension, dropsy as wel as local people use *Cassia occidentalis* for treatment of ringworm and eczema.

Leaves were found as record use plant part as 69% followed by seed 44%, fruit 35%, root 31%, flower 25%, whole plant 19%, stem 14%, milky latex, bulb and rhizome 1% both.

Bernhoft,2010 showed that plants contain chemical constituents that makes them able for their utilization in both ways either useful or harmful that depends on the methodology and technique used by scientist or researcher. Leaves was already consider as most applicable plant part for treatment of various disorders in Italy (Leto *et al*, 2013).

Table 3.5.1: Showing data about plants of study area and their traditional use

Plants species with botanical name	Vernacular name	Family	Part used	UV	RFC	Ethnomedicinal Uses
<i>Opuntia stricta</i>	Thur	Cactaceae	Fruits	0.71	0.145	Used to reduce inflammation of stomach, used in treating diabetes and liver inflammation.
<i>Psidium guajava L.</i>	Amrood	Myrtaceae	Fruits, Leaves	0.63	0.047	Used for the treatment of diarrhea, constipation and hepatitis.
<i>Polygonum plebeium R.Br.</i>	Droonk	Polygonaceae	Seed, Leaves	0.24	0.05	Used to reduce acidity, used for anti-diuretic purpose.
<i>Praecitrullus fistulosus</i>	tinda	Cucurbitaceae	fruit	0.53	0.072	Used for the treatment of hypoglycemia.
<i>Solanum nigrum L.</i>	Mako	Solanaceae	Leave, Whole plant	0.79	0.091	Used to reduce stomach burn, used to improve liver functioning in hepatitis patients.
<i>Gymnema sylvestre</i>	gurmar	Asclepiadaceae	Leaves and Flower	0.53	0.1	Leaves and extracts used to treat eye diseases, allergies, constipation, cough, dental caries, obesity, stomach ailments, and viral infections.
<i>Syzygium cumini</i>	Jamin	Myrtaceae	Seed, Leaves, Fruit.	0.43	0.072	Used by diabetes patients to control sugar level, used for the treatment of loose motion and diarrhea.
<i>Luffa acutangula L.</i>	Kali tori	Cucurbitaceae	Fruit	0.33	0.067	Used for the elimination of intestinal worms enhancing liver functioning and purify blood.
<i>Nerium Oleander L.</i>	Kneer	Apocynaceae	Leaves, Root, stem	0.51	0.1	Used to reduce ear pain, apply on teeth to reduce the toothache.
<i>Ficus religiosa L.</i>	Peepal	Moraceae	Bark, Fruit	0.63	0.106	Used for the treatment of lichorea .Bark of plant is also used to reduce back pain.
<i>Rosa gallica</i>	Chota ghulab	Rosaceae	Petals	0.75	0.15	Used as tonic for epithelial cells and also use to improve complexion of skin.
<i>Kalanchoe pinnata</i>	Patharchat	Crassulaceae	Fruits	0.89	0.104	Fruit extract used on its own or mixed with lard, is used in the treatment of bilious diarrhoea, diarrhoea, dysentery, cholera.
<i>Rosa indica Linn</i>	Gulab	Rosaceae	Fruits, Flowers, Petal	0.49	0.125	Used for the purification of blood. Petal is used for treatment of intestinal ulcer, diarrhea and anti-inflammatory action.

<i>Ageratum conzeoides</i> Linn	Ageera	Asteraceae	Stem, Leave, Root	0.32	0.162	Used to treat bruises, cuts and wounds .Plant roots and leaves are used against dysentery and diarrhea.
<i>Vernonia cinerea</i> Linn	Gandhavaki	Asteraceae	Seeds, Flowers.	0.79	0.187	used for the treatment of asthma, cough and smoking cessation
<i>Pulchea indica</i>	Mandar	Asteraceae	Leaves, Root	0.62	0.131	Used to treatment of eye diseases. Root decoction used in dysentery, diarrhea.
<i>Euphorbia helioscopia</i> Linn	Gandabuti	Euphorbiaceae	Plant juice and seed	0.75	0.162	Plant juice is applied to remove warts, used in the treatment of cholera
<i>coronopus didymus</i>	Charini boti	Brassicaceae	Whole plant	0.43	0.087	Used for malaria, phlegm in the lungs to progress digestion, used by the indigenous people for the treatment of cancer, ulcers, dysentery, eye problems, injuries, malaria, insomnia.
<i>Chenopodium botrys</i> Linn	Jausag	Chenopodiaceae	whole plant	0.28	0.072	Used in asthma, phlegm, to minimize gastric and hepatic infections. Used for treatment of pulmonary obstruction, cough, abdominal pain, nervous affections.
<i>Desmodium gangeticum</i> Linn	Salpan	Papilionaceae	Roots	0.69	0.18	Used as a tonic, febrifuge, digestive, anticatarrhal, antiemetic, in inflammatory conditions of chest.
<i>Fagonia arabica</i>	Dhamasa	Zygophyllaceae	Leaves and Fruits	0.88	0.19	Leaves are very useful in fever and skin diseases. Juice of <i>Fagonia Arabica</i> is applied to open wounds on any part of the body, and also to take bath for the patients suffering from itching.
<i>Cichorium intyblus</i>	Karni	Asteraceae	Whole plant	0.78	0.087	Used for the treatment of jaundice and prevention against liver damage. used for promoting urination and excretion of waste substances
<i>Datura metel</i> Linn	Datoora	Solanaceae	Seeds and Leaves	0.81	0.143	Leaves of Datura are mixed with mustard oil for treatment skin disorder.
<i>Chrozophora tinctoria</i>	Nilkhanti	Euphorbiaceae	Whole plant	0.69	0.106	Used to improve the elevated blood glucose level. Significant wound healing potential in the animal having physically damaged tissue in diabetic condition.

<i>Acacia farhesiana</i>	phali	Mimosaceae	Gum	0.25	0.131	Leaves are bruised with a little water and swallowed against gonorrhoea and affections of the bladder.
<i>Cannabis sativa</i> Linn	Bhang	Cannabinaceae	Flowers and Leaves	0.49	0.137	Used for the treatment of severe pain and severe nausea, spinal cord injury.
<i>Berberis lycium</i>	Kashmal	Berberidaceae	Root, Bark	0.43	0.175	Used for the treatment of diabetes, toothache, wound healing, broken bones repair, stomach ulcer and arthritis.
<i>Acacia rugata</i>	Ritha	Mimosaceae	Leaves, Seed and Pod	0.71	0.037	Used in the treatment of diarrhoea and dysentery. Infusion of the leaves are used for therapy of jaundice .
<i>Capparis spinosa</i> Linn	Kakri	Capparidaceae	Whole plant	0.43	0.031	A decoction of the plant is used to treat vaginal thrush, used to treat skin conditions, capillary weakness and easy bruising. Used internally in the treatment of coughs, and externally to treat eye infections.
<i>Physalis minima</i> L.	Chirbooti	Solanaceae	Fruits, Leaves	0.79	0.18	Used as a diuretic and antipyretic used as a remedy for headache and itches.
<i>Zizyphus nummularia</i>	Bair	Rhamnaceae	Fruits, Leaves	0.81	0.156	Used to treat scabies and other skin diseases, used traditionally in treatment of cold, mental retardation, in dysentery, diarrhoea, fever, burns and colic.
<i>Withania somnifera</i> L.	aksn	Solanaceae	Root, Whole plant	0.81	0.1	Used as an antimicrobial, anti-snake venom poison and antimicrobial, Used mainly for addressing anxiety, cancer, microbial infection, immunomodulation.
<i>Xanthium strumarium</i> L.	Chota Datura	Asteraceae	Leaves, Seeds	0.75	0.087	Leaves and root are used as an anodyne, antirheumatic, appetizer, diaphoretic, diuretic, emollient, laxative and sedative, A decoction of the root has been used in the treatment of high fevers and to help a woman expel the afterbirth.
<i>Tribulus terrestris</i> L	Pakhra	Zygophyllaceae	Seed and Leaves	0.65	0.075	Used as diuretic, aphrodisiac, antiurolithic, immunomodulatory, antidiabetic, absorption enhancing, hypolipidemic, cardiotonic, central nervous system, hepatoprotective.

<i>Pongamia pinnata</i> L.	Sukhchain	Fabaceae	Leaves, Young shoot	0.68	0.19	Used in the treatment of dyspepsia, cases of sluggish liver, bronchitis and whooping cough.
<i>Punica granatum</i> L.	Anaar	Punicaceae	Fruit and Seed	0.59	0.043	Flowers are used in the treatment of dysentery, stomach ache and cough. A decoction of the seed is used to treat syphilis.
<i>Foeniculum vulgare</i>	saunf	Apiaceae	Seeds	0.72	0.1	Seed of the plant is useful in relieving urinary disorders, useful in relieving menstrual problems and provides relief from the griping effects of laxatives.
<i>Fumaria indica</i>	shahtra	Papaveraceae	Whole plant	0.69	0.087	Used as an anthelmintic, diuretic, diaphoretic, laxative, cholagogue, stomachic and sedative activities and is used to purify blood and in liver obstruction.
<i>Daucus carota</i> L.	Ghajar	Apiaceae	Leaves, Root	0.62	0.025	Used in the treatment of edema, flatulent indigestion and menstrual problems.
<i>Euphorbia hirta</i> L.	Spdhodal	Euphorbiaceae	Leaves, Milky latex	0.65	0.068	Used to treat respiratory system disorders including bronchitis, asthma, hay fever, emphysema, coughs, colds and laryngeal spasm.
<i>Grewia asiatica</i> L.	Falsa	Tiliaceae	Fruit, Bark	0.39	0.075	Cures urinary troubles and relieves burning in the vagina, used as an astringent, stomachic and cooling agent.
<i>Cassia fistula</i> L.	Amaltas	Mimosaceae	Fruit, Seed	0.29	0.056	Methanolic bark extracts have shown significant anti-oxidant and anti-inflammatory activities.
<i>Cassia occidentalis</i> L.	Kasonji	Caesalpiniaceae	Seeds	0.32	0.087	Used in the treatment of hypertension, dropsy, diabetes, fevers, biliousness, rheumatism, ringworm and eczema.
<i>Capsicum frutescens</i> L.	Sabz mirch	Solanaceae	Fruit, Leaves	0.78	0.112	Fruit of plant used as tonic, antihemorrhoidal, antirheumatic, antiseptic, carminative, diaphoretic, digestive.
<i>Calotropis procera</i>	Aak	Asclepiadaceae	Leaves, Milky Latex, Stem	0.43	0.187	used for the treatment of asthma, stem bark is an emetic, strongly purgative and caustic.
<i>Cucurbita pepo</i> L.	Kaddu	Cucurbitaceae	Leaves, Seed, Fruit.	0.45	0.193	Seeds are mildly diuretic and vermifuge, fruit pulp is used as a decoction to relieve intestinal

						inflammation, leaves are applied externally to burns.
<i>Bombax ceiba L.</i>	Sumbal	Malvaceae	Root, Bark	0.72	0.137	Used in the treatment of cholera, tubercular fistula, coughs, urinary complaints, nocturnal pollution, abdominal pain due to dysentery, and impotency.
<i>Cirsium arvense</i>	Leh	Asteraceae	Root	0.69	0.112	Root is used as tonic, diuretic, astringent, antiphlogistic and hepatic, Chewed as a remedy for toothache.
<i>Achyranthus aspera</i>	Puth kandi	Amaranthaceae	Whole plant	0.58	0.081	Used in the treatment of dropsy, rheumatism, stomach problems, cholera, skin diseases and rabies.
<i>Aerva javanica</i>	Bui	Amaranthaceae	Flower and Leaves	0.25	0.106	Used externally to heal the wounds and inflammation of joints, for the treatment of scabies.
<i>Launea nudicaulis</i>	Dhudkal	Asteraceae	Leaves	0.39	0.068	Used to relieve fever in children, in treatment of itches of skin, cuts, ulcers, swelling, bilious fever, eczema, eruption and rheumatism.
<i>Tribulus terrestris</i>	Gokhru	Zygophyllaceae	Leaves	0.57	0.08	Used for the treatment of urinary tract healthy and reduce swelling.
<i>Ficus carica</i>	Anjeer	Moraceae	Leaves, Fruit	0.69	0.137	Used for the treatments of gastric problems, inflammation, and cancer.
<i>Ficus lyrata</i>	berri patta	Moraceae	whole plant	0.74	0.112	Used for the treatment of diabetes, liver disorders, diarrhea, inflammatory conditions, hemorrhoids, respiratory, and urinary diseases.
<i>Rhynchosia minima</i>	Tin pinda	Fabaceae	Root	0.31	0.15	Used in the treatment of diarrhoea, dysentery, used to treat hemorrhoids.
<i>Aloe Vera chinensis</i>	Aloe Vera	Liliaceae	Leaves and pulp	0.68	0.118	Used for skin conditions, such as burns, wounds, frostbite, rashes, psoriasis, cold sores, or dry skin.
<i>Carthamus oxyacantha</i>	Pholi	Asteraceae	Root	0.88	0.156	Dressing for bad ulcers, itch, joint pains, and liver diseases. Flowers decoction anthelmintic for children.
<i>Dalbergia sissoo</i>	Tali	Fabaceae	Leaves, Root and Wood	0.47	0.17	abortifacient, anthelmintic, antipyretic, aphrodisiac, expectorant and refrigerant properties.

<i>Hibiscus roco</i>	Gurhal	Malvaceae	Whole plant	0.51	0.075	Used in the treatment of cancers. For the treatment of hypertension, as a diuretic.
<i>Tribulus longipetalous</i>	Trikindi	Zygophyllaceae	Whole plant	0.74	0.089	Used as diuretic, aphrodisiac, antiurolithic, immunomodulatory, antidiabetic, absorption enhancing, hypolipidemic, cardiogenic, central nervous system, hepatoprotective, anti-inflammatory, analgesic, antispasmodic.
<i>Calligonum polygonoides</i>	Phog	Polygonaceae	Stem, Bud, Flower	0.79	0.081	Used by the local healers to treat stomach ailments and carminative
<i>Gisekia pharnaceoides</i>	Balu ka sag	Aizoaceae	Whole plant	0.43	0.092	Used to cure diarrhoea, to treat asthma, possess anthelmintic properties.
<i>Euphorbia hirta</i>	Dhoodak	Euphorbiaceae	Leaves	0.32	0.049	Used for the treatment of diarrhea, dysentery, constipation, intestinal parasites, heartburn, nausea, vomiting, colics and peptic ulcers.
<i>Zizyphus jujuba</i>	Beri	Rhamnaceae	Leaves, Root, Friut, Seed	0.79	0.11	Used as diuretic, emollient, expectorant, to promote hair growth, anticancer, sedative, blood purifier and in treatment of diarrhoea. Fruits used as liver tonic, as an antioxidant, hepatoprotective.
<i>Crotalaria burhia</i>	Chag	Fabaceae	Whole plant	0.43	0.068	Used for the treatment of tuberculosis and blood diseases, used to treat dysentery, to treat urinary infections, to reduce the intensity of smallpox.
<i>Convolvulus arvensis</i>	Wanverri	Convolvulaceae	Whole plant	0.74	0.049	Used as diuretic, laxative, strongly purgative, root is used in the treatment of fevers, used internally to reduction of excessive menstrual flow.
<i>Avena fatua</i>	Joe	Poaceae	Fruit, Leaves, Seeds	0.79	0.034	Seeds are diuretic, emollient and refrigerant.
<i>Avena sativa</i>	Jayee	Poaceae	Fruit, Leaves, Seeds	0.26	0.041	Seeds is used in the treatment of eczema and dry skin, reduces blood cholesterol levels.
<i>Anagallis arvensis</i>	Chooznee	Myrsinaceae	Fruit, Leaves, Seeds	0.61	0.037	Used for the treatment of epilepsy and mental problems, used in the treatment of dropsy, skin infections and disorders of the liver and gall bladder.

<i>Abutilon indicum</i>	Kangi booti	Malvaceae	Leaves	0.65	0.043	Used for Bladder infection, Piles.
<i>Brassica rapa var. rapa L.</i>	Shaljum	Brassicaceae	Leaves, Fruit, Seeds	0.42	0.068	Used for the treatment of Cancer, skin burn, obesity.
<i>Allium cepa L.</i>	Piyaz	Amaryllidaceae	Bulb	0.49	0.043	Used commonly for Diarrhea, diabetes, measles, high blood pressure, cancer.
<i>Bumbuga arundinacea (L.)</i>	Baans	Poaceae	Young shoot, leaf, root	0.34	0.082	Used as Carminative, for the treatment of cold, flue, fever, skin burns.
<i>Capsicum frutescens L.</i>	Sabz mirch	Solanaceae	Fruit, Leaves	0.75	0.091	Carminative, antiseptic.
<i>Boerhavia diffusa L.</i>	Tukhm-i-ispas	Nyctaginaceae	Leaves, Root	0.64	0.051	Snake bite, cough, flue, kidney problems
<i>Alternanthera philoxeroides</i>	Aligtorwe	Amaranthaceae	Leaves	0.72	0.029	Female problems. Especially reduce excess bleeding and make urinary track healthy.
<i>Acacia nilotica L.</i>	Kikar	Mimosaceae	Root, Bark, stem	0.75	0.037	Used for Stomach ailments, lichorea, toothbrush, liver burn.
<i>Amaranthus viridis L.</i>	Ghunar	Amaranthaceae	Whole plant, Leaves	0.81	0.17	Enhance urine, loose motion.
<i>Alhagi maurorum Medik.</i>	Jawansa	Papilionaceae	Flowers, Roots	0.78	0.1	Used for treatment of Piles, migraine, kidney stone.
<i>Anethum graveolens L.</i>	Soey	Apiaceae	Seed	0.52	0.058	Carminative, digestive problems, bad breath.
<i>Azadirachta indica A.</i>	Neem	Meliaceae	Leaves	0.58	0.069	Inflammation, blood purifier, antimalarial, diabetes, small pox.
<i>Citrus sinensis (L.)</i>	Orange	Rutaceae	Fruit	0.32	0.043	Carminative, blood purifier, appetizer, liver burn, cough.
<i>Carica papaya L.</i>	Papita	Caricaceae	Fruit	0.69	0.092	Used for treatment of Joint pain, Vomiting.
<i>Chenopodium album L.</i>	Bathu	Chenopodiaceae	Whole plant, Leaves, Root	0.38	0.078	Used for the treatment of Gastric problems, laxative, urinary problems, constipation.
<i>Citrullus lanatus</i>	Tarbooz	Cucurbitaceae	Fruit	0.29	0.047	Liver and stomach burn, diuretic, febrifuge.
<i>Cucumis melo var.</i>	Chibber	Cucurbitaceae	Fruit, Seed	0.39	0.048	Stomachache, vermifuge, treatment of burns, skin cleanser.
<i>Crateva religiosa G.</i>	Barna	Capparaceae	Bark, Leaves	0.79	0.1	Anti-inflammatory, antioxidant, laxative, stimulate appetite.
<i>Cyperus rotundus L.</i>	Deela	Cyperaceae	Whole plant, Rhizome	0.72	0.19	Diarrhea, vermifuge, diuretic, menstrual complaints, dysentery.

<i>Digera muricata (L.)</i>	Tandla	Amaranthaceae	Whole plant	0.43	0.078	Used for the treatment of Digestion problems and urinary diseases.
<i>Euphorbia helioscopia L.</i>	Dhodak	Euphorbiaceae	Seed, Milky latex, Whole	0.24	0.034	Laxative, used in the treatment of oedema and constipation.
<i>Phoenix dactylifera L.</i>	Pend	palmaceae	Whole plant	0.29	0.053	Used to treat respiratory diseases and fevers, used in treating diarrhoea, fruits are demulcent, expectorant and laxative.
<i>Tamarindus indica L.</i>	Imali	Caesalpiniaceae	Bark, Leaves and Flowers.	0.67	0.092	used to relives sores, ulcers, to reduce swelling and relieve pain and rashes.
<i>Capsella bursa – pectoris (L)</i>	bambaisa	Brassicaceae	Leaves, seeds and flower.	0.59	0.1	Prevent nose bleeding, regulate menstrual cycle, healing of wounds and burn.
<i>Dichanthium annulatum Forssk.</i>	Naram wakha	Poaceae	shoot	0.81	0.18	Grass is used for menorrhagia and dysentery.
<i>Lallemantrico yleana L.</i>	Tukhumbalanga	Lamiaceae	seeds	0.42	0.055	Antimicrobial, antioxidant, sedative, antidepressant, antiemetic, hypolipidemic.
<i>Cordia dichotoma Foster</i>	Lasora	Boraginaceae	Whole plant	0.72	0.098	Used to wash the head and remove dandruff, as a remedy for bad urine.
<i>Tricodesma indicum</i>	Gaozaban	Boraginaceae	Leaves	0.69	0.11	Used in the treatment of arthralgia, inflammations, dyspepsia, diarrhoea, dysentery, strangury, skin diseases, dysmenorrhea.
<i>Adiantum incisum</i>	Sumbal	Adiantaceae	FronDS	0.81	0.025	Used in the treatment of coughs, An infusion of the leaves is used as an emollient in the treatment of coughs and diseases of the chest.
<i>Helainthus annus L.</i>	Suraj makhi	Compositae	Leaves, flower, seeds.	0.66	0.047	Diuretic, astringent anti-inflammatory, cathartic and antitumor.
<i>Secale cereal M.Bieb</i>	Rye	Gramineae	Seeds	0.75	0.032	Seeds are used for the treatment of blood sugar and blood cholesterol, improve function of digestive system and use as an antioxidant.
<i>Hordeum vulgare L</i>	Barley	Gramineae	Shoot and seeds.	0.89	0.068	Lower risk of cancer and heart disease, prevent gallstone and reduce the risk of gallbladder surgery.
<i>Tamarix troupii L</i>	Lai	Tamaricaceae	Fruit, leaves, bark.	0.29	0.11	Good remedy for colds, leaves on are used to treat conjunctivitis.

Table 3.5.2: List of plants use as a fodder

	Plant name	Family	Common name	Parts used	Uses
1.	<i>Acacia jacquemontii</i>	Mimosaceae	Banwli	Leaves and pod	Leaves are good source of fodder for goats and camels. Leaves and pods are thrashed out and used as cattle fodder,
2.	<i>Capparis decidua</i>	Capparidaceae	karir	Leaves and fruit	Used for preparing vegetables, curry and fine pickles.
3.	<i>Cucumis melo var. agrestis</i>	Cucurbitaceae	Chibbar	Fruit and seed	Ripe fruit can be eaten raw, whilst the immature fruits are cooked as a vegetable, edible oil is obtained from the seed.
4.	<i>Pennisetum divisum</i>	Poaceae	murrat	Leaves and seeds	Seed being used for human food, herbage and seeds of these grasses are food for herbivores.
5.	<i>Lamaea nudicaulis</i>	Asteraceae	bhattal	Fruit and root	Used as an emergency food, herbal tea is made from the root, fruit is also used to make wine and jelly.
6.	<i>Abutilon muticum</i>	Malvaceae	Kanghi buti	seeds	Seeds cakes are used for dairy cattle and fertilizer.
7.	<i>Acacia nilotica</i>	Mimosaceae	Kikar	Flowers	Fundamental source of nutrients useful fodder source, foliage, flowers and pods are used by Afar communities to feed sheep, goats and camels.
8.	<i>Calotropis procera</i>	Asclepiadaceae	AK	Flower and seeds	flower and seed used as a feed for goat ,sheep and cattle .seed toxicity depend on environment dry condition lose toxicity effect of plants .
9.	<i>Haloxylon salicornicum</i>	Chenopodiaceae	saji	seeds	Seeds mixed with other grains for bread making, fodder for desert animals especially camel.
10.	<i>Oligocheata ramosa</i>	Asteraceae	Birham dandi	Whole plant	Given to the cattle as a fodder for greater milk production.

11.	<i>Panicum antidotale</i>	Poaceae	Bansi ghaa	Leaves	Feed resource in sheep feeding.
12.	<i>Pulicaria crispa</i>	Asteraceae	bui	Leaves	Aromatic plant, it is made into an infusion for drinking. It has a slight gingery taste.
13.	<i>Saccharum bangalense</i>	Poaceae	Sarkanda	Leaves	Food source for animals.
14.	<i>Solanum surratense</i>	Solanaceae	kandiari	Leaves	Ripe berries and cooked leaves of edible strains are used as food.
15.	<i>Lamaea resedifolia</i>	Asteraceae	dhudhkal	leaves	Versatile staple, cocoyam can also be used as weaning food, while the leaves can be cooked as vegetable.

Table 3.5.3: List of plants use for domestic purpose

Sr.no.	Plants name	family	Common name	Part use	Uses
1.	<i>Pinus roxburghii</i>	Pinaceae	Nakhtar	wood	Use for construction purposes, fuel, for making furniture, matchsticks, sleepers and window screen.
2.	<i>Prunus cornuta</i>	Rosaceae	Kala kat	Wood	Use for fuel purpose, textile bobbins, for manufacture of wheel and carts.
3.	<i>Salix babilonica</i>	Salicaceae	Majnu	Bark and wood	For manufacturing of match sticks, paper pulp, basket making, for fuel purposes and landscaping.
4.	<i>Sapium sebiferum</i>	Euphorbiaceae	Tarcharbi	Seed and Wood	Used as a fuel purpose, wax of seed coat is used for making candles and soap, use for ornamental purpose, crates and boxes.
5.	<i>Tamarindus indica</i>	Caesalpinoideae	Imli	Bark and wood	Used as a fuel, charcoal, furniture, wheels and axles, agriculture and ornamental purpose.
6.	<i>Acacia saligna</i>	leguminosae	Sunehri har	Flower, seeds and wood	Used for fuel, for making gum and soap, land stabilization.
7.	<i>Acer caesium</i>	Asteraceae	maple	Seeds and wood	Used for manufacture of

					furniture, bobbins, flooring, carving and ornamental.
8.	<i>Aesculus indica</i>	hippocastanaceae	Ban khor	Leaves and wood	Used as a fuel and ornamental purposes, also for manufacturing of handles, buckets and bowls.
9.	<i>Ailanthus altissima</i>	simarubaceae	asmani	Flower and wood bark	Used for making packing boxes, shelter belts, furniture and charcoal.
10.	<i>Alnus nitida</i>	betulaceae	sharol	Wood and flower	Used as a fuel, light construction.
11.	<i>Acacia aneura</i>	Leguminosae	Kikar	Pods and wood bark	Used as a fuel, agriculture, spears, clubs and boomerangs.
12.	<i>Ceriops tagal</i>	Rhizophoraceae	kirrari	Wood and roots	Used as a fuel including charcoal, for manufacturing of furniture.
13.	<i>Pistacia khinjuk</i>	anacardiaceae	khanjak	Wood and roots	Used as a fuel, as an oil resins and for dye purposes.
14.	<i>Populous caspica bornm</i>	Salicaceae	Chitta sufeda	Seed and wood bark	Used as a fuel, for packing of crates and cases, matchboxes and plywood etc.
15.	<i>Prunus cornuta</i>	Rosaceae	Kala kat	Wood	Used as a fuel for furniture manufacturing, textile bobbins, wheel and carts.
16.	<i>Quercus baloot</i>	Fabaceae	Bunj	Wood	Used as a fuel, handles, agriculture implements and charcoal.

3.6. Edaphic feature of study area. (Taunsa and Fortmonroe).

The outcome of the study presented that the considered indigenous and traditional plant species of Fortmonru and Taunsa grow individually on certain soils. The different vegetation types parallel evidently to definite soil salinity levels, organic matter, soil moisture and ionic concentration. soil sample analysis from altered vegetation types showed their characteristics features and vegetation.

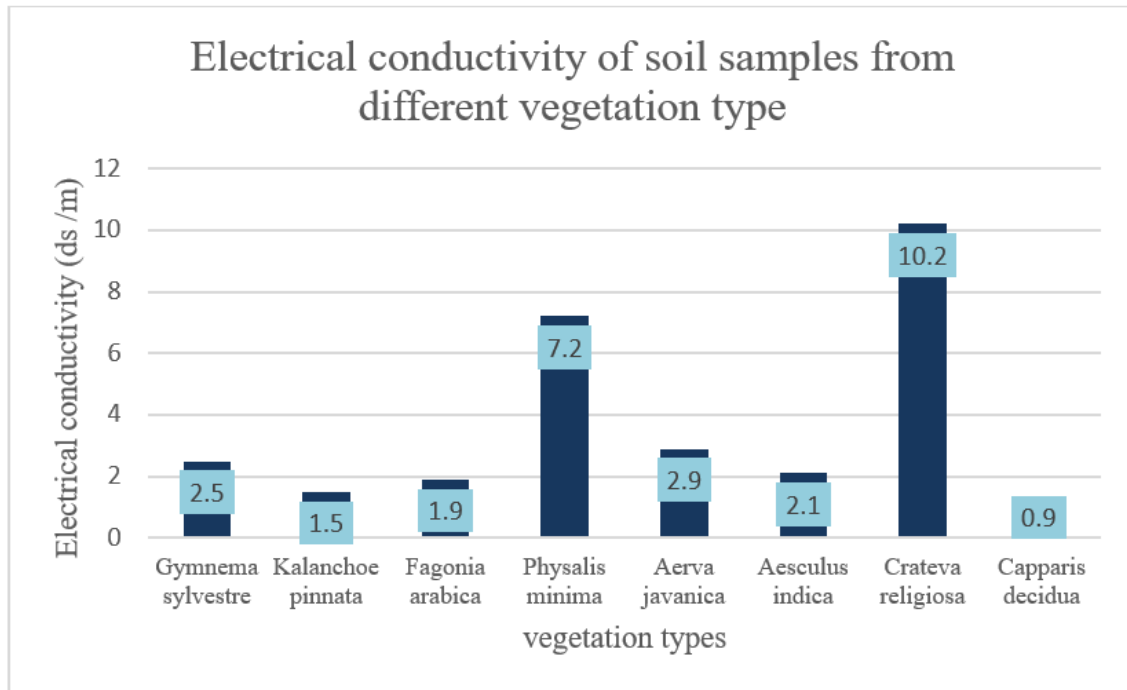


Fig 3.6.1: Electrical conductivity of soil samples from different vegetation type

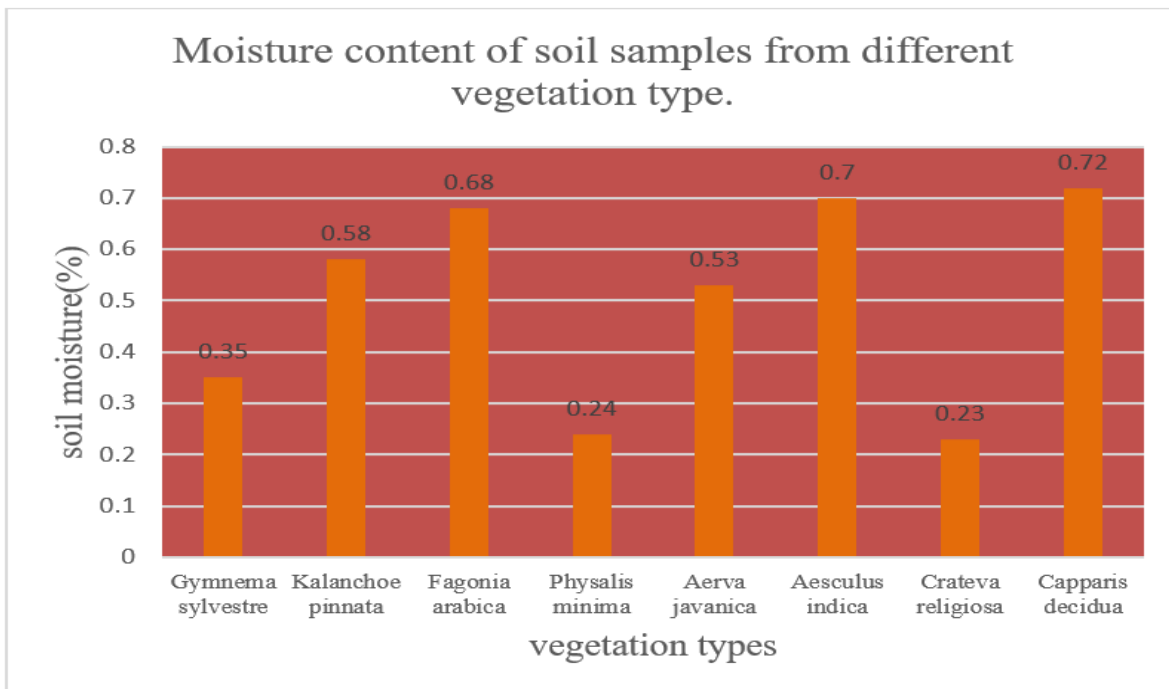


Fig 3.6.2: Moisture content of soil samples from different vegetation type

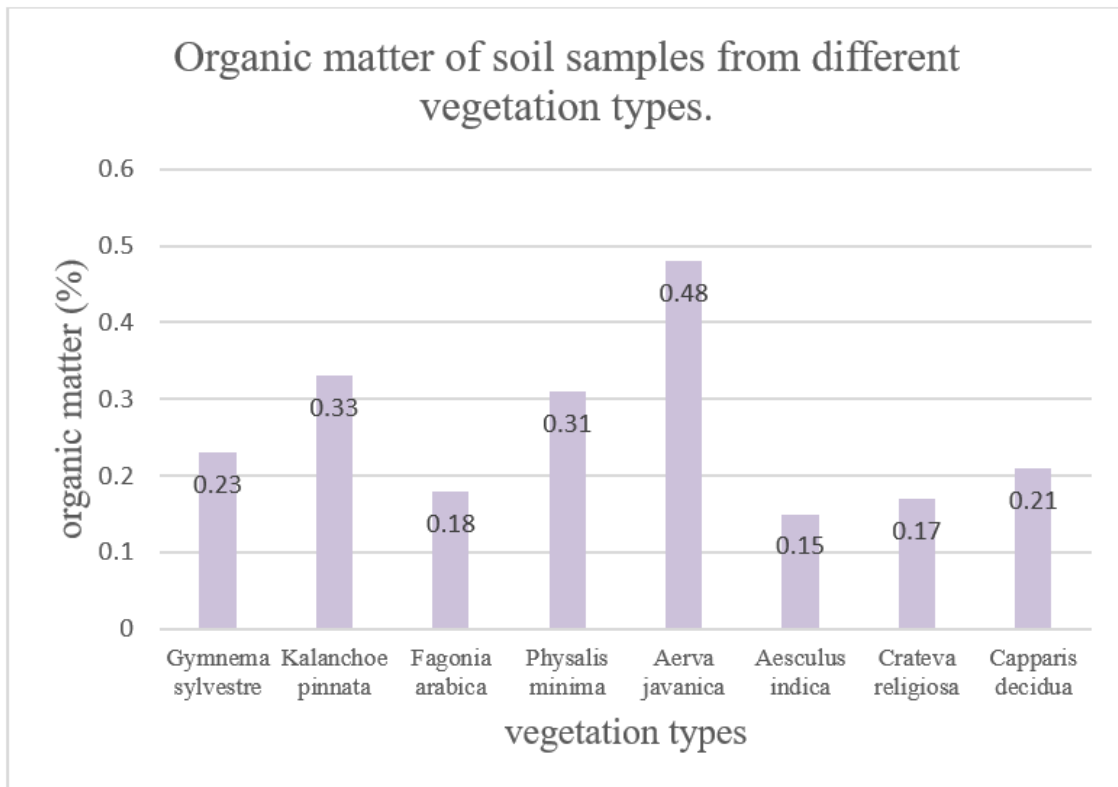


Fig 3.6.3: Organic matter of soil samples from different vegetation types

The vegetation type dominated by *Aerva javanica*, *Physalis minima* and *Kalanchoe pinnata* are characterized by relatively better organic matter and *Gymnema sylvestre*, *Capparis decidua*, *Fagonia arabica*, *Aesculus indica* and *Crateva religiosa* vegetation type occurred on low organic matter soils. Percentage of organic matter in the soil of Fort monru and Taunsa is very low, which clearly indicate the aridity resulting in light vegetation cover (Rao *et al*, 1989).The vegetation types dominated by *Aesculus indica* ,*Capparis decidua* and *Fagonia arabica* are characterized by relatively high soil moisture where as *Aerva javanica* and *Kalanchoe pinnata* showed medium soil moisture while *Gymnema sylvestre* ,*Physalis minima* and *Crateva religiosa* occurred on soil having very low soil moisture percentage.

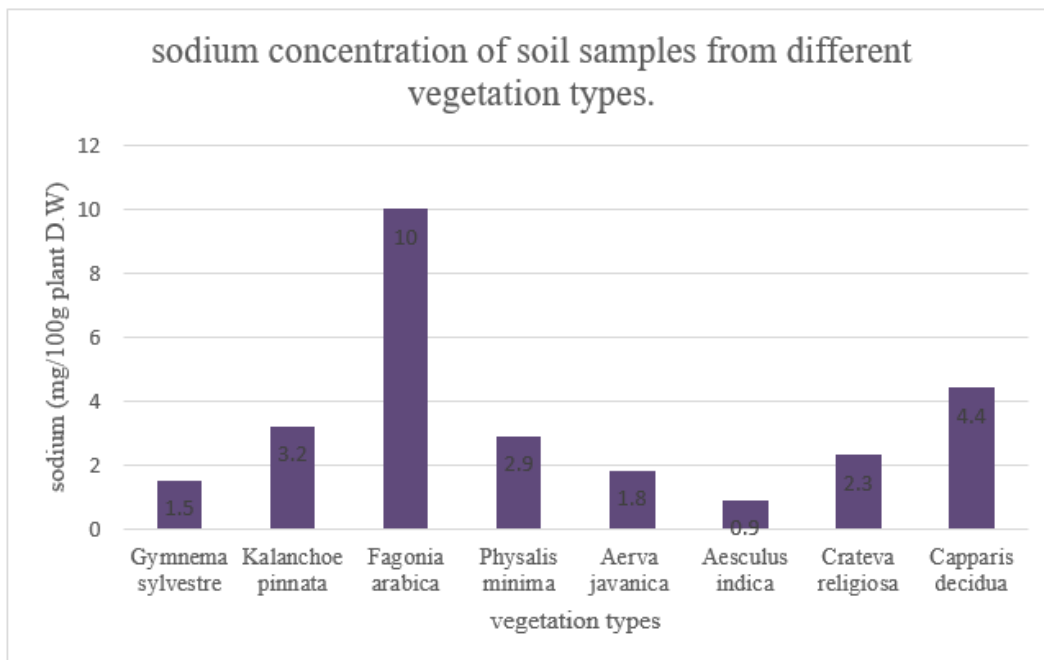


Fig 3.6.4: Sodium concentration of soil samples from different vegetation types

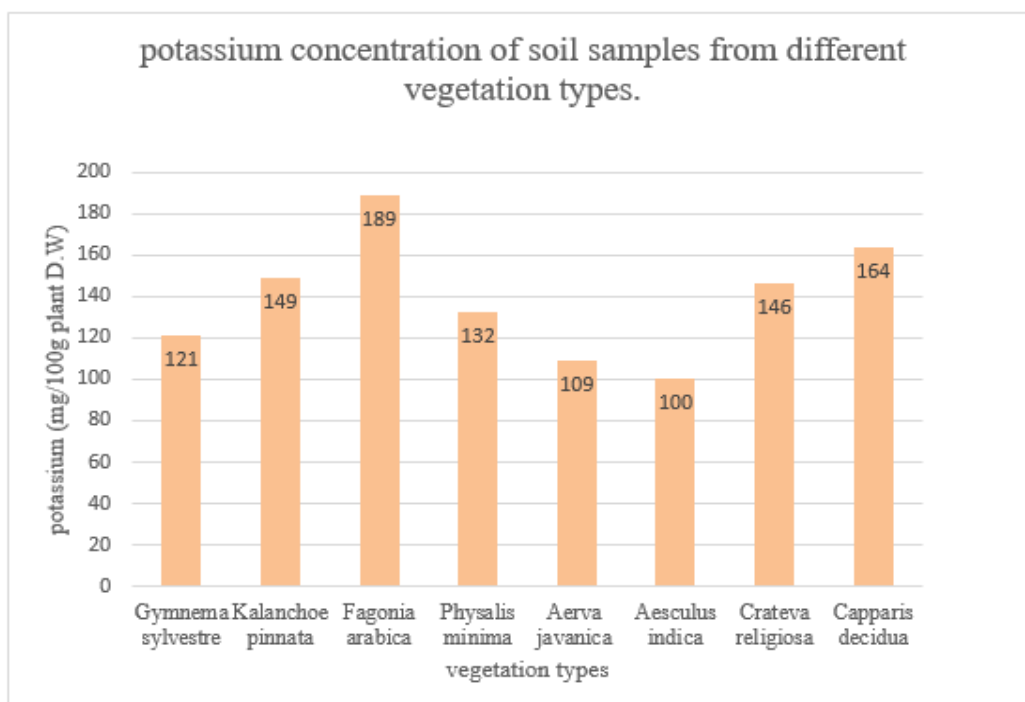


Fig 3.6.5: Potassium concentration of soil samples from different vegetation types

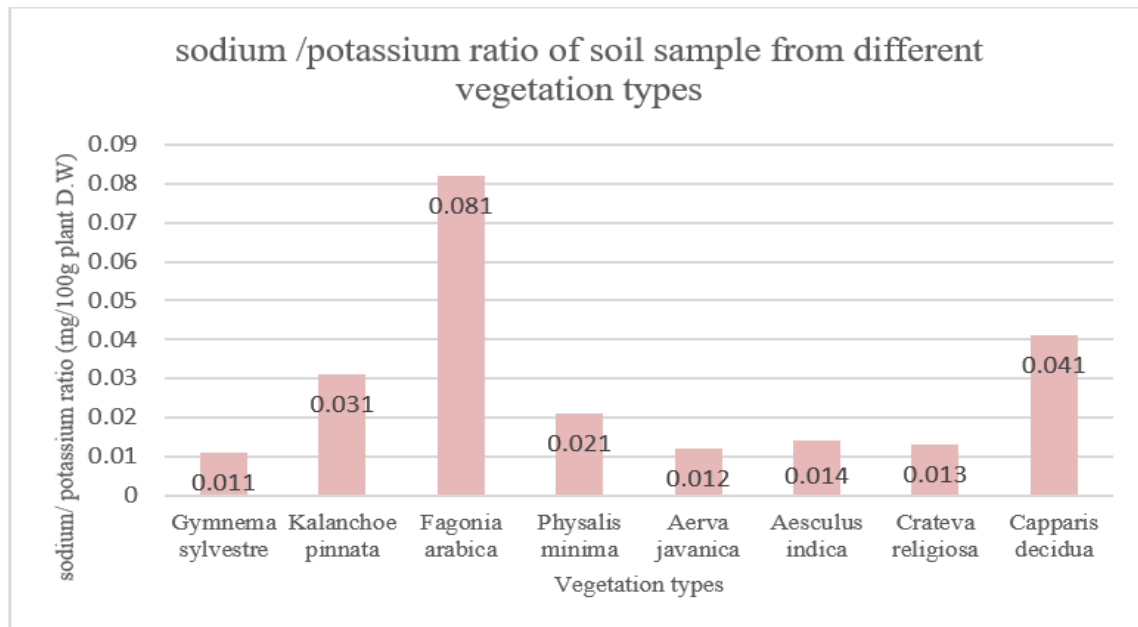


Fig 3.6.6: sodium/potassium ratio of soil sample from different vegetation types

Vegetation types dominated by *Fagonia arabica* are characterized by relatively high potassium concentration, whereas rest of vegetation types are characterized by moderate potassium concentration. The vegetation types dominated by *Fagonia arabica*, *Aerva javanica* and *Crateva religiosa* are characterized by relatively high phosphorus concentration while *Capparis decidua*, *Kalanchoe pinnata*, *Gymnema sylvestre*, *Physalis minima* and *Aesculus indica* occurred on soils with low phosphorus. Based on the result of present study, the environmental assessment could be useful in identifying the suitable habitat manipulation techniques such as top soiling and planting and irrigation techniques for the rehabilitation of degraded land of Fortmonru and Taunsa. The data is also important for the establishment of agro-systems however, there are certainly a variety of additional soil properties, which may be responsible for the distribution of plants and a variety of additional vegetation types occur in the region. It is therefore suggested that further studies be carried out on the relationship between plant and soils in Fortmonru and Taunsa. Some of the importance edaphic parameters in accordance with these parameters such as salinity and ionic concentration plant are distributed in fortmonru and Taunsa region (Arshad, 2003)

4. CONCLUSION

The overall survey of study showed that in and adjacent region of Fortmonru and Taunsa local people used herb as a medicine in their normal routine life since ancient time. The use of acknowledged plants species were reported from same place where these plants used as medicinal purposes showed that plant application as medicine is the part of their custom... This study can also assist as a valuable information about the plants this

ethnomedicinal knowledge is used as an additional effort in the field of, chemistry, photochemistry, taxonomy, pharmacy. (T. Habib, *et al* 2013)

Novelty and future impact of research

The present study highlights the role of herbal medicines in the local health care system of Fortmonroe and Taunsa. The study revealed that various medicinal plants species has been traditionally used to treatment same illness. It is recommended that fusion of such herbal species improve their pharmacological latent for therapeutic and inhibition of that diseases. Result were matched with the previously reported ethnobotanical studies to find out the novel traditional stories of use of medicinal species to treat definite disease that is restricted to indigenous community of study area. The transmission of indigenous knowledge to decendent decreasing gradually and mainly restricted to health care practitioner and elderly people .so the documentation folklore uses and promoting awareness in local communities is needed for sustainable use and conservation of medicinal plant resource. (S. Kayani, *et, et al*,2014). The evidence and knowledge accessibility in the present studies traditional uses medicinal plants is still widespread in the studied areas and essential for documentation of natural traditional knowledge before dropping this assorted resource.

References

- 1) Ahmad, I., M. Hussain, M.S.A. Ahmad and M. Hameed (2008). Spatio-temporal effects on Association of plant species in soone valley of Pakistan. *Pak. J. of Bot.* 40(5): 1865-1876.
- 2) Ali SI. Significance of flora with special reference to Pakistan. *Pak J Bot.* 2008; 40(3):967–71.
- 3) An ethnobotanical study of medicinal plants in high mountainous region of Chail valley (district Swat-Pakistan)
- 4) Arshad, M., G. Akbar and S. Rashid. 2003. Wealth of medicinal plants of Cholistan desert, Pakistan: Conservational strategies. *Hamdarad Medicus*, 105: 25-34
- 5) Aziz MA, Khan AH, Adnan M, Izatullah I. Traditional uses of medicinal plants reported by the indigenous communities and local herbal practitioners of Bajaur Agency, Federally Administrated Tribal Areas Pakistan. *J Ethnopharmacology.* 2017; 198:268–81.
- 6) Berlin B. *Ethnobiological classification.* Princeton (NJ): Princeton University Press; 1992.
- 7) Bernhoft, A., H. Siem, E. Bjertness, M. Meltzer, T. Flaten and E. Holmsen (2010). Bioactive compounds in plants benefits and risks for man and animals. *Norwegian Acad. Sci. Letters Oslo.* 57(1): 45-56.
- 8) Buragohain, J. (2011). Ethnomedicinal Plants Used by the ethnic Communities of Tinsukia District of Assam, India. *Recent Research in Science and Technology*, 3(9). Retrieved from <https://updatepublishing.com/journal/index.php/rrst/article/view/781>
- 9) FAO. 2016. Voluntary Guidelines for Mainstreaming Biodiversity into Policies, Programmes and National and Regional Plans of Action on Nutrition. Rome. <http://www.fao.org/3/a-i5248e.pdf>). Kefalew A, Asfaw Z, Kelbessa E. Ethnobotany of medicinal plants in Ada'a District, East Shewa Zone of Oromia Regional State, Ethiopia. *J Ethnobiology Ethnomed.* 2015; 11:25.
- 10) Fiorentino, D. *et al.* 2018. On the art of classification in spatial ecology: fuzziness as an alternative for mapping uncertainty. – *Front. Ecol. Evol.* 6: 231.

- 11) Ghorbani A. Studies on pharmaceutical ethnobotany in the region of Turkmen Sahra, north of Iran: (part 1) general results. *J Ethnopharmacology*. 2005; 102(1):58–68.
- 12) Halberstein, R. A. (2005). Medicinal plants: Historical and cross-cultural usage patterns. *Annals of Epidemiology*, 15(9), 686–699.
- 13) Hassan, N., D. Wang, M. Shuaib, Z. Zhong, M. Nisar, M. Ahmad and A. Khan (2017). Identification and Ethnobotanical survey of profitable medicinal plants used as remedy in Sangina Pakistan. *Int. J. Herb. Med.* 5(4): 117-123.
- 14) Heinrich M Kufer J, Leonti M, Pardo-de-Santayana M. Ethnobotany and Ethnopharmacology interdisciplinary links with the historical sciences. *J Ethnopharmacology*. 2006; 107(2):157–60.
- 15) Hills, District Shangla, Pakistan. *Pak. J. Bot.*, 39(2): 329-337.
- 16) Hostettmann, K., Terreaux, C., 2000. Search for new lead compounds from higher plants. *Chimia Int. J. Chem.* 54, 652–657.
- 17) Hunde D, Asfaw Z, Kelbessa E. Use of traditional medicinal plants by people of 'Boosat' sub-district, Central-Eastern Ethiopia. *Ethiop J Health Sci*. 2006; 16(2):141–55
- 18) Ibrar, M., F. Hussain and A. Sultan. 2007. Ethno botanical studies on plant resources of Ranyal
- 19) *J. Ethnobiology. Ethnomed.*, 10 (1) (2014), p. 36
- 20) Kadir, M.F., M.S.B. Sayeed, I. Setu, A. Mostafa and K. Mia (2014). Ethno pharmacological survey of medicinal plants used by traditional health practitioners in Thanchi, Bandarban Hill Tracts, Bangladesh. *J. Ethnopharmacology*. 155(1): 495- 508.
- 21) Kovačević N. *Pharmacognostic basics*. Faculty of Pharmacy University of Belgrade; 2000. pp. 35–212.
- 22) Leto, C., T. Tuttolomondo, S.L. Bella and M. Licata (2013). Ethnobotanical study in the Madonie Regional Park (Central Sicily, Italy), Medicinal use of wild shrub and herbaceous plant species. *J. Ethnopharmacology*. 146(1): 90-112.
- 23) M. Ahmad, Sultana, Fazl-i-Hadi, T. Ben Hadda, S. Rashid, M. Zafar, *et al.*
- 24) Maqbool, M., M. Ajaib, K.H. Bhatti, M. Ishtiaq, H. Khanum, T. Hussain, H. Ghani and W. Mushtaq (2019). Traditional knowledge based inventory of wild plants of Watala National Park and allied villages from Bhimber District, Azad Jammu & Kashmir, and Pakistan. *Appl. Ecol. Env. Res.*, 17(5):12023-12055
- 25) Mirahmadi, S.F., Sefidkon, F., Aalifar, M., Akramian, M., 2011. Essential oil composition of *Tanacetum polycephalum* subsp. *Duderanum* (Boiss) Podl. A plant endemic from Iran. *J. Essent. Oil Bear. Plants* 14, 742–745.
- 26) Moller H, Berkes E, Lyver PO, Kislalioglu M (2004) Combining science and traditional ecological knowledge: monitoring populations for co-management. *Ecol Soc* 9(3):2
- 27) Nabhan, G. P2001. *Cultures of habitat: on nature, culture, and story*. Washington, D.C.: Counterpoint.
- 28) Nasir E, Ali SI (1971-91). *Flora of West Pakistan*, Department of Botany, University of Karachi.
- 29) Parada, M., Carrie, E., Bonnet, M. À. & Valles, J. (2009). Ethnobotany of the Alt Emporia region (Catalonia, Iberian Peninsula). *Journal of Ethnopharmacology*, 124(3), 609–618.
- 30) Plotkin, M.J. 1995. *Tales of a shaman's apprentice: an ethnobotanist searches for new medicines in the Amazon rain forest* New York: Viking

- 31) Reyes-Garcia, V., Guèze, M., Luz, A. C., Paneque-Gálvez, J., Macía, M. J., Orta-Martínez, M., et al. (2013). Evidence of Traditional Knowledge Loss among a Contemporary Indigenous Society. *Evol. Hum. Behav.* 34, 249–257. doi: 10.1016/j.evolhumbehav.2013.03.002
- 32) S. Kayani, M. Ahmad, M. Zafar, S. Sultana, M. P. Z. Khan, M. A. Ashraf, *et al.* Ethnobotanical uses of medicinal plants for respiratory disorders among the inhabitants of Gallies Abbottabad, Northern Pakistan J. Ethno pharmacology. (2014), pp.15647-15660
- 33) S. Vitalini, F.Tomè, G.Fico Traditional uses of medicinal plants in Valvestino (Italy) J. Ethnopharmacology., 121(2009), pp.106-116
- 34) Schepaschenko, D. et al. Te Forest Observation System, building a global reference dataset for remote sensing of forest biomass. *Sci. data* 6, 198 (2019).
- 35) Shafi, U., R.K. Muhammad, A.S. Naseer, A.S. Sayed, M. Muhammad and A.F. Muhammad (2014). Ethnomedicinal plant use value in the Lakki Marwat District of Pakistan. *J. Ethnopharma.* 158: 412-422.
- 36) Shahzeb, S., Mahmood, R., khan, U., & Khan, S. U. (2013). Use of medicinal plants of District Bannu in Unani Medicines. *International Journal of Herbal Medicine*, 1(2), 81–88.
- 37) T.Habib,Z.H.Malik,M.A.Hussain,A.A.Awan The folklore of medicinal plants recorded from Leepa Valley, Azad Jammu and Kashmir *African J. Plant Sci.*,7(7)(2013), pp.268-272
- 38) Thirumalai, T.; Kelumalai, E.; Senthilkumar, B.; and David, E. (2009) "Ethnobotanical Study of Medicinal Plants used by the Local People in Vellore District, Tamilnadu, India, "*Ethnobotanical Leaflets*: Vol. 2009: Iss. 10, Article 10.
- 39) Umair, M., M. Altaf and A.M. Abbasi (2017). An ethnobotanical survey of indigenous medicinal plants in Hafizabad district, Punjab-Pakistan. *PLoS ONE*. 12(6): e0177912
- 40) WHO, 1993. Guidelines on the conservation of medicinal plants. World Health Organization, Geneva. [<http://www.wwf.org.uk/filelibrary/pdf/guidesonmedplants.pdf>].
- 41) World Health Organization, 2002. WHO Tradit. Med. Strategy, 2002–2005. Yousofi, M., 2007. Flora of Iran. Payam Noor University Publication, Tehran, 93, (In Persian).