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Ethnomedicinal survey of plants of Kamrani subtropical Chir forest and their effect on insect population of District Dir Lower Khyber Pakhtunkhwa Pakistan

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Abstract
The aim of this survey was to evaluate and document Ethnomedicinal knowledge of the Kamrani Subtropical Chir forest of District Dir lower Pakistan which has high medicinal plants prospective. Ethnomedicinal information's including local names, medicinal uses of plants, were collected through an open-ended questionnaire. The different growth form present in the study area were trees (22 %) herbs (56 %) and shrubs (22 %). The study showed that the local people used approximately 26 species of different plants for various diseases. The leading families were Lamiaceae followed by Poaceae and Euphorbiaceae. During the field survey it is noted that local people were unaware of proper utilization, preservation and collection of medicinal plants. Many of medicinal Plants of the study area often give potential pollinators which characterize a chief asset of energy. It is concluded from our survey that this Ethnomedicinal study will definitely provide a folkloric claim base for researchers and also asses in the treatment of local diseases.

Keywords: medicinal plants uses, threats to medicinal plants, Kamrani subtropical Chir forest

1. Introduction
A wide range of diseases can cure through allopathic medicine, but its high expenses and negative effect on health can compel people to go back to herbal plants. Presently, in pharmaceutical industry about twenty five percent of different allopathic drugs are extracted from differet plant species [1]. Among various forests diversity the utilization of different medicinal plants is as old as the history of detection and use of plants for food [2]. According to one report of World Health Organization [3], eighty percent of the global's population depend on herbal plants for their main health care needs. The search for herbal medicine has accelerated in current years. Biochemist, botanists, pharmacologists, microbiologists and natural products chemists all over the world are presently evaluating medicinal plants for phyto chemicals and direct compounds that could be developed for curing of various diseases [4]. The Himalayas across eight countries (Afghanistan, Pakistan, India, china, Bhutan, Bangladesh, Nepal and Myanmar), all of which are affluent in the larger quantity and variety of important medicinal plant species. The Himalayas range has about eight thousand angiosperm species in which more than seventeen thousand are used as a medicine. Medicinal plants (MPs) form a high proportion of non-timber forest products (NTFPs) composed from the Himalayas, and a large amount of them are highly exposed due to the rising demand for medicinal plant produce as well as from wide forest alterations [5]. Many insect pests causing greater losses to Medicinal plants. Also beneficial insects such as pollinators, vasitors, parasitoids and predators could play an important role in improving the production of these medicinal plants. A large number of investigation have carried out that insect inhabiting various medicinal plant species [6]. Pakistan is a country blessed with huge biodiversity of medicinal plants. It has been investigated that about 6,000 species of plants with potential medicinal activities are widely spread, in which 600 to 700 species are being used for medicinal purposes [7]. In these critical situations traditional herbal healers of this remote area play a very important role to give them as an alternate resource of healing services for their main healthcare [8]. The most important aim of the study is to investigate new avenues for the

sustainable utilization and conservation of threatened medicinal plants. Some of such plants are used in the traditional medicines. The popularity of herbal drugs is on the regular rise in many developed countries of the world, while in developing countries like Pakistan medicinal plants contribute significantly to the profits sources of community living in remote areas. Keeping in view the value of medicinal flora, the study was aimed to assess and document the uses of medicinal plants of the study area.

2. Materials and Methods

2.1 Study Area

District Dir Lower cover an area of 1582 square km or 611 square miles. The area lies between north latitudes 34^0 47' and 35^0 16', and east longitudes 71^0 47' and 72^0 20'. It is bounded by Afghanistan in the North West, Swat District on the east, Upper Dir District on the North east and Malakand Agency on the South. The area of District Dir Lower is dominated by mountains and hills, which are part of the Eastern Hindukush. Pakistan Meteorological Department has divided the area into different climatic data and altitudinal considerations. Sub humid, Sub tropical zone covers the planning area. Timergara is an administrative subdivision (Tehsil) of District Dir lower. The minimum temperature in timergara is upto 2.2 ^{0}C while maximum temperature is 35 ^{0}C.The average annual rainfall at Timergara is 685 mm [9]. The map of the study area is shown in figure 1.

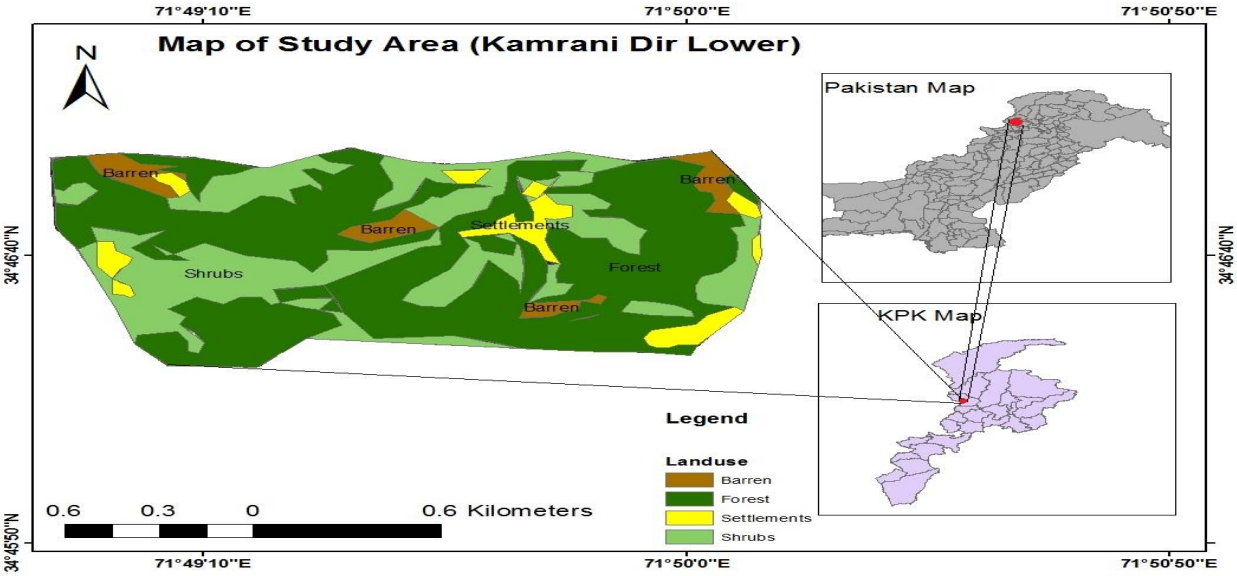

Fig 1: Map of the study area Kamrani District Dir Lower

2.2 Collection of Data

The information related to medicinal plants was collected through questionnaire. The sample intensity of questionnaires is 25% i.e. total of 100 questionnaires communicated with 400 houses. The selected area was visited many times for collection of data during the year, during Aug 2013- Sep 2014, local. During field work, interviews were conducted with the local inhabitants, selected informants, the herbalists 'hakims', pansaries (medicinal plants sellers in the local markets). Ethnomedicinal information including local names, local medicinal uses of plants, their way of local use and other related information's were collected from these people through open-ended questionnaire on the spot as most of the respondents were illiterate. Two methods i.e. observations and interviews were frequently used during the field work. During this process, local methods of medicinal plants collection, storage, drying, harvesting time, processing was done. The obtained data were then analyzed carefully.

3. Results and Discussion

In total 26 medicinal plants belonging to 21 families were documented from the study area (Table 1). The documented medicinal plants and their Ethnomedicinal uses along with common name have been summarized in Table 2. Most plants have multiple uses and in some cases multiple plants have similar uses. Whole parts of the plants followed by the leaves are frequently used by the local people for diseases treatment. These plant species are used for the treatment and prevention of many ailments. The common sickness for the people in the study area are cough, cold, bronchitis, gastritis, dysentery, diarrhea, backache, headache, wounds, cuts, etc. All the plants species are shown alphabetically mentioning their botanical name, local name, part use and their local indication is presented in Table 1.

Table 1: Medicinal plant of kamrani Subtropical Chir forest and their ethno medicinal uses

S. No	Scientific Name	Part use	Local uses
1.	*Justicia adhatoda* L.	Whole plant	Use in cough and asthma
2.	*Acacia modesta* Wall.	Gum	Gum is restorative. Used for backache especially for women after delivery.
3.	*Ajuga bracteosa* Wall. Ex Bth.	Whole plant	For the curing of achenes, jaundice, hypertension, body coolant, sore throat, blood purification.
4.	*Ailanthus altissima* (Mill.) Swingle	Bark	For curing dysentery and diarrhea
5.	*Aristida mutabilis* Trin. & Rupr.	Leaves	Use for purification of blood
6.	*Cynodon dactylon* L.	Whole plant	It is laxative, astringent, Diuretic
7.	*Chenopodium ambrosioides* L.	Leaves and Stem	Relieve backache, Dried powdered used for cough and motion in infants
8.	*Conyza Canadensis* (L.) Corgn.	Vegetative portion	As homeostatic, stimulant, diuretic portion and astringent. It is also used in diarrhea and dysentery.

9.	*Dodonaea viscosa* (L.) Jacq.	Leaves, Seed	Used in rheumatism, swelling and burns. Bandages are made of made of leaves, which is useful in wound healing
10.	*Euphorbia hirta* L.	Whole plant	peptic ulcer, dysentery, Vomiting
11.	*Euphorbia falcata* L.	Leaves, Oil, Stem	It is used as flavoring agent, antiseptic, antiperiodic in asthma.
12.	*Euphorbia prostrate* L.	Shoot	It is useful in skin diseases, e.g itching and ringworms.
13.	*Mentha longifolia* (L.) L.	Leaves	Used for diarrhea, stomachache and as a carminative.
14.	*Monotheca buxifolia* (Falc.) A. DC.	Fruit	it fruit is laxative, digestive and commonly used in urinary tract diseases
15.	*Otostegia limbata* (Bth.) Boiss.	Leaves	For gum diseases and curing of wounds.
16.	*Oxalis corniculata* L.	Whole plant	Used for gum diseases and curing of wounds.
17.	*Olea ferruginea* Royle	Fruits, leaves, trunk	Leaves are used in Toothache, as astringent, antiseptic, diuretic, antiperiodic also used in soarthroat
18.	*Sageretia thea* (Osbeck)	Leaves	skin diesese and cancer
19.	*Solanum surattense* Burm. f.	Whole plant	As expectorant, stomachic and diuretic. It is used in asthma, cough, fever, gonorrhea and pain in chest Dried powdered fruits are used in diabetes and fever in small babies. The powdered drug is used for headache, toothache and nose irritation.
20.	*Teucrium stocksianum* Boiss.	Whole	An anti-hypertensive, anti- inflammatory, anti-diarrhea, anti-diabetes and anti-convulsant agent
21.	*Teucrium royleanum* Wall. Ex Bth.	Whole	Anti-hyperntensive, anti-bacterial, anti-diarhea and anti- diabeties.
22.	*Rumex hastatus* D. Don.	Leaves, young shoots	carminative, purgative, diuretic and for stomach problems
23.	*Pinus roxburghii* Sargent	Resin	The resin is used against ulcer, snake bites and skin diseases
24.	*Periploca aphylla* Dcne.	Whole plant	The plant decoction is used as purgative, while the milky juice is applied to tumors and swellings.
25.	*Verbascum thapsus* L.	Leaves, flowers	Used in diarrhea and dysentery of cattle. It is used as analgesic antiseptic and wounds healing Its leaves and flowers are used in paste form against cough and pulmonary diseases. Seeds are narcotic. Warm leaves are used to treat rheumatic pains
26.	*Ziziphus nummularia* (Burm. f.) Wight & Arn.	Root	Root is used against diabetes and chronic fever.

3.2 Collection of medicinal plant

The present study revealed that beside men and children, women also take part in the collection of medicinal plants in the study area. About 50 % children, 34 % men, 8 % women, 6 % men and women and 2 % women and children take part in the collection of medicinal plants as shown in Fig 2.

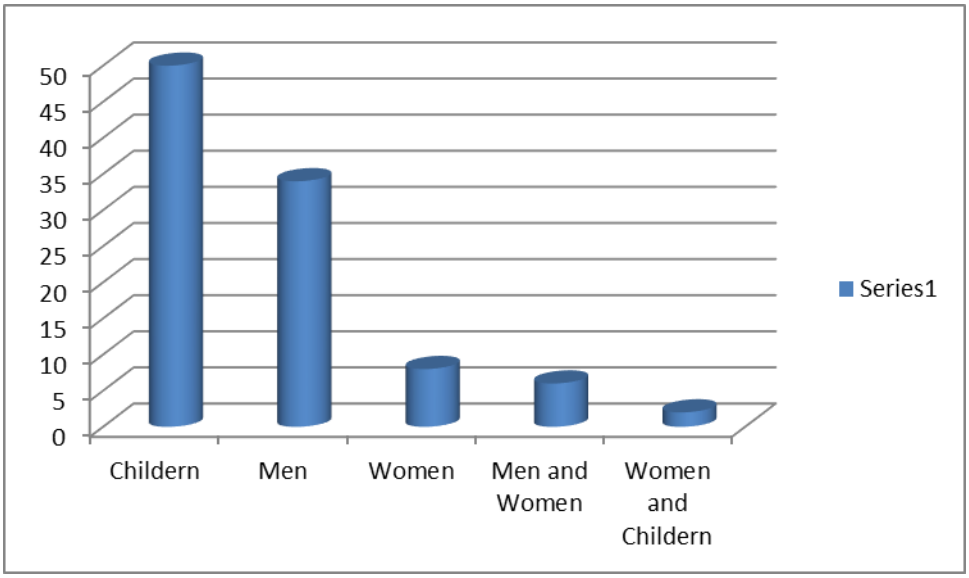

Fig 2: Percentage of collected of medicinal plants

3.3 Potential threats to MPs of kamrani Subtropical Chir Forest

There were various factors affecting medicinal plants in the study area. The factors responsible for medicinal plants depletion were habitat destruction due to deforestation (25 %), lack of alternate source of energy (20 %), inappropriate collection (13 %), overgrazing (12%), poverty (7 %), overpopulation (6 %) and other reason (7 %).

Deforestation has been observed as the key threat to medicinal plants of the area. One of the important reasons pertaining to community dependence on natural resources is lack of alternative source of fuel and energy. Most of studied population fulfills their energy requirements from forest resources. Low portion of community uses liquefied fuel gas (LPG) for cooking in addition to fuel wood. 13 % respondents agreed that inappropriate methods of collection and over harvesting are other factors putting medicinal flora at stake. Majority of collectors are unaware about the proper collection techniques, collection season and required quantity. 12 % respondents were of the view that grazing is a potential threat to medicinal plants of the study area. Free grazing is commonly practiced in the study area. This generates tremendous pressure on the medicinal flora of the area. 7 % respondents agreed that poverty is a major factor in putting

exacerbating pressure on forest resources in general and medicinal plants in particular. 6 % respondents agreed increase in population has carried out the negative impact on fragile forest resources. The community has been engaged in clearing forest. This had adversely affected the health of habitat for medicinal plants and the majority of the species is disappearing slowly. Other factors analyzed as threats to medicinal plants were changing cultivation pattern, unplanned tourism activities and mining.

Table 2: Potential threats to MPs of kamrani Subtropical Chir Forest

S. No	Causes of medicinal plants depletion	% of Respondents
1	Deforestation	25
2	Lack of alternate source of fuel and energy	20
3	inappropriate collection	13
4	Overgrazing	12
5	Poverty	7
6	Overpopulation	6

3.4 Insect population

Many of the Medicinal plants found in the study area represented an important asset of energy often give potential pollinators with valuable rewards, with nectar. Flowers are often intended so that the reward is available only to the arthropod or animal that is most likely to deliver its pollen to the stigma of an appropriate flower but won't be wasted on visitors unlikely to aid in pollination. Acacia modesta is one the best species for Apiculture which is available in the study area. Bees boxes were observed in the study area which were brought to forest area for honey production, which would uplift the socioeconomic condition of the community.

4. Socioeconomic status of local community of the study area

4.1 Profession

Data analysis revealed that 10% were government servants, 40% were farmers, 20% were labors, and 16% were unemployment. The 14% of the population were students in the study area. The average income of 12% respondents was Rs.208000 of 25-34 age, 16% of respondents was Rs.210000 of 35-49 age, 64 % of respondents income was Rs.192500 of 50-64 age, and 6% income Rs.210000 of 66-80 age ranges in figure showed in Table 3. Samilar study conducted by Munanura [10], studied that most of the respondents got married (>93%) at age of 30 years and their household size was 4. 18 percent of sample were 5 and 9 children in the household. Most participants (62.8%) income was less than 10,000 Rwandan Francs (approximately 15 US dollars) monthly and over 31 percent had no income at all.

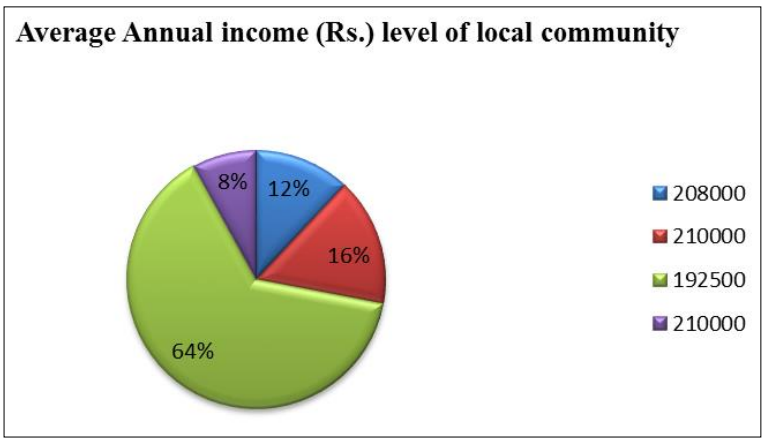

Fig 3: Average Annual income of the local community of the study area.

5. Conclusions

In the present research work, it is noted that the sites were subjected by few medicinal plant species which would imply overutilization. The rural community not only used the medicinal plants for primary health care but also used for different purposes like firewood, grazing, fencing, charcoal, etc. The major threats in the area were deforestation, lack of alternate source of energy, overgrazing, ignorance, overpopulation, inappropriate collection of medicinal plants and human settlement to the growing area. At present time transmission of such knowledge from herbalists to the public had been enormously decreased. It is also concluded that there were many medicinal plants in the study area which provide best inhabiting services to insects. The present research in this area proved that most of the indications prescribed are related to the local society diseases like, blood pressure, diarrhea, diabetes, fever, asthma etc. which will be definitely helpful for the society members in developing country like Pakistan. A great variety of plants were used by traditional healers for treatment of numerous diseases.

6. Recommendations

Based on the results of the present study the following suggestions must be done in order to conserve these important natural resources.

1. The native knowledge should be properly acknowledged and preserved.
2. The local population must be trained about the conservation and sustainable utilization of medicinally important flora.
3. Proper planning must be done in order to reduce overgrazing and deforestation with special focus on Insect population because plants found in the study area were not only medicinal but also provided best inhabitation for insect.
4. There should be implementation of laws and rules hence government must ensure in order to control illegal cutting and also for the conservation of forests because cutting causes degradation of natural resources.
5. Permanent monitoring programs should be launched.
6. Alternate fuel source should be provided to the population.
7. Appropriate health services should be provided to the community and knowledge.
8. Degraded land could be planted with the multipurpose species

9. Overgrazing is one the factor for medicinal plant degradation hence it should be banned in forest.

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