Research Article

Ethnobotanical study of flora of Gulistan, district Killa Abdullah, Balochistan, Pakistan

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Abstract

Ethnobotany is the study of diverse usage of plants by people, especially by indigenous community. Natives of Gulistan region of district Killa Abdullah, province Balochistan possess a wealthy culture and rich history of tribal society with regard to the usage of local plants. The residents use the plants for cooking, curing diseases, fuel, construction etc. This traditional knowledge has passed from generation to generation. The field survey and interview are the best ways to document their knowledge. In the present study a total of 35 wild and cultivated plants belonging to 20 families were compiled which were traditionally used by the community mostly for treatment of various ailments. Maximum number of species studied belongs to the family Rosaceae with 5 species, and the remaining families were represented by less than five species. The aims of ethnobotanical research activities in Balochistan were to provide awareness to the local community; overall global trend towards the indigenous knowledge, re-emergence and the transmission of knowledge has also been initiated. Traditional knowledge may be preserved and utilized in modern pharmaceutical industry and for conservation of plants.

Key words: Ethnobotany; Flora; Indigenous knowledge; Medicinal plants; Gulistan

Introduction

The term ethnobotany was introduced by an American botanist Johan W. Harshbergerin (1896) and it is the study of direct interaction of plant and human population [1]. The indigenous knowledge refers to the folk wisdom of the tribal and indigenous people based on accumulation of knowledge which is inherited in cultures and tribes from antiquity through trials and errors, not like

other knowledge which originates in research institutes [2]. In autochthonous societies the ethnobotanical knowledge is transferred from one generation to the other via personal experiences and oral communication [3]. The importance of ethnobotanical studies in Pakistan is prevailing with the passage of time due to resurgence of different novel and incurable diseases [4]. In Pakistan out of six thousand

plants, 600 plants have been classified as medicinal plants [5]. Up to 1950, 84% of Pakistani was dependent on indigenous medicines for health care and also most of their daily requirements were derived from indigenous practices, but now these are practiced only in specific remote areas [6]. Balochistan covers about 44% of the land area of Pakistan and is the largest province which is blessed with diverse fauna and flora along with versatile ecological conditions [7]. In the southern west areas of Balochistan 114 plant species were used for having medicinal properties [8]. In Balochistan the elderly women were observed to be an expert for usage of indigenous plants, as they knew the techniques of treatment for number of different ailments [9, 10]. The use of medicinal plants by local community against different diseases were as; jaundice, toothache, typhoid, kidney pain, hair fall, joints pain, edema, purification of blood, pimples, chest infections, insects and snake bites, high blood pressure, and diabetes [11]. Study conducted in protected area of Hingol National Park (Lasbela District, Balochistan) revealed that 39 plant species were used as remedies for different ailments

by local people [12]. The present study was carried out to explore the ethnobotanical knowledge of flora of Gulistan, district Killa Abdullah, Balochistan.

Materials and Methods

Study area

District Killa Abdullah is the 6th smallest district in Balochistan with an area of 3,293 km². It lies between 66°14'23"-67°15'43" east longitudes and 30°05'7"-31°18'46" north latitudes and consist of four Tehsils (Chaman, Dobandi, Gulistan and Killa Abdullah) and 25 Union Councils (Figure 1). Killa Abdullah is located at 690 km south-west of Pakistan's Capital City Islamabad and 70 km north from Quetta city (provincial capital of Balochistan). The climate of district Killa Abdullah is generally dry and temperate. The district lies outside the sphere of monsoon currents, so rainfall is irregular and insufficient. The climatic conditions of the district are particularly suitable for horticulture and agriculture, and especially suitable for the growth of fruits e.g. apples, apricots, peaches, plums, grapes, cherries and vegetables such as potatoes, onions and tomatoes [13].

Figure 1. Map of Pakistan showing Killa Abdullah Balochistan (District development profile, 2011)

Data collection

The study was carried out during the months of June-July 2014. The survey questionnaire was designed to collect data based on the knowledge of indigenous communities of the area for usage of different parts of plant species. About 100 informants of different age groups were selected randomly for interview (ranged between 18-80 years old). Majority of the informants were female due to their acquaintance to usage of medicinal plants rather than male. The plant samples were collected from different areas of the district and identification of these plant species was carried out with the help of flora of Pakistan [14-16]. The plants were arranged according to their local names,

families, part used and their respective usage by local communities [17].

Results

A total of 35 wild and cultivated plants belonging to 20 families were culled commonly used by the local communities of studied area for different purposes such as food, medicines and fodder for animals, fuel, construction and agriculture (Table 1). The dominating family was Rosaceae with 5 species, followed by Apiaceae with 4 species, Lamiaceae and Asteraceae with 3 species each, Amaryllidaceae, Cruciferae and Fabaceae respectively with 2 species each and the remaining families were represented by one species each.

Table 1. Detailed taxonomic account of plants with local name and indigenous usage

Botanical names	Local names	Family	Habits	Part uses	Uses
<i>Allium griffithianum</i>	Piyaz	Amaryllidaceae	Herb	Whole plant	Use as food, also used for treatment of jaundice. Bulb is heated and used for wounds and to treat pus.
<i>Allium sativum</i>	Wozha	Amaryllidaceae	Herb	Whole plant	Raw garlic is used to reduce arterial blood pressure and for treatment of diabetes.
<i>Amaranthus viridis</i>	Sarmakae	Amaranthaceae	Herb	Whole plant	Cook as vegetable.
<i>Avena sativa</i>	Jawari	Poaceae	Shrub	Whole plant	Fodder, seeds used for eating purpose.
<i>Berberis densifolia</i>	Korha	Berberidaceae	Herb	Whole plant	Used as a fuel.
<i>Cardaria pubescens</i>	Bushki	Cruciferae (Brassicaceae)	Herb	Whole plant	Cooking purpose.
<i>Carthamus tenuis</i>	Kondalie	Asteraceae	Herb	Whole plant	Plant is soaked in water and then drink to treat fever, also used for mosquitos' expulsion.
<i>Cerepedium quettens</i>	Tarkha	Asteraceae	Herb	Whole plant	Green leaves of plant are soaked or boiled in water for treatment of diabetes and for treatment of malaria fever. Used as fodder. Dried plant is used as fuel.
<i>Cousinia thomsonii</i>	Zoaz	Asteraceae	Herb	Whole plant	Used as fodder for animal. Used as a fuel, also used for roofing of huts.
<i>Cuminum cyminum</i>	Speena zeera	Apiaceae	Herb	Seeds	Used for treatment of urinary tract infection, warm effect, gastric disorder. Used by breast feeding mother to increase lactation. Used as condiment in cooking.

<i>Ephedra intermedia</i>	Oman	Ephedraceae	Herb	Whole plant	Stem is used as antiseptic, also used for relief of cough and healing of wounds. Plant is boiled in water and steam is given to the patients of pneumonia.
<i>Eucalyptus sideroxylon</i>	Walye	Myrtaceae	Tree	Whole plant	Used for fire purposes and roofing.
<i>Ficus carica</i>	Inzer	Moraceae	Tree	Fruits	Used as food, Dry fruits of fig boiled with milk and used for treatment of cough and liver problems.
<i>Foeniculum vulgare</i>	Khozha wallani	Apiaceae (Umbelliferae)	Shrub	Seeds	Used for gastric disorder. Decoction with other herbs is used for treatment of abdominal pain in children.
<i>Heloxylon griffithii</i>	Shorie	Chenopodiaceae	Herb	Whole plant	Used as fuel.
<i>Medicago sativa</i>	Shpishtie	Fabaceae	Herb	Whole plant	Used as fodder, cultivated dried plant is also used as fodder in winter.
<i>Mentha longifolia</i>	Shinshobie	Lamiaceae	Herb	Whole plant	Used to treat flu and have anti allergic effect / taken with yogurt to produce cooling effect.
<i>Mentha spicata</i>	Nana	Lamiaceae	Herb	Whole plant	Boil in water & cooled it and drink early in the morning to produce cooling effect in stomach.
<i>Papaver somniferum</i>	Taryak	Papaveraceae	Herb	Seeds, receptacle and latex	Receptacle of poppy is boil in water and used for cough and seeds mixed with sugar syrup is used for relief of children. Seeds soaked in water overnight than grinded with almonds mixed with milk and drink for cooling purposes.
<i>Peganum harmala</i>	Spallanae	Zygophyllaceae	Herb	Seed / leaves and branches	Seeds taken with water for gastric problems and heart burning.
<i>Phaseolus vulgaris</i>	Lobia	Fabaceae	Herb	Seeds	For cooking purpose
<i>Plantago major</i>	Bartang	Plantaginaceae	Herb	Seeds	Produce warm effect, seeds are cooked with water and sugar to treat flu and constipation. In combination with <i>Trachospermum</i> it is used to treat cough and bronchial problems.
<i>Polygonum arenastrum</i>	Zomae	Polygonaceae	Herb	Whole plant	Used as a fodder for animal, hut roofing/ as a fuel / used for floor compaction.
<i>Portulaca oleraceae</i>	Khulfa	Portulacaceae	Herb	Whole plant without roots	Cooked as vegetable.
<i>Prunus cultivar</i>	Santroza	Rosaceae	Tree	Fruits	Eating purpose, Ash is used to fertilize the land.
<i>Prunus domestica</i>	Plum	Rosaceae	Tree	Fruits	Eating purpose, Ash is used to fertilize the land.
<i>Prunus persica</i>	Zardaloo	Rosaceae	Tree	Fruits, leaves and branches	Leaves are used for fodder , Branches are used for fuel purposes and roofing, fruits are used for eating , Ash is used to fertilize the land.
<i>Punica granatum</i>	Anar	Lythraceae	Tree	Fruits, seeds	Used as fruit. Dried Peel is grinded and mixed with yogurt to treat dysentery.

<i>Pyrus malus</i>	Saib	Rosaceae	Tree	Fruits	Eating purpose, Ash is used to fertilize the land.
<i>Rosa indica</i>	Gulgulap	Rosaceae	Shrub	Mostly flowers	It has a cooling effect used in combination with other herbs to treat constipation and other gastric problems. Flowers of plants soaked in water to make gulkand. Rose water is used for clearing of eyes.
<i>Tamarixindica</i> var. <i>galica</i>	Ghza	Tamariaceae	Shrub	Whole plant	Used as fuel and for thatching and roofing.
<i>Teucrium stocksianum</i> var. <i>incanum</i>	Kalpura	Lamiaceae	Herb	Whole plant	Soak in water and drink for fever.
<i>Trachospermum ammi</i>	Spareki	Apiaceae	Herb	Mostly seeds are used	Produce warm effect. Used to cure liver disorder, lung, gastric disorder and for fever.
<i>Sisymbrium irio</i>	Khaksheer	Cruciferae (Brassicaceae)	Herb	Seeds	Produce cooling effect to treat stomach disorder, constipation. Also used for abdominal pain.
<i>Zosima absinthifolia</i>	Zonkaie	Apiaceae	Herb	Whole plant	Use as salad.

Discussion

Pakistan has been blessed with a variety of medicinal plants due to its diverse climatic conditions [18]. Balochistan province due to its inaccessibility and isolation for centuries provides sanctuary for indigenous habitat of some herbal plants. The present study

revealed that for majority of population of the studied areas, the whole plant used (51%) followed by seeds (23%), Fruits (15%), leaves/branches (5%) and flowers/receptacle and latex (3%) for the cure of different ailments (Figure 2 & 3).

Figure 2. Percentage of plant parts for multiple uses

The extract of *Punica granatum* is used for vomiting, nausea and for stomach upsets [19]. In Gulistan district, the fruits of this plant were used as food and dried peel has been grinded and mixed with yogurt to treat dysentery. The plant parts such as leaves and seeds of *Peganum hermala* are used for the treatment of asthma, cough, leg pain, gastric problem and heart diseases [20, 21]. Studies carried out in Kalat and Khuzdar areas revealed that the root extracts of *Berberis balochistanica* has been used for injury and joint pain. However, the women folks of

Killa Abdullah used decoction of the seeds of the same plant for flu, cough and bronchial disorders [22]. Similarly in Kalat and Khuzdar the seed extracts of *Zosimia absinthifolia* has been used to treat the thirst of children and throat problems while the local people of Gulistan used the leaves of this plant species as crouton.

The seeds of *Cuminum cyminum* were used for sanative of urinary tract infection, warm effect, and gastric disorder and also used by breast feeding mother to increase lactation [23].

Figure 3. Some examples of medicinal plants collected from studied areas of Balochistan (A: *Carthamus tenius*, B: *Cousinia thomsonii*, C: *Ephedra intermedia*, D: *Ficus carica*, E: *Foeniculum vulgare*, F: *Peganum hermala*, G: *Plantago major*, H: *Polygonum arenastrum*, I: *Portulaca oleraceae*, J: *Tamarix indica* var. *galica*, K: *Teucrium stocksianum*, L: *Zosima absinthifolia*)

Conclusions

It is concluded that Gulistan area has been observed as rich in its indigenous knowledge for the use of local plants. The plants were used for various purposes like treatment of diseases, fuel and construction. The plant species can be utilized for uplifting the economic constrains of the study area when utilized in a proper manner and can be commercialized to provide benefits to the local community and also to other concern groups. The traditional knowledge of local plant species help to explore new avenues for researchers to study these important plants and investigate them. For sustainable usage and long term conservation of natural resources of the study area, it is opt to carry out frequent surveys and the consent of local people in evaluation, planning, implementation and monitoring process. The consumption of medicinal plants would raise the importance of the local industry and will also reduce the expenditure incurred on the purchase of foreign drugs.

Authors' contributions

Conceived and designed the experiments: PS Jan, B Sadia & N Sajjad, Performed the experiments: PS Jan & A Yousaf, Analyzed the data: PS Jan, B Sadia & B Tahira, Contributed reagents/ materials/ analysis tools: PS Jan, B Sadia, N Naz, S Hameed & N Rehmat, Wrote the paper: PS Jan, ZA Bazai & B Sadia.

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