



Medicinally important wild plants of district Harnai and adjacent areas of Balochistan

Muhammad Yousuf Tareen¹, Saeed-Ur-Rehman Kakar¹, Shazia Saeed¹, Abdul Rauf Tareen², Tariq Ismail^{1,3*}, Zsolt Ponya³

¹*Department of Botany University of Balochistan, Quetta, Pakistan*

²*Quaid-e-Azam University, Islamabad, Pakistan*

³*Department of plant protection and production, Kaposvar University, Pakistan*

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Abstract

Medicinal plants are known to be the primary health care of any rural community for being economical, having high efficacy, easy availability with no side effects. The aim of this study was to explore the medicinal flora of district Harnai and its adjacent areas. The current study is of significance, as these plants of district Harnai have not been reported by anyone. The total number of wild medicinal plants reported in this research study is 33, with 32 genera and 33 species. District Harnai is one of the biggest reservoirs of coal in Pakistan, the people there are suffering from airborne and water borne diseases due to the accumulation of coal which makes the role of medicinal plants very important. The data was collected by interviewing the local populace. A total of 150 interviews were carried out, 80 of which were men, 60 women and 10 were the traditional healers. The result of this research reveals that a considerable number of population is still dependent on the medicinal plants rather than using modern medication and these wild medicinal plants have a novel therapeutic effect in the treatment against various ailments.

* **Corresponding Author:** Tariq Ismail ✉ tariq.ismail@ke.hu

Introduction

The relationship between people and plants, also called as 'Ethnobotany', is a vital relation which dates back to the beginning of time and is still intact as the developed countries depend on these plants for formulation of modern medication. Meanwhile, people of the underdeveloped countries, especially in the rural areas are directly dependent on these plants for their primary health care for various diseases and health disorders because of its easy availability, effectiveness and no side effects.

Utilization of plants by man dates back to the origin of life. In the very beginning, plants were used only as food, but slowly man explored the plants for its many medicinal and potential purposes (Ali *et al.*, 2003; Ali, 2003). Medicinal plants have its vital role in the modern medication. An average of 467000 tons of medicinal plants have been traded every year globally from 1991-2003, worth of 1.2 billion US dollars (Lange, 2006).

The land of Pakistan is distributed into 9 Ecological zones with a unique biodiversity. The flora of Pakistan comprises of 6000 plants, about 400-600 of them are believed to be medicinally important (Hamayun *et al.*, 2005). Around the globe, there are 258650 species of higher plants, out of which only 10% of these plants are the medicinal ones, which are utilized to treat various diseases and ailments (Shinwari, 2010).

A total number of 1572 genera and 5521 species have been identified in Pakistan (Ali, 2008). Due to expensive allopathic medicine, and non-availability of primary health care services in rural areas, the people are compelled to utilize the medicinal plants. Probably 35000-70000 species are used in folk medicine globally (Lewington, 1990; Fransworth and Soejarto, 1991).

Approximately 80% of the people around the globe are dependent on the medicines based on medicinal plants for their primary health care as these pharmaceuticals obtained from plants are cheap, very effective, easily accessible, and have no side effects

unlike modern medication (Mukherjee and Wahile, 2006). Most of the population of Pakistan depends on medicinal plants for minor ailments, sometimes even for major ones.

Those plants which are bioactive, are used in treating human and animals. The modern medicine is based on the very same medicinal plants, the famous medicines like Aspirin, Morphine and Reserpine are developed from medicinal plants with the help of indigenous knowledge (Shinwari, 2010).

Various medicinal plants are known to have economical and nutritional value because of being antioxidants. These wild medicinal plants are becoming as a prime source of floral diversity, conservation, and advancement of indigenous communities (Maikhuri *et al.*, 2004). Due to its vitality and a source of food, these plants have been intensively explored, especially in the food insecure areas of greater Himalayas (Nahar *et al.*, 1990).

These medicinal plants can be a prime constituent of diet of the indigenous people as they are the active source of nutrition and food (Hummer, 1996 & 2010; Kalkman, 2004).

The wild plants limited to hilly areas of Pakistan played the prime role in biodiversity and offered a strengthened relation between plants and man. The local inhabitants have been obtaining their livelihood from these plants by adopting livestock, sericulture and apiculture. The poverty ridden communities always collected, processed and used these medicinal plants (Nadeem *et al* 2013).

Geography and climate

The research was pursued in district Harnai, which is the 3rd smallest district of Balochistan. Earlier, Harnai was the tehsil of district Sibi. In August 2007, it was upgraded to the status of district which now has 2 tehsils (Harnai and Shahrag) and 9 union councils (Harnai Sadar 1, Harnai Sadar 2, Nakas 1, Nakas 2(Sazoo), Zarghoon, Babian, Shahrag, Khost, and

Spintangai). The 95% population of Harnai is Tareen, and rest of the 5% includes Syed and Marri.

The people of Harnai speak a very unique dialect of

Pashto, "Tareeno", which is thought to be the ancient & pure form of Pashto with no intermingling of words of other languages, the language is spoken and understood within the district only.

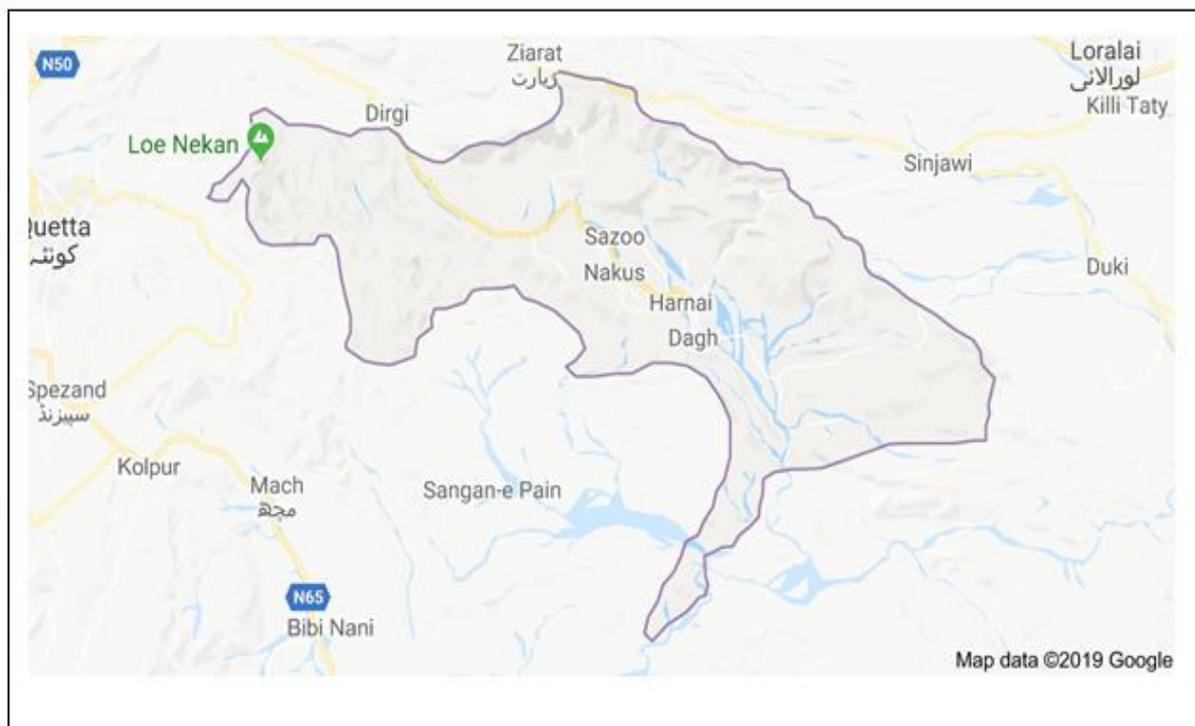


Fig. 1. Google map of district Harnai.

District Harnai has an area of 3,075 square kilometers, and has mountainous region, Khalifat and Zarghoon. The district lies between Ziarat, Loralai and the provincial capital Quetta.

The coordinates of district Harnai are 30.105447°N, 67.939861°E. The temperature in winter is around -2°C to 20°C and the summer is extremely hot, ranging from 20°C to 48°C. It has fertile rains during the monsoon, and it is one of the beautiful places in Balochistan with plenty of water in streams. The agriculture in Harnai is carried out with the stream water, there are no bores installed for agriculture. According to the 2017 census, it has a population of 97,017.

Material and methods

The data of medicinal plants was collected by different means like, questionnaires, interviews and field trips during March 2018 to February 2019. The

plant specimens were collected during their fruiting and flowering stage and the specimens collected were herbs, shrubs and trees.

The specimen were then pressed, dried and mounted on a standard herbarium sheet measuring 11.5" to 16.5" following the herbarium techniques of Jain and Rao (1977). The identification was carried out through consulting (www.theplantlist.org), and flora of Pakistan (Ali and Nasir, 1989-1981).

The specimens were then banked in the herbarium of University of Balochistan.

Interviews

The interviews were conducted with the help of the local populace. The interview consisted of 150 Informants, including 80 men, 60 women and 10 herbalists. The women of district Harnai keep the code and conduct of tribal affairs, so it was difficult to

interview them, therefore, the services of a female volunteer was hired.

Family percentage

The most prominent family was Lamiaceae (12%), followed by Apocynaceae (9%) and Moraceae (9%) with 3 species each, Asteraceae (6%), Rhamnaceae (6%) and Euphorbiaceae (6%) with 2 species each and rest of the families contributed only 1 species each.

Photography

During all the field trips, survey and interviews, a digital camera was used to picturize the medicinal plants and the interviewed informants. Photos were also taken which showed specific parts of the plants.

District Harnai and adjacent areas were also photographed showing habit of the medicinal plants as well. The local community and the herbalists were also photographed.

Results and discussion

The field of Ethnobotany is very vast, and numerous research studies have been reported about the areas of Pakistan having medicinal flora.

This research is one of a kind as the medicinal plants of district Harnai enlisted here have not been reported earlier.

Table 1. Medicinal plants used for different health disorders.

Botanical name	Family	Local name	Part used	Uses	Formulation	Mode of application
<i>Achillea wilhelmsii</i> C.Koch	Asteraceae	Zawal	Whole plant	Anti-malarial& wounds	Decoction	Oral & dermal
<i>Berberis lycium</i> Royle.	Berberidaceae	Zarlag	Leaves, seeds & roots	Body pain vomiting	Decoction	Oral
<i>Calotropis procera</i> Aiton	Apocynaceae	Spalma	Latex	Snake & insect bite	Decoction & paste	Dermal
<i>Caralluma tuberculata</i> N.E. Br.	Asclepiadaceae	Pamani	Whole plant	Anti-diabetic	Juice	Oral
<i>Chenopodium botrys</i> L.	Chenopodiaceae	Sarma	Whole plant	Anti-septic & insect bite	Decoction	Oral
<i>Citrullus colocynthis</i> L.	Cucurbitaceae	Krayree	Fruit & seeds	Hemorrhoids &anti-diabetic	Powder	Oral & dermal
<i>Dalbergia sissoo</i> Roxb.	Fabaceae	Zghar	Roots, leaves & wood	Body wounds	Powder	Dermal
<i>Dodonaea viscosa</i> Jacq.	Sapindaceae	Gasani	Leaves and bark	Infection & wounds	Decoction & paste	Oral & dermal
<i>Ephedra intermedia</i> Schrenk & Meyer	Ephedraceae	Uman	Branches and leaves	Fever	Decoction & paste	Steam & dermal
<i>Eucalyptus camaldulensis</i> Dehnh.	Myrtaceae	Angrezi Waza	Leaves	Flavoring agent & toothache	Raw	Oral
<i>Euphorbia heliscopia</i> L.	Euphorbiaceae	Zaar	Whole plant	Skin eruptions	Latex	Dermal
<i>Ficus carica</i> L.	Moraceae	Inzar	Fruit & leaves	Anti-hemorrhoid	Raw	Oral
<i>Foeniculum vulgare</i> Mill.	Apiaceae	Khwazah Walani	Fruit	Digestion & flavoring agent	Decoction	Oral
<i>Juniperus excelsa</i> M. Bieb.	Cupressaceae	Orbashta	Fruit & bark	Diarrhea & toothache	Gum	Oral
<i>Melia azedarach</i> L.	Meliaceae	Zhari Danay	Seeds & fruit	Anthelmintic	Oil & powder	Oral
<i>Morus alba</i> L.	Moraceae	Toot	Leaves, seeds & fruit	Digestion & anti-fever	Raw	Oral
<i>Morus nigra</i> L.	Moraceae	Shah Toot	Bark, leaves & fruit	Used for skin irritation	Raw	Oral
<i>Nannorrhops ritchieana</i> (Griff.) Aitch.	Arecaceae	Marzi	Fruit & leaves	Tonic and dysentery	Raw & decoction	Oral
<i>Nepeta praetervisa</i> Rech. F.	Lamiaceae	Chamjan Bota	Leaves	Flue, fever & infection	Decoction	Oral
<i>Nerium oleander</i> L.	Apocynaceae	Gandair	Leaves	Leprosy, itching & skin worms	Decoction	Dermal
<i>Olea ferruginea</i> Royle.	Oleaceae	Shawan	Leaves, fruit & latex	Liver pain, flue & cough	Raw	Oral
<i>Pistacia khinjuk</i> Stocks.	Anacardiaceae	Shna	Gum, fruit & leaves	Digestion & Diarrhea	Decoction & oil	Oral
<i>Plantago major</i> L.	Plantaginaceae	Polar Pana	Seeds, leaves & roots	Pain & wounds	Decoction & paste	Oral & dermal
<i>Rhazya stricta</i> Decne.	Apocynaceae	Rangobala	Whole plant	Intestinal worms	Decoction & powder	Oral & dermal
<i>Ricinus communis</i> L.	Euphorbiaceae	Arand	Seeds	Insect bite & body pain	Oil	Dermal
<i>Salvadora oleoides</i> Decne.	Salvadoraceae	Miswak	Fruit, leaves and roots	Kidney & bladder stones	Raw	Oral & dermal
<i>Salvia bucharia</i> Popov	Lamiaceae	Sursanda	Flowers	BP& digestive disorders	Decoction	Oral
<i>Teucrium stocksianum</i> Boiss.	Lamiaceae	Karpola	Whole plant	Jaundice, Typhoid & fever	Decoction	Oral
<i>Vitex negundo</i> L.	Lamiaceae	Mirwandi	Leaves & fruit	Anti-asthmatic & tea	Paste & powder	Oral
<i>Withania coagulans</i> Stocks. Dunal	Solanaceae	Khamazuri	Seeds & leaves	Gastric disorders & pimples	Decoction & raw	Oral
<i>Xanthium strumarium</i> L.	Asteraceae	Kundur	Whole plant	Anti-cancer & anti-malarial	Decoction & powder	Oral
<i>Ziziphus jujube</i> Mill.	Rhamnaceae	Baira	Leaves, bark & seed	Diarrhea & hair growth	Paste	Oral & epithelial
<i>Ziziphus nummularia</i> Burm.f. Wight & arn	Rhamnaceae	Karkar	Leaves & seeds	Hair loss, diarrhea & diabetes	Decoction	Oral & epithelial

The research study showed that a total of 33 plant species belonging to 32 families were recorded in district Harnai. Among these, the number of herbs were 12, shrubs 11 and trees were 10. The highest

number of species were of family Lamiaceae. Leaves were the maximum used part followed by fruit and seeds, while decoction was the prime method of herbal formulation.

Table 2. Demography of informants.

Sr. No	Variables	Category	No. of persons	Percentage (%)
1	Informant category	Herbalist	10	7
		Local people	140	93
2	Gender	Male	90	60
		Female	60	40
3	Age	30-40	20	13
		40-50	55	37
		50-60	55	37
		60-80	20	13
4	Educational background	Literate	35	23
		Illiterate	115	77
5	Experience of herbalists	10-20 Years	8	80
		20-40 Years	2	20

In this survey, a total number of 150 informants were interviewed, 90 of which were men (60%) including herbalists, 60 women (40%). The herbalists (6.6%)

and the informants ranging from 40-60 had more valuable knowledge about Medicinal plants.

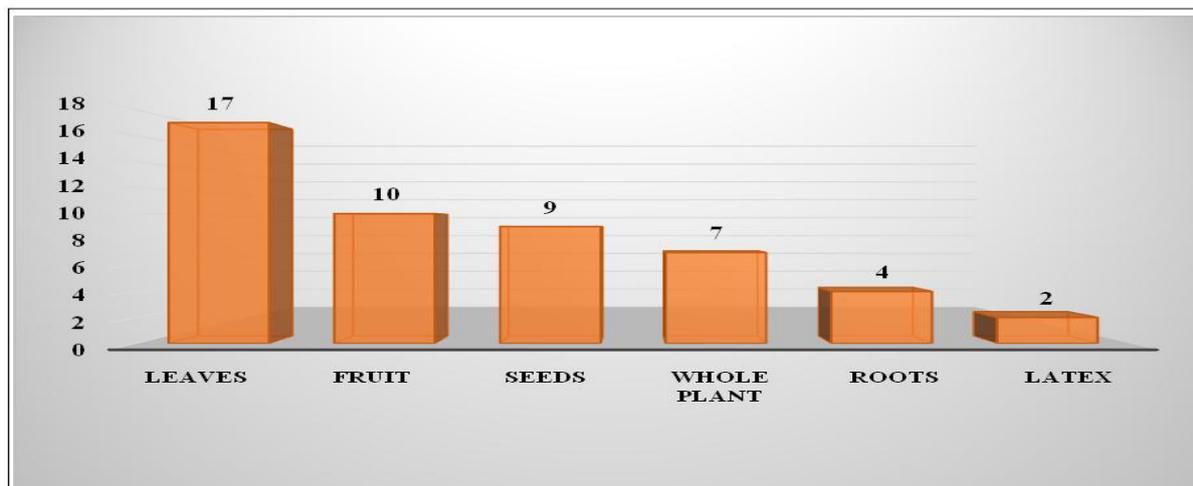


Fig. 2. Plant parts used are multiple for each plant, the values are as under.

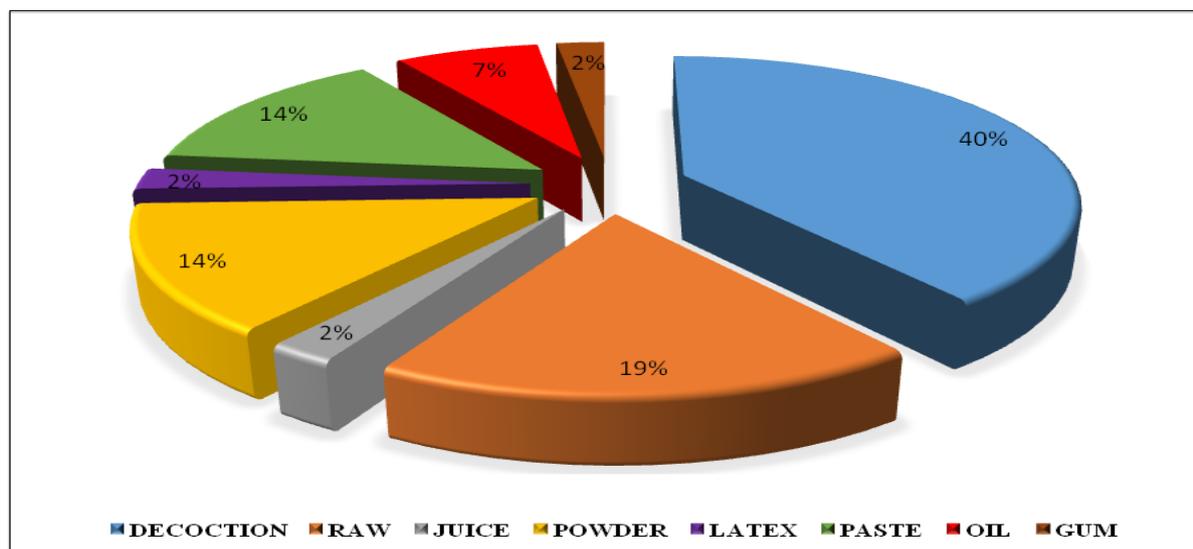


Fig. 3. Percentage of herbal formulation.

Conclusion

The current research reported the floral diversity of district Harnai, Balochistan. According to the findings of this research, the indigenous people are still dependent on the local medicinal flora rather than modern medication, as the district is remote from the metropolitan city and lacks many facilities, so they have to rely on medicinal plants. The common utilization of medicinal plants in this area is for digestive disorder, insect & snake bite, diabetes, body pain and diarrhea. The research has helped to conserve the indigenous knowledge of the district about its medicinal plants by documenting it thoroughly. Which will help in exploring option for new research dimension in future.

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