Journal of Ethnopharmacology 157 (2014) 79–89

Contents lists available at ScienceDirect

Journal of Ethnopharmacology

journal homepage: www.elsevier.com/locate/jep

Research Paper

Ethnobotany of medicinal plants in district Mastung of Balochistan province-Pakistan

Tahira Bibi [a,b], Mushtaq Ahmad [a,*], Rsool Bakhsh Tareen [c], Niaz Mohammad Tareen [c,d], Rukhsana Jabeen [b], Saeed-Ur Rehman [c], Shazia Sultana [a], Muhammad Zafar [a], Ghulam Yaseen [a]

[a] Department of Plant Sciences, Quaid-i-Azam University Islmabd, Pakistan
[b] Department of Plant Sciences, Sardar Bahadur Khan Women's University Quetta, Pakistan
[c] Department of Botany, University of Balochistan Quetta, Pakistan
[d] Bureau of Curriculum and Extension Centre Quetta, Pakistan

ARTICLE INFO

Article history:
Received 13 July 2014
Received in revised form
24 August 2014
Accepted 29 August 2014
Available online 23 September 2014

Keywords:
Ethnobotany
Medicinal plants
Mastung
Baluchistan
Pakistan

ABSTRACT

Ethnopharmacological relevance: The aim of this study was to document the medicinal uses of plants in district Mastung of Balochistan province, Pakistan. The ethnobotanical results contain quantitative information on medicinal plants diversity documented for the first time in the area.
Materials and methods: The information was collected through semi-structured interviews, rapid appraisal approach, open ended questionnaire and personal observations. Results were analyzed using quantitative indices of information consent factor (ICF), fidelity level (FL), use value (UV), frequency citation (FC) and relative frequency citation (RFC).
Results: In total of 102 plant species belonging to 47 families were reported for the medicinal purposes. Asteraceae was found to be dominant family in terms of species in the area with 11 species. The whole plant and leaves were noted as most frequently used parts (24%). Decoction (31% with 40 species) was the most commonly used preparation method. Highest ICF value (1) was recorded for antidote category. 100% fidelity level was found for four plant species i.e. *Achillea welhemsii, Caralluma tuberculata*, *Citrullus colocynthis*, and *Seripidium quettense*. The highest use value was reported for the *Acroptilon repens* (0.5) while highest RFC value was calculated for *Berberis balochistanica* and *Citrullus colocynthis* (0.18). Highest use report was calculated for *Caralluma tuberculata*, *Citrullus colocynthis*, *Malva neglecta* and *Mentha longifolia* with five use reports for each.
Conclusions: The area is rich in medicinal plants and these plants are still commonly used for medicinal purposes among the people in their daily lives. However, there is a gradual loss of traditional knowledge about these plants in new generation. This study provides basis for the conservation of the local flora, its use as food and medicine. It also provides various socio-economic dimensions associated with the common people.

1. Introduction

Various pathological conditions in human being that could not be fully treated by conventional pharmaceutical are numerous (Redžić, 2007). For this reason, there is a growing tendency in use of herbal preparations. Almost 80% of the world's population depends on plants remedies for its primary health care needs (Ullah et al., 2010). The local people of the rural areas have good knowledge about the uses of plants and they prefer medicinal plants due to their easy availability and cheap therapy as compared to costly pharmaceuticals. Inhabitants of the remote areas have discovered the therapeutic activity of medicinal plants against certain diseases through their indigenous experiences (Qureshi, 2004). Number of studies have been carried out from the world on medicinal uses of plants among various indigenous communities (Kargoglu et al., 2008; Ratnam and Raju, 2008; Jamila and Mostafa, 2014). In neighboring countries of Pakistan, remarkable ethnobotanical work has been done in the past (Safa et al., 2012; Nasab and Khosravi, 2014; Singh et al., 2014). While in all these studies qualitative approaches have been adapted to document ethnobotanical information (Hamayun et al., 2005; Sadeghi et al., 2014). In Pakistan ethnobotany is getting matured with the passage of time and various studies have been reported from various parts of the

* Corresponding author. Tel.: +92 51 9064 3149; fax: +92 51 9064 3138.
E-mail address: mushtaqflora@hotmail.com (M. Ahmad).

http://dx.doi.org/10.1016/j.jep.2014.08.042
0378-8741/

country (Bhatti et al., 2001; Qureshi, 2002; Khan and Khatoon, 2004; Qureshi and Bhatti, 2008, 2009; Qureshi et al., 2009; Shinwari, 2010; Farooq et al., 2012; Bahadur, 2012, Abbasi, et al., 2013 ; Ahmad et al., 2014). While in contrast, ethnobotanical research has been somewhat neglected in the Southwestern Pakistan generally and Balochistan province particularly. It is the largest province of the country in terms of area, constituting approximately 44% of the country's total land mass, and the smallest in terms of population, being home to less than 5% of the country's population.

In Balochistan, few studies were carried out by some scholars in the past like Shinwari and Malik (1989) conducted a research on ethnobotanical wealth of Dera Bughti area; Goodman and Ghafoor (1992) investigated the ethnobotany of Southern Balochistan, with particular reference to medicinal plants, Leporatti and Lattanzi (1994) reported traditional phytotherapy on coastal area of Makran, Shah et al. (2006) carried out an ethtnobotanical studies of the flora of district Musakhel and Barkhan in Balochistan, Tareen et al. (2010) reported the indigenous knowledge of folk medicines by the women of Kalat and Khuzdar regions of Balochistan, Qureshi (2012) reported medicinal flora of Hingol National Park, Baluchistan, Manzoor, et al. (2013) reported the uses of fruits, vegetables and herbs for the treatment of diabetes by the people of Quetta city, but in all these studies no quantitative ethnobotanical work has been undertaken in this province generally and District Mastung particularly.

The study area has never been explored before ethnobotanically, and in this regard the present study can be considered as the first one which deals with an ethnobotanical study on medicinal plants in this region. District Mastung has also got importance for its topography as well, having high Sulaiman Mountains, with desert and forest habitats and having rich diversity of medicinal plants. The rural areas of the district still depend on these wild plants for the cure of diseases and having a good ethnobotanical knowledge about medicinal plants. But currently the ethnobotanical knowledge is disappearing very fast from the urban areas of the district because of being closer to and bounded with the capital city of province 'Quetta' having health and other facilities. Due to this, it was felt worthwhile to record the folk knowledge of medicinal plants used by the inhabitants of District Mastung. The aim of this study was to document ethnomedicinal uses of plants and analyzed ethnobotnaical information using quantitative indices of information consent factor (ICF), fidelity level (FL), use value (UV), frequency citation (FC) and relative frequency citation (RFC).

2. Material and methods

2.1. District Mastung geo-ethnographical overview

District Mastung is bounded on the north by Quetta district. The Hazar Gangi Chiltan National Park is located between Quetta and Mastung. The Park is about 20 km southwest of the city of Quetta which is a valuable conserved area of Balochistan. The total area of district is 4734 km^2. While the alleviation varies from 5600 to 10,000 feet above the sea level. It lies between north latitudes 28° 57′ and 30° 8′ and East longitudes 66° 14′ and 67° 31′ (Anon, 1997) (Fig. 1).

The local language brahui is used primarily in speech. Particularly, we find a large brahui population in the District. Other ethnic groups are Urdu, Balochi, Dehwari, Hindko, and Sindhi. All ethnic groups residing in the district commonly speak Urdu with each other for communication. Some of the tribal people annually migrate during winter with their families and small ruminants towards Kachi (Bolan District) Jacobabad and Larkana. Migration to other countries is very limited representing only 17.7% of all migrants. Migration starts in October and continues till November. The migrants return again to Mastung in March (Anon, 1997).

2.2. Socio-economic conditions of the area

The district Mastung has been blessed with diverse flora including a great number of medicinal plants. The rural areas of the district are still dependent on medicinal plants for their health care because of lack of health centers in the area. Agriculture is the major earning means of the people in the region. Nearly 50% of the population of Mastung depends on agriculture. Important cultivated plants are wheat, barley, cumin, fodder, melon, potato and other vegetables. Some of the local inhabitants collect medicinal plants from forests, deserts, mountains and plains and sell them to the local traditional herb sellers in very cheap prices. Local traditional herb sellers then supply these plants to the pharmaceutical companies in good prices. If the sustainable use of wild flora and cultivation of medicinal plants are promoted in the area, this will strongly affect on the socio-economic condition of the local inhabitants.

2.3. Field interviews

Ethnobotanical data was collected through free listing interviews with randomly selected informants and field interviews with key informants selected after free listing (Ghorbani et al., 2011). The questionnaire was mainly focused on the ethnobotanical claims and traditional believes of local communities and nearby people. The interviews were conducted using the local languages that are *Brahui and Urdu*, as the first author is a local person of the region. For the ethnomedicinal information, a total of 220 inhabitants of the area were interviewed. 110 women, 90 men and 20 men traditional healers were interviewed. The informants were divided into three different age groups i.e. 21–40, 41–60 and 61–80 years old. All informal meetings were held in 11 different villages of the district i.e. Dasht, Punchpai, Mastung City, Kanak, Khad Khoocha, Sungur, Pringabad, Kardigap, Sheikh Wasil, Spezand, Kaneti and Dreangarh.

2.4. Collection, identification and deposition of medicinal plants

The plants were collected during (2012–2014) in district Mastung covering almost all the seasons of the year and from all the parts of district including deserts like Dashte Khooni, Bhalla Dasht; Tamarix forest, Sulaiman Mountains and plains. The collected plant specimens were dried and preserved processed as per routine herbarium techniques recommended by Jain and Rao (1977). For reconfirmation of plants identification, the Flora of Pakistan Nasir and Ali (1970-1979), Nasir and Ali (1980-1989), Ali and Nasir, 1989–1991 and Ali and Qaiser (1993-2007) have been consulted. Voucher specimens were deposited in the herbarium of Department of Botany University of Balochistan Quetta.

2.5. Quantitative analysis of ethnobotanical results

The data collected was analyzed using quantitative value indices.

2.5.1. Informant consensus factor (ICF)

Informant consensus factor (ICF) was obtained (Trotter and Logan, 1986; Heinrich et al., 1998) using the following formula:

$$ICF = (N_{ur} - N_t)/(N_{ur} - 1)$$

where N_{ur} refers to the total number of use reports for each disease category and N_t is the number of taxa used in that category. It is used to test the homogeneity of knowledge on the use of species in the illness categories between the populations. The ICF provides a range of (0–1). High ICF shows that there is a narrow well-defined group of species used to cure a particular ailment category and/or that information is exchanged between informants and low ICF values (close to zero) indicate that informants disagree over which plant to