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REVIEW ARTICLE

Medicinal Plants Diversity and its Indigenous use in Pakistan

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Abstract

Pakistan has a lot of diversity in the medicinal plants. More than 50% of the medicines used today in daily life are taken from plants source. According to WHO 80% of the population of the world use the traditional medicinal plants for their health care needs. People living in the different provinces namely Punjab, Sind, Khyber Pakhtunkhwa, Baluchistan an Kashmir are dependent o these natural resource (Plants) for their daily life use of food, medicine, vegetable, fodder, feulwood, timber and religious purposes. About 75% of the total population villages and rural areas of the country depends on the traditional indigenous medicine. The indigenous knowledge of the medicinal plants is the rich source of the important medicinal plants knowledge and the elderly people are mostly more aware of the indigenous use of these medicinal plants.

Introduction

Medicinal Plants Diversity in Pakistan

Pakistan is located on the North Western side of South Asia. It lies between 24° and 37° North and longitude 61° and 78° East. The total area of Pakistan is about 7, 93, 000 square km and it is the second largest nation in South Asia, India being the largest (Bano et al., 1995).

Pakistan has a rich and varied flora. There are about 4940 native plant species of the flowering plants found in different kinds of habitats from seashore, deserts to the mountainous areas to the North. These include 372 endemic species, mostly found in the northern and western mountainous regions of Pakistan. (Nasir & Rafiq 1995).

Medicinal plants are mostly used in health care products in traditional medicine. These are also used as the raw material for the pharmaceutical industry for getting the fixed oils, essential oils, gums, tannins, resins, and active constituents like glycosides, flavonoids, alkaloids, culinary spices, natural cosmetics and also in perfumes.

It is for centuries that humans are extracting, processing and using medicinal plants in their daily life, for their economic benefits and uplift of local community and for the animals use (Ahmed, 1999; Khan, 1951). The medicinal plants found in the Himalayan region are very specific (Dhar *et al*., 2000). In Pakistan Northern areas are the main source of the medicinal plants from where these plants are sold in the other areas of the country including the other provinces and exported to other countries abroad. In addition of the local community the main users of the medicinal plants are the allopathic and herbal medicines industry. People living in the mountainous areas of Pakistan commonly use plants in different ways e.g. food, medicines, fodder, fire wood and timber wood. (Hussain & Khaliq, 1996).

According to surveys by Pakistan Forest Institute (1989), 500 tons of medicinal plants are produced in Malakand and Hazara, 16 tons in the Murree, 38 tons in (AJK) Azad Kashmir and 24 tons in the Northern Areas of Pakistan. Mostly these plants are being collected from wild forest. Then they are dried, processed and sold in the market or exported abroad to other countries. Pakistan gets more than 80 % of

its medicine needs from plants. Most of the people in our country depend on medicinal plants for treatment of their minor or major diseases. Some wild medicinal plants are commonly used as ethnomedicine by the local community e.g. *Geranium wallichianum, Berberis lycium, Hippophae rhamnoides, Podophylum hexandrum, Peoni emodi* etc.

Chevallier (1998) described that Medicinal plants have active chemical constituent in any of its part like roots, stems, leaves, barks and seeds, that response in the treatment of various ailments in human and other animals. The traditional healers (herbal practioner) plays very important role in giving health coverage up to 75% of the people (population) living in rural areas. Many herbal products are used by the herbal healers for the treatments of many diseases common in an area. The elder people of the area, even in these days, use local plant resources to cure many common diseases of children especially. The experience and knowledge of the senior (elderly) people (both men & women) is a very precious wealth of an area.

Islamabad has a hotspot of medicinal plants diversity i.e. Margalla National Park having a lot of medicinal and economically important plants. A lot of work is done in this area and still there is a lot of potential for the botanists and researchers. There is a local market system called Pansar / Herbal healers which specifically deals with medicinal plants business in Pakistan. Many important medicinal plants including fungi are exported in Europe and America for making the Allopathic, Herbal and Homeopathic medicines. The active constituents of the medicinal plants are commonly used to treat many ailments or disorders in both human beings and animal. In most cases certain plant are specific in the treatment of a specific disease or illness but sometimes they have mixed usage. The collection of medicinal plants is mostly done by local Women and children of the targeted area.

Shinwari & Khan (2000) described the traditional usage and the conservational status of 160 medicinal plants described form the Margalla Hills National Park. It was also found that in the recent times; a lot of efforts are made to document and use the local traditional knowledge about medicinal plants. Khan *et al.,* (2011) reported the antimicrobial activities of the crude methanolic extracts of different plant parts of 13 selected medicinal plants namely from Margalla Hills Islamabad. The medicinal plants mainly included *Adhatoda vasica*, *Broussonetia papyrifera*, *Woodfordia fruiticosa*, *Vitex negundo*, *Taraxacum officinale*, *etc.*

Khan *et.al.,* (2011) described the quantitative and qualitative analysis of the main bioactive constituents of 13 important medicinal plants from Margalla Hills and Surroundings namely The detailed phytochemical analysis of these plants was also performed for the alkaloids, saponins, anthraquinones, tannins, flavons, flavonols, flavonoids, and terpenoids, chalcones, phlobatanins, steroids, cardiac glycosoides and coumarins.

World Market of Medicinal Plants.

S/No	Countries	Retail (Million $)
1	European Union	6,000
2	Rest of Europe	500
3	Asia	2,300
4	Japan	2,100
5	North America	1,500
	Total	**Total 12,400**

Source: Brevoort, P. "The current Medical & Dietary Uses of Botanicals: A market perspective" in July 1996 USP Open Conference

Drug Regulatory Authority Bill 2012

The drug regulatory authority bill was approved by President Asif Zardari on Nov. 13, 2012. This was passed as law to avoid the fake sale of non-registered and sub-standard medicines and to stop hoarding. Drug Regulatory Authority would help to legalize and regulate the manufacturing, distribution, storage, sale, and import of drugs.

This law would help to make possible the availability of quality and safe medical services at reasonable and affordable prices for the people and would also protect the interests of the common people and that of the pharmaceutical industry in the country. (The Nation, 2012).

Ethnobotanical / Traditional knowledge Dissemination/Transmission.

The traditional knowledge must be highly systematized rather than on a small scale or localized so that this knowledge must not remain secret to limited selected persons but disseminated and transmitted to general public and the society at large.

WHO reported in its report in 2011 i.e. approximately 70-95 % citizens in the developing countries use traditional medicine for the basic health care. This ratio is also nearly same to the developed countries because of affordability, easily availability and cheap price of the traditional medicine in comparison to the allopathic medicine.

On the basis of the methods used for the healing/maintaining health, therapies used in

traditional medicine can be differentiated into medicated therapies (using herbal medicine or medicine based on animal parts or minerals), non-medicated therapies (e.g. massages, meditation, magic-religious or yoga etc.) and mixed therapies combining the above both.

Ethnobotany and Traditional Indigenous Use of Medicinal Plants in Pakistan

It is the study of the way how people of a specific regions and culture use the indigenous plants, while the ethnobotanist explores the ways how the indigenous people use these plants for medicine, food, shelter, clothing, religious ceremonies and hunting etc. Ethnobotany is the study of the relationship between a society and its environment especially the plant world (Aumeeruddy, 1996).

Indigenous (local) knowledge is as old as human civilization but the term ethnobotany was first used by Harshburger (1896) who was an American botanist. After that the Ethnobotany is widely used as very important part of Botany and people are using this field for the benefit of the mankind. People living in the forest are mostly dependent on the floral diversity in the form of medicinal plants for their food and medicine. Warren (1990) described that Hundreds of ethnic groups inhabit the big mountainous region in world with their specific cultural traditions for the use of biological resources. This indigenous knowledge is now under pressure of extinction and may disappear forever.

The problem with the collection and use of the medicinal plants is due to lack of proper scientific knowledge and information about the plants useable parts, proper time and method of collection. This practice leads to the misuse of plants. The proper collection timing of desired and required part of plant normally determines the correct yield, quality and percentage of the active ingredients of these medicinal plants (Adnan *et al.,* 2003).

Herbal medicine plays a vital role in the rural areas. Many locally produce drugs are still used by the local people as household remedies for the treatment of many diseases and also for the cure of various ailments (Qureshi & Ghufran, 2005).

Farooq (1990) reviewed the medicinal plants of Pakistan. He reported Fifty-two species of indigenous medicinal plants from 25 families of angiosperms. These plants have their importance in the traditional medicine of Pakistan and India. Ahmad (2008) documented the medicinal uses of plants used by local people of salt range (Kalar Kahar) and also reported the data on 29 medicinal plant species belonging to 18 families. These plants were used to cure the common disorders such as cold, cough, diarrhea and fever. The poor people are unable to afford the expensive synthetic drugs so the indigenous knowledge of traditional medicinal plants has been passed on from the ancestor's to younger generations for many generations. Khan (1985) reported that 95 species during a survey. The plants were mainly used by Hakims and the annual consumption of medicinal plants was more than 5.65 million kg having an approximate value of up to Rs. 36 million.

Qureshi & Khan (2001) studied the total 25 herbs belonging to 18 families medicinally used by the local inhabitants of the area from Kahuta, Rawalpindi. The most interesting plant was *Cyperus rotundas* L., which was normally used for cholera, dyspepsia and fever. Qureshi (2007) reported 26 plant species from Mianwali area being used mainly for medicine and other purposes e.g. food and for agricultural implements.

The women in Pakistan have a lot of knowledge about the indigenous medicinal plants and their use as Qureshi *et al.,* (2009) described the research on indigenous use of important plants by the local women in southern Himalayan Mountains. Total 28 important plants of 25 families were reported that were used medicinally as well as for many other purposes by the local women.

Kashmir is the hotspot of the floral biodiversity and has a lot of important medicinal plants. People living in the remote areas around Muzaffarabad largely depend on the natural wealth of Plant resources and medicinal plants are the main concerns for these people. Bukhari (1994) described the ethnobotanical and vegetation analysis of Machyara National Park Muzaffarabad. He described 10 plant communities in different areas on Machyara. The results showed that the people in that area were very highly dependent on the traditional medicinal plants for their various needs. Zandial (1994) described 104 important medicinal plant including tree, shrub and herb used by the locals as ethnomedicine in the National Park Machyara, AJK. Qureshi *et al.,* (2007) studied the ethnobotanical studies of selected medicinal plants from Sudhan Gali and Ganga Chotti hills, district Bagh, Azad Kashmir. The indigenous people in the area were using the plants as ethnomedicine. The people of Sudhan Gali and Ganga Chotti Hills were highly dependent on the plants for their daily lives. Total of 33 plant species from 29 genera and 17 families were reported and their therapeutic applications and observations were also made. Mehmood (2011) described the Ethnobotanical and ethno pharmacological surveys of district Bhimber Azad Jammu and Kashmir. He reported 38 plant species of 22 families having ethnomedicinal utilizations. The studies were conducted with the help

of direct observation, questionnaire and interviews with the indigenous people including men and women. He also took data from 13 Hakims and 78 local people to collect ethno medicinal data for plant use. Qamar *et al.,* (2011) reported a total of 67 medicinal plants that were traditionally used by the local people for remedial measures against 32 diseases. Out of 67 species 7 plant species were sold in the market.

Northern part of the country has a lot of potential in terms of medicinal plants diversity and people are directly involved in the indigenous usage and trade of these plants for their health and also income generation. A lot of work is being done in different regions of this part of the country in the field of ethnobotany and indigenous medicinal plants e.g. as Shinwari & Gilani (2003) conducted the Ethnobotanical survey in Astore from Bulashbar Nullah (Gilgit Baltistan / Northern Areas) and collected 33 plant species being used by the local community for the treatment of various ailments. Gilani *et al.,* (2006) reported 21 important medicinal herbs belonging to 19 families being used medicinally by the local inhabitants.

Sadia *et al.,* (2009) documented the ethno-botanical knowledge of important medicinal plants from Northern Pakistan. The area of the study included Thandiani, Kaghan, Swat, Galiat, Buner, Chitral, Dir, and Northern Areas. The results included 135 genera belonging from 66 families of angiosperms and gymnosperms were studied and described. Out of the total plants 76 species were used as indigenous medicinal plants by the locals. Noor *et al.,* (2012) conducted the Ethnobotanical survey with particular reference to the traditional therapy by plants in Astor valley. A total of 133 plant species belonging to 112 genera and 41 families were reported.

Southern Pakistan has also rich floral diversity and very important medicinal plant species. The area has a fair distribution of plain and desert vegetation. Cholistan is a hotspot for the desert flora including many medicinal plants that are used by the local community. Qureshi *et al.,* (2010) described the plants from Cholistan used for stomach and intestinal complaints by the local people included are *Achyranthes aspera, Aerva javanica, Alhagi maurorum, Calotropis procera, Capparis decidua,* and *Zaleya pentandra* being used for the treatment of diarrhea, dyspepsia, constipation, bloating, and diminished appetite.

Conclusion

It is concluded that the indigenous knowledge of the medicinal plants must be preserved and documented for the coming generations as the knowledge is depleting away along with the older generation and the elderly people have this precious knowledge that must be utilized and documented. Pakistan is the country has a lot of potential in the field of indigenous medicinal plants and it has a lot of diversity in the floral diversity having a lot of important medicinal plants throughout the country. The harvesting of these medicinal plants must be in a conserved manner and overexploitation must be avoided otherwise the precious floral diversity could get lost and the plants can become threatened or endangered in future.

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