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ETHNOBOTANICAL STUDY ON SOME USEFUL SHRUBS OF ASTORE VALLEY, GILGIT-BALTISTAN, PAKISTAN

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Abstract

In Astore valley, 26 species of plants under 17 genera and 13 families were found to be used as folk-medicine. The study reveals that the villagers from remote area use medicinal plants for the treatment of joint pain, bone fracture, urine problem, asthma, diabetes, blood pressure and for the treatment of other common ailments. The aborigines also use traditional herbal therapy for their live stocks. Because of high destruction pressure of anthropogenic origin, *Ephedra gerardiana* Wallich *ex* C.A.Meyer, *Berberis* spp., *Rosa foetida* Herrm. and *Rhododendron hypenanthum* Balf. f. were found threatened.

Introduction

In Pakistan out of 5700 species of plants, about 400 - 600 are medicinal and most of which are confined to the mountain areas (Ali and Qaiser 1986). About 50000 to 60000 Tabibs (practitioners of Greco-Arabic medicine) and a large number of unregistered practitioners scattered in rural and remote hilly areas of Pakistan utilize more remedies for curing of several diseases (Hamayun *et al.* 2006). Haq and Hussain (1993) stated that Pakistan has about 40000 registered practitioners of traditional medicine and majority of the population, especially in villages getting health care by Tabibs. About 60% of the total population use the herbal prescriptions of traditional practitioners

Since the British era until to date, Astore Valley, Gilgit-Baltistan, Pakistan has been the largest exporting area of medicinal plants. It is renowned as a realm and a hub of traditional medicinal plants (Kazmi and Siddiqui 1953, Shinwari and Gilani 2003). The mountainous region provides a naturally conductive environment for the medicinal flora. Considerable drugs have been extracted from the flora of the valley and still it possesses a good potential for exploitation and utilization of traditional plants. Details of the topography and climatic condition of the valley has been provided elsewhere (Ali 1995, Noor *et al.* 2013).

Traditional practices followed by the local communities of Astore valley need proper documentation. So, the present study was undertaken to record the indigenous knowledge on plants of the Astore valley and to encourage their sustainable use and conservation.

Materials and Methods

Comprehensive field surveys were conducted throughout the Astore valley (34.8^0-35.8^0 N and 74.4^0-75.2^0 E, altitude 1200- 8126 m MSL, Nanga Parbat), from April to October between 2005 and 2009. The ethnobotanical information was collected by interviewing the local people. For the purpose, a questionnaire was prepared to record information from inhabitants including local names of ethnobotanically important plants, the harvesting and processing techniques, and the

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mode of administration of these plants to treat particular ailments along with other ethnobotanical uses. Importance was given to those people who have knowledge about the uses of plants for health care, like local Hakims and particularly the aged people whose knowledge was respected by the local people.

Voucher plant specimens of ethnobotanical interests were collected from different localities of the study area. All the collected plant specimens were properly pressed, dried and mounted on herbarium sheets. The identification was made with the help of the Flora of Pakistan (Nasir and Ali 1970-1987, Nasir and Ali 1988-1998, Ali and Qaiser 1993-2010), Flora Iranica (Rechinger 1975-2001) and other available pertinent literature and also by comparing with the authentically identified specimens present in the Karachi University Herbarium (KUH). The identified voucher specimens were deposited in the same herbarium (KUH).

Results and Discussion

Twenty six shrub species belonging to 17 genera and 13 families are documented for their ethnobotanical uses (Table 1). The family Rosaceae with 10 species is reported as the largest representative of medicinal plants in the study area which is followed by Grossulariaceae with 3 species, Ephedraceae and Papilionaceae each with two and the remaining 9 families with one species in each.

Four species viz. *Rhododendron hypenanthum* Balf. f. (Fig. 1), *Ephedra gerardiana* Wallich *ex* C.A.Meyer (Fig. 2), *Berberis orthobotrys* Bien. *ex* Aitch. (Fig. 3) and *Rosa foetida* Herrm. are observed as extensively exploited by the local people for their various ethnobotanical uses (Table 1) without any restrictions and following any conservation strategy. As a result, these species are seen to be threatened in the natural habitat of the study area. *Ribes nigrum* L. is also a threatened ethnobotanically used plant of Astore valley. In the present study, it is observed that the knowledge of medicinal plants and their methods of usage are confined to aged persons of mostly above 50 -60 years old. According to Noor *et al*. (2013) the traditional knowledge and the percentage of traditional cure system in Astore valley are rapidly decreasing. However, about 20 - 30 percent people of remote and upper villages are found to be dependent on traditional cure system for their ailments and for their livestock health care. In down and central villages 10 - 15 percent people use the traditional system of treatment for their ailments. This is likely due to the lack of belief of young generation on the traditional medicine system and use of allopathic medicines by them, because of their availability and efficacy.

There is a great need to create awareness among the indigenous communities about threatened medicinal plants. The present study on the economically and medicinally important plants of the study area will help to draw the attention of the government, NGOs and local communities to the basic factors which are directly involved in depleting the plant resources and to develop plans for their protection and sustainable uses in the area. In addition, local cultivation of medicinal plants and other economically important species can play an important role in the economic development of the area. For example, *Hippophae rhamnoides* subsp. *turkestanica* Rousi (Fig. 4) is a common ethnobotanically used plant of the study area which can be useful source of income, if small industries are developed in locally and its fruit is used for preparing jam and syrup. It is useful for cough, blood pressure and as well as energetic. If proper understanding is developed among the aborigines, it may be helpful to generate their income through producing enough medicinal raw material for the traders and pharmaceutical companies.

Table 1. Ethnobotanically used shrubs of Astore valley with family name, common name, vernacular name, parts used and method of uses.

Sl. No.	V. No.	Botanical name with family	Common name	Vern. name	Parts used	Ethnobotanical uses
1	182	*Juniperus communis* L. var. *saxatilis* Pall. (Cupressaceae)	Common juniper	Methero	Berries	Berries are boiled in water or crushed as powder and the decoction is used for kidney and urine problems. Wood is used as firewood.
2	1337	*Ephedra gerardiana* Wall. ex Stapf.	Somlata Joint-pine, Jointfer, Mormon-tea	Sou Sou	Branches and leaves	Fresh branches and leaves are boiled in water and steam given to patient against hay fever, cough, asthma, bronchitis and other respiratory problems. Extract is used as remedy for swelling and joint pain. Wood is used as fuel.
3	1364	*Ephedra intermedia* Sehrenk & C.A. Mey. (Ephedraceae)				
4	2107	*Berberis orthobotrys* Bien. ex Aitch. (Berberidaceae)	Barberry	Chorki	Whole plant	Fruit and leaves are eaten as remedy for blood purification and jaundice. Decoction of root is used for wounds and bone fracture, urine problems, kidney stone, diarrhea and joint pain. Powdered root is sprinkled on wound or made ointment mixed with oil or ghee, applied on wound then bandaged. For internal problems drunk with milk or water. And also used for their livestock for same purposes. Local people give priority to collect the plants which are growing in dry places. Due to ethnobotanical importance of root and un scientific manner of collection, this plant species is rapidly disappearing from its natural habitat.
5	672	*Capparis spinosa* L. (Capparidaceae)	Caper, Caperberry	Kabiliokay	Seed	Seeds are used for mental disorder, skin disease, itching, swelling, and joint pain.
6	49	*Lonicera quinquelocularis* Hardwicke (Caprifoliaceae)	Honeysuckle, Translucent	Pashki	Stem, leaves and fruit	Stem and branches are used for making traditional tools, like handle, sticks etc. young branches with leaves are used as brooms. Ripe fruit is used for skin dryness as moisturizer particularly for hand and face during dry season. Wood is used as fuel.
7	1998	*Euonymus fimbriatus* Wall. (Celastraceae)	Winged spindle, Burning bush	Vatil	Wood	Wood is used for making domestic tools and a chief source of fuel.
8	397	*Hippophae rhamnoides* subsp. *turkestanica* Rousi (Elaeagnaceae)	Sea-buckthorn	Boru	Branches, fruit and berries	Fruit berries are eaten for high blood pressure, diabetes and jaundice. Ash of branches is used for eye disease of cattle particularly when the eye becomes white due to any wound. Berries are also used for making Jams which is used as tonic,

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						appetizer and power stimulant, also used for cough and bronchitis problems. It is planted along the water channel to check damages and soil erosion. Branches are used as fencing for bordering of crop fields and fruit trees to fend off cattle and other harmful animals. The wood is used for making traditional tools and as well as firewood.
9	1649	*Rhododendron hypenanthum* Balf. F. (Ericaceae)	Yellow dwarf *Rhododendron*	Sooser	Leaves	Decoction of leaf is used for high blood pressure, irregular menses and for blood purification. Crushed leaves paste is externally applied on forehead for headache.
10	369	*Ribes alpestre* Wall. *ex* Decne. (Grossulariaceae)	Hedge gooseberry	Hergili	Fruit	Berries are edible and used for fever, stomach disorder, and headache and for blood purification.
11	1559	*Ribes nigrum* L. (Grossulariaceae)	Blackcurrant	Phorpoty	Fruit	Mature berries are eaten for its taste and also considered as energetic and power stimulator. Wood is used as firewood and leaves are used as fodder.
12	1327	*Ribes orientale* Desf. (Grossulariaceae)	Gooseberry	Shatou	Stem and berries	Berries are eaten for its taste and considered as tonic, blood stimulator, energetic and also useful in constipation. Leaves are used as fodder and wood is source of fuel. When ox suffering in stomach pain; beat with stem stick on back for relief of pain.
13	1468	*Colutea nepalensis* Sims	Himalayan Bladder Senna	Bizhee	Branches and wood	Both species have same uses, branches are used for making baskets and wood is used as firewood.
14	1275	*Colutea paulsenii* Freyn (Papilionaceae)		Bizhee		
15	1228	*Cotoneaster affinis* var. *bacillaris* (Lindl.) Scheider (Rosaceae)	Purple-berry	Luny	Berries, stem and branches	Berries are eaten as raw and considered tonic and blood stimulator. Young stem and branches are used for making handles, walking sticks and playing instruments. Young and fresh branches are used for making baskets and other traditional tools. Due to elasticity and hardness of young branches, pealed out the bark and the branches put for drying, the dried branches are used for beat wool to prepare for making thread. Wood is used as firewood.
16	1298	*Cotoneaster gilgitensis* G. Kloltz. (Rosaceae)		Chiti- Luny	Fruit, stem and branches	Fresh fruit paste is used for boils and abscess externally as ointment. Other uses are same as *Cotoneaster affinis* var. *bacillaris*
17	1551	*Prunus jacquemontii* Hook. f. (Rosaceae)	Pacquemont Cherry	Tounl	Fruit and wood	Fruit is eaten as raw for its taste and considered as blood purifier and cardio tonic. Wood is used as firewood.

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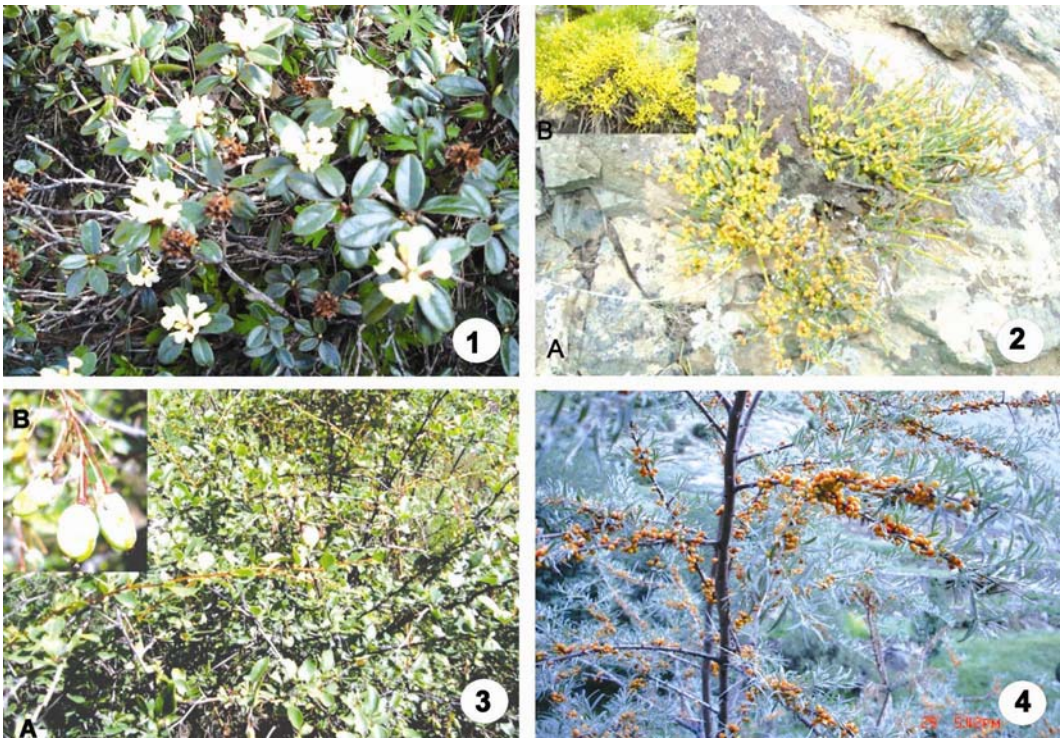
18	1492	*Rosa chinensis* Jacq. (Rosaceae)	Chinese rose	Gulab	Flower	Decoction of flowers is used for abdominal pain and pneumonia.
19	1502	*Rosa foetida* J. Herm. (Rosaceae)	Austrian yellow rose	Ashkaber	Flower	Flower decoction is used for abdominal pain and stomach problems. Flowers are placed in house for its pleasant fragrance and also put in the pages of Holy Quran. Wood is source of fuel.
20	2133	*Rosa multiflora* Thunb. (Rosaceae)	Baby rose, Japanese rose	Satapuri	Flower	Decoction of flowers is used for cough, asthma and abdominal pain. It is also used for urine problems.
21	1505	*Rosa webbiana* Wall. ex Royle (Rosaceae)	Rose	Shegai	Whole plant	Juvenile stem is eaten after peel out the spiny bark as raw for its taste. Decoction of flowers is used for stomach problem and abdominal pain. Stem bark is used for preparing tea and is used for blood purification and skin diseases. Young branch are slightly burnt and obtained a blackish sticky substance on an iron plat after rubbing on the plate called (Matei), it is used for eczema, boils and other skin diseases. Branches are used for making walking sticks, handle of tools and other traditional items. Wood is source of fuel. This spiny shrub is also used as barbed fences around cultivated fields and gardens to fend off cattle.
22	604	*Rubus irritans* Focke (Rosaceae)		Aichey	Fruit	Fruit is eaten as raw for its taste and useful for blood purification, blood stimulation, liver, digestive problems and heart troubles.
23	1149	*Rubus saxatilis* L. (Rosaceae)	Stone bramble	Popay	Fruit	Fruit is eaten as raw for its taste and also considered as blood purifier, cardiac tonic and appetizer.
24	165	*Spiraea canescens* D. Don (Rosaceae)	Himalayan spiraea	Darai	Stem and flowers	Decoction of flowers is used for birth control and abortion. Stem is used for making walking sticks, handle of tools and for maxing of fragmented milk; which is put to obtain butter (Ghee). Wood is used as firewood.
25	457	*Daphne mucronata* Royle (Thymelaceae)	Kashmir daphne	Nike	Leaves	Plant leaves are locally considered poisonous; leaf decoction is externally used for skin diseases.
26	2130	*Vitis vinifera* L. (Vitaceae)	Wild grape	Jach	Fruit and leaves	Fruit is edible and considered as blood purifier, cardio tonic and appetizer. Dry fruit is used for fever. Juice of fruit is used for hepatitis. Leaves are used as fodder.

V. No. = Voucher number, Vern. = Vernacular



Figs 1-4: Threatened medicinal plants of Astore valley. 1. *Rhododendron hypenanthum*. 2. *Ephedra gerardiana* (A-habit, B-Flower). 3. *Berberis orthobotrys* (A-branches, B-fruit). 4. *Hippophae rhamnoides* subsp. *turkestanica*.

Due to the expansion of agricultural land, habitat degradation, sliding, over exploitation and unsustainable uses of plants in the study area a number of taxa has been observed to be disappeared from natural habitats. There is a strong need to take immediate steps on urgent basis to conserve their population in their habitat.

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