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# Exploration of Medicinal Plants and Their Conservation Status at Higher Altitude of District Shangla, Khyber Pakhtunkhwa, Pakistan

[1]Abdul Razzaq, [1]Fazal Hadi, [1]Abdur Rashid, [2]Muhammad Ibrar and [1]Usman Ali

[1]Centre of Plant Biodiversity, University of Peshawar, Peshawar, Pakistan
[2]Department of Botany, University of Peshawar, Peshawar, Pakistan

**Abstract:** A study was carried out to elaborate the medicinal plant diversity at higher altitude of District Shangla, Khyber Pakhtunkhwa, Pakistan. The district is located between 33°-31' to 34°-08' North latitudes and 72°-33' to 73°-01' East longitude. Floristically the area comes under Sino- Japanese region. The study revealed that there were 25 medicinal plant species belonging to 21 families. Among these species 19 were herbs, 3 were shrubs, 2 species were climbers and one was tree. The most important species are: *Aconitum violaceum*, *Aconitum heterphyllum*, *Berberis vulgaris, Viola canescens, Valeriana jatamansii*, *Podopyllum emodi*, *Paeonia emodi*, *Geranium wallichianum*, *Polygonatum verticillatum*, *Ajuga bracteosa* etc. The plant biodiversity of the area is under high biotic pressure as a result of indiscriminate deforestation, overpopulation, over grazing, habitat destruction, unscientific collection and establishment of invasive species. There is dire need to protect and conserve the medicinal biodiversity of the area.

**Key words:** Medicinal plants · Ethnobotany · Conservation status · District Shangla · Pakistan

## INTRODUCTION

District Shangla is located between 33-31' to 34°-08' North latitude and 72-33' to 73-01' East longitude. It has an area of 11528 acres of high mountain terrains with moist temperate and coniferous types of vegetation. The total area of the forest is 8090 acres. The district is bounded on the east by districts Batagram and Kala Dhaka (Spin-Gher), on the west by district Swat, on the south by district Buner and parts of Kala Dhaka and on the north by district Kohistan [1].

District Shangla is one of the mountainous areas of Pakistan with small and narrow valleys. The general elevation of the district varies from about 2000-3500m and the highest point is near Kuz-Ganrshal in the north of the district which is 3,440 m high. The mountain slopes of the district are covered with thick forests which are hot spot for medicinal plants and most of the people are using these plants as primary source of health care.

Pie and Manandhar [2] reported that at least 70 % of the medicinal plants are wild in the Himalayan region and approximately 70-80 % of the population in this mountainous region depends on traditional medicines for health care. Shinwari *et al.* [3] searched out 48 ethnomedicinal plants from Kaghan Valley, Pakistan. Ali *et al*. [4] reported that 99 medicinal plants are sold in Mingora city, Pakistan as a business material. Hussain *et al*. [5] reported that 121 plant species are used for many ailments in Shawar valley, Swat. Similarly, Razzaq *et al*. [6] conducted a comprehensive study on the ethnomedicinal plants of Changa Valley, Shangla, Pakistan and reported 50 species used for curing various ailments. Hadi *et al*. [7] reported 29 ethnomedicinal plants from Rich valley district Chitral, Pakistan, having variety of uses. Razzaq *et al*. [8] reported 22 medicinal weeds species from District Shangla which are used for variety of health disorders.

The anthropogenic activities like indiscriminate deforestation, overpopulation, over grazing, habitat loss and unscientific methods of collection of medicinal plants have resulted great treats to local flora. The introduction and establishment of invasive alien species is gradually replacing the indigenous flora as well. Therefore, the present study is conducted to collect information about indigenous flora, their ethnobotanical uses and to present the conservation status of these plants.

**Corresponding Author:** Fazal Hadi, Centre of Plant Biodiversity, University of Peshawar, Peshawar, Pakistan.

## MATERIALS AND METHODS

The plants were collected from various localities of the area and identified with the help of different volumes of flora of Pakistan [9-11]. The data about indigenous use of plants and socio-economical profile of the residents was obtained by interviewing the women and men of the area through a simple questionnaire.

## RESULTS AND DISCUSSION

Plants are essential components of an ecosystem and play an important role in the sustainability and smooth flow of energy in the ecosystem. Plants are used as timber, food and medicines etc. throughout the world. They are very important for health care as up to 80% of world population is still relying on traditional medicines [12].

Table 1: Medicinal plants of higher altitude of Shangla district, Pakistan with their conservation status and ethnobotanical uses.

| S# | Plant name | Local name | Family | Habit | Conservation status | Part used | Ethnobotanical uses |
|---|---|---|---|---|---|---|---|
| 1 | *Allium humile* Kunth | Ghra pyaz | Aliaceae | Herb | Rare | Leaves | The leaves are stimulant, diuretic, expectorant, carminative and also utilized for hypertension and stomach disorders |
| 2 | *Aconitum heterophylum* Wall. Ex Royle. | Serba zela | Ranunculaceae | Herb | Rare | Roots | The roots are expectorant, tonic and used in dysentery, diarrhea, fever, vomiting and stomach disorders |
| 3 | *Aconitum violaceum* Jacq. Ex Staf. | Ghra Zaher | Ranunculaceae | Herb | Rare | Rhizome | The rhizome is highly toxic and may cause even death, however it is tied in the sheep's or goat intestine and boiled thoroughly in the milk. The milk is then removed and the rhizome is crushed into powder and is used against rheumatism and arthritis. |
| 4 | *Adiantum capillus-veneris* L. | Sumbul | Adiataceae | Herb | Frequent | Fronds | Fronds are used as cooling agent, diuretic, expectorant and tonic and also used for cleaning and sparkling of teeth. |
| 5 | *Asparagus officinalis* L. | Shal-gutte/ punja | Liliaceae | Herb | Rare | Rhizome | The rhizome is tonic, demulcent, diuretic and used with milk for uterine tumors, leucorrhoea and dysentery |
| 6 | *Berberis lyceum Royle*. | Kware/ Zeyar largai | Berberidaceae | Shrub | Vulnerable | Roots and friuts | Fruits are edible. Root and stem bark is tonic, carminative and blood purifier. Root is antiseptic, tied upon the fractured bones and utilized for healing of internal and external wounds, arthritis and ulcer and in delivery cases |
| 7 | *Bergenia ciliata* (Haw) Sternb. | Ghat-pana/ Zakhm-e-Hayat | Saxifragaceae | Herb | Vulnerable | Roots | Root is tonic and also utilized for curing muscular pain, anti-diabetic, expectorant, sunburn, stomachache and running eyes |
| 8 | *Bistorta amplexicaulis* (D. Don) Green | Tarwa pana/ Anjabar | Polygonaceae | Herb | Common | Roots | The powdered root is taken with water for treatment of gout, rheumatism and ulcer |
| 9 | *Dioscorea deltoidea* Wall. ex Griseb. | Qanis | Dioscoraceae | Climber | Rare | | The root is used as vermifuge especially for children and expelling tap worms from the body. The root and tuber is diuretic, expectorant and as a uterine sedative |
| 10 | *Geranium wallichianum* D. Don ex Sweet | Sra zela | Geraniaceae | Herb | Frequent | roots | Root is tonic and is used to lower the blood pressure and also effective against jaundice. |
| 11 | *Hedera nepalensis* K. Koch | Prewathe/ zeley | Araliaceae | Climber | Frequent | Leaves and fruits | Leaves extract used for curing diabetes, abdominal pain and diuretic. Fruits are purgative |

Table 1: Continue

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 12 | *Juglans regia* L. | Ghoz/ Akhrot | juglandaceae | Cultivated deciduous tree | Threatened | Nut, bark and leaves | Leaves and bark of root (Dandasa) is used for cleaning and sparkling teeth. The fruit is edible, tonic and used for increasing mental and sexual capacity |
| 13 | *Morchella esculenta* (L.) Pers ex. Fr | Gujae | Halveliaceae | Wild | Rare | Whole plant | It is highly protienitious, fried and eaten for its delicious taste. The growing season of the plant is from March–May under shady trees at 1500 – 2500 m height |
| 14 | *Paeonia emodi* Wall. ex. Hk. f. | Mamekh | Paeoniaceae | Herb | Vulnerable | Rhizome | Rhizome is boiled in milk and used for backbone ache, general body weakness and as sexual tonic. Seeds are purgative and blood purifier. |
| 15 | *Plantago lanceolata* L. | Jabai | Plantaginaceae | Herb | Common | Leaves and seeds | Leaves are astringent and refrigerant and effective against dysentery and mouth diseases |
| 16 | *Plantago major* L. | Ghata jabai | Plantaginaceae | Herb | Common | Leaves, inflorescence and seeds | Leaves are refrigerant and astringent. Seeds are tonic and used for cooling effect. The seeds are mixed with honey and used in constipation. The inflorescence of plant is utilized for measles in children |
| 17 | *Podophyllum hexandrum* Wall. | Kakora | Podophyllaceae | Vulnerable | Shady herb | Fruits, seeds and rhizome | Fruits and seeds are general body tonic. Powder rhizome is used to control jaundice and other liver diseases and as stimulant, emetic and purgative |
| 18 | *Polygonatum verticillatum* All. | Nor-e-Alam | Liliaceae | Rare | Herb | Rhizomes | Rhizome is used for rheumatism, general body weakness and as aphrodisiac |
| 19 | *Primula denticulata* Smith | Asli Mamera | Primulaceae | Threatened | Herb | Rhizomes | Rhizome is expectorant and antibacterial |
| 20 | *Rosa webbiana* Wall. ex Royle | Ghra Gulab | Rosaceae | Rare | Climber to prostrate shrub | Leaves and Flowers | Leaves are stimulant and juice of the flowers used as remedy for eye trouble. |
| 21 | *Rumex dentatus* L. | Shalkhey | Polygonaceae | Common | Herb | Leaves | The leaves are diuretic, astringent and soothing irritation caused by *Urtica dioica* which often found near the *Rumex.* |
| 22 | *Skimmia laureola* (DC.) Sieb. & Zucc.ex Walp. | Nazar pana | Rutaceae | Threatened | shrub | Leaves | Leaves are used in curing small pox and it is believed that smoke of leaves burning is effective to repel evils. |
| 23 | *Thymus linearis* Benth. | Ghra Chai | Lamiaceae | Rare | Herb | Fruits and shoots | The fruits and shoots are used for making green tea and used as tonic for cold, cough and digestive problems. |
| 24 | *Valeriana jatamansii* Jones | Mushk-e-Bala | Velerianaceae | Vulnerable | Herb | Rhizomes | Rhizome is used for fever, stomach and urinary disorders. Rhizome is aromatic, antispasmodic and carminative |
| 25 | *Viola serpens* wall. | Banafsha | Violaceae | Threatened | Herb | Whole plant | Flowers are collected at commercial scale and used as diaphoretic, antiseptic, febrifuge and relieves cough, cold, liver congestion and sinuses. Decoction of flowers is blood purifier and coolant. Roots are useful in jaundice and as carminative |

In the present study attempt was made to collect medicinally important plants of high altitude of district Shangla, Khyber Pakhtunkhwa, Pakistan. The local inhabitants of district are mostly dependant on indigenous plants for their requirement of food, medicines and wood. The use of these plants as medicine for primary health care is commonly practiced in the area due to socioeconomic condition of inhabitants, high prices of allelopathic medicines and lack of modern health care facilities. Twenty five plants used for various ailments were collected from higher altitude of district Shangla, Pakistan. The plants are mostly used as stomachic, expectorant, tonic, anti-pyretic, pediatric and sedative and as blood purifier (Table 1). The over and unsustainable collection and exploitation of some medicinal plants are great threats to the flora of the valley. The over collected and exploited plants include *Polygonatum verticillatum*, *Viola canescens, Berbers vulgaris, Valeriana jatamansii*, *Paeonia emodi* and *Podophyllum hexandrum*. These plants may become extinct from the area in future if constantly being exploited at such rates.

An awareness campaign about the importance of the indigenous flora, sustainable plants collection and conservation of important medicinal plants would be desirable. The local community must be engaged in conservation practices to secure and provide safeguard to the medicinal flora of the area.

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