

## MARKETABLE MEDICINAL PLANTS OF MARGALLA HILLS NATIONAL PARK, ISLAMABAD

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### Abstract

This article is based on the results of ethnobotanical investigations conducted in Margalla Hills national Park. The market survey was aimed to know the market value of medicinal species, rate of consumption, availability and vulnerability to harvesting. Questionnaires were adopted for interviews of local inhabitants, herbalists, pansaries, park authorities and societies on random bases. Only 26 species have been found as marketable medicinal plants collected by the inhabitants, drug dealers and herbalists for their socioeconomic value. Among the species sold in the local market, 3 species i.e., *Asparagus adscendens* Roxb., *Berberis lycium* Royle. and *Viola canescens* Wall. ex Roxb. found vulnerable to harvesting.

### Introduction

Margalla Hills national Park (12,605 hectares, 40 km in length) located between 33° 40'-33° 44' N and 72° 55'-73° 20' E and forms the northeastern edge of Islamabad. It spreads in a roughly east-west direction and its altitude varies from 465m to 1600m, having rugged topography comprising mainly of steep slopes and gullies where rock structure is basically limestone. Deforestation and grazing have caused soil erosion leaving little but parent rock with shallow residual soil and silty loess. The average maximum temperature is 3.4°C. Snow is occasional. Rainfall occurs in the monsoon and winter, the average being 1200mm per year. The park is under pressure due to illegal settlements, quarries, fires, extensive tree cuttings, urban encroachment and pollution.

It has been described that medicinal herbs are used by the local inhabitants of the park for various ailments. However encroaching industrialization and accompanying changes in the life styles are responsible for the decrease of practice in the local use of herbs for traditional medicine. About 10 herbaceous are found to be sold in the local market (Shinwari and Khan, 2000). Similarly plant parts of 10 species of trees and 5 species of shrubs are being sold in the local market. *Acacia modesta* Wall., *Acacia nilotica* (L.) Delile and *Berberis lycium* Royle are under pressure of being used as fuelwood. (Shinwari & Khan, 1998).

The main objectives of the study were to access market value of the local medicinal plants, their ecological status and potential of income generation for local people living in Margalla Hills.

## Methodology

During the fieldwork, visits were conducted at proper time i.e., from plant collection up to the storage. Interviews were taken and observations were made during guided and transect walks. Plant specimen were collected and preserved in the herbarium of Quaid-e-Azam University Islamabad. Interviews of local inhabitants, herbalists, pansaries, park authorities and societies were conducted on random bases. Questionnaires were adopted for interviews. Outcome of the results were rechecked and compared with literature.

## Results

Only 26 species were identified as marketable medicinal plants collected by the inhabitants, drug dealers and herbalists for their socioeconomic value. Marketable medicinal plant species of Margalla Hills National Park are found as follows.

### TREES

1. ***Acacia modesta*** Wall. (Mimosaceae) 'Phulahi': Sticks are used as tooth brush (Miswak). Gum of the bark is used as tonic and stimulant. Ash is used in snuff preparation.
2. ***A. nilotica*** (L.) Delile (Mimosaceae) 'Kikar': Pods are used as powerful expectorant. Bark is used in diarrhea, dysentery, as stomachic and as astringent. A mixed powder of leaves, flowers, bark, fruit and root together is used as aphrodisiac.
3. ***Bauhinia variegata*** L. (Caesalpinaceae) 'Kachnar': Dried buds are used in diarrhea and worms. Decoction of root is given in dyspepsia. Root is used as an antidote to snake bite.
4. ***Butea monosperma*** (Lam.) O. Kuntze (Papilionaceae) 'Dhak': Flowers are used as astringent, diuretic, depurative, aphrodisiac. Bark and seeds are used in snakebite. Whole plant is used against diabetes.
5. ***Cassia fistula*** (Caesalpinaceae) 'Kinjal, Amaltas': Pulp of the fruit is used as remedy for constipation. Seeds are used as cathartic and emetic.
6. ***Ficus bengalensis*** L. (Moraceae) 'Bohr': Leaves are applied, heated as a poultice, to abscesses. Seeds are used as cooling and tonic. The milky juice of fruits leaves buds and the bark of aerial roots is used as aphrodisiac.
7. ***Mallotus philippensis*** (Lam.) Muell.-Arg (Euphorbiaceae) 'Kamila': Powder obtained from the fruit is used as a vermifuge, purgative and in certain skin diseases. The leaves and barks are also used for poulticing in cutaneous diseases.

8. ***Melia azedarach*** Linn. (Meliaceae) 'Drek': seeds are used in rheumatism. Ripen fruit is also used against diabetes.
9. ***Phyllanthus emblica*** L. (Euphorbiaceae) 'Amla': Dried fruit is used in hemorrhage, dysentery, jaundice, dyspepsia and anemia. Exudation from the fruit is externally applied on the inflammation of eye. Fresh fruit is used to make jam, jelly and meal or syrup.
10. ***Quercus leucotrichophora*** A. Camus (Fagaceae) 'Rein': Corm is used as astringent and diuretic, also used in diarrhea, indigestion, asthma and gonorrhoea.

## SHRUBS

11. ***Berberis lycium*** Royle (Berberidaceae) 'Sumbal': Fruit is used as cooling and laxative, also used for the relief of intestinal colic and for the treatment of pharyngitis. Bark of the root is also used against diabetes.
12. ***Embelia ribes*** Burm. (Myrsinaceae) 'Baobrung': Seeds of the plant have been used as anthelmintic, alterative, and tonic. Also used as carminative and stomachic.
13. ***Justicia adhatoda*** L. (Acanthaceae) 'Bheekar': Leaves and roots are used for cough, bronchitis, asthma, and rheumatism. Leaves buds are also used in diabetes, for joints and eruption.
14. ***Punica granatum*** L. (Punicaceae) 'Anar': Seeds are used as stomachic, pulp is used as cardiac and stomachic. Fresh juice is known as cooling and refrigerant.
15. ***Vitex negundo*** Linn. (Verbenaceae) 'Marwan': fresh leaves are used in the form of bandage for pain of chest and back. Also used for skin allergy.

## HERBS

16. ***Asparagus adscendens*** Roxb. (Liliaceae) 'Musli Sufaid': root is used as glactagogue, demulcent, tonic, useful in diarrhea, dysentery and general debility.
17. ***Cannabis sativa*** L. (Cannabinaceae) 'Bhang': dried and crushed leaves are taken as a drink for their narcotic action, also used as refrigerant. The plant is used as a tonic, narcotic, sedative and anodyne.
18. ***Chenopodium album*** L. (Chenopodiaceae) 'Batho': roots are used in jaundice, urinary diseases and rheumatism. Fruit and root are used as antidote to snake poison.
19. ***Cuscuta reflexa*** Roxb. (Cuscutaceae) 'Zarbuti': Seeds are used as carminative, alterative, anthelmintic. Stem is used in bilious disorders.
20. ***Lactuca serriola*** L. (Asteraceae) 'Kahu': the herb is used as cooling,

sedative, diaphoretic, diuretic, antiseptic, hypnotic, expectorant, useful in the treatment of coughs in phthisis, bronchitis, asthma and pertussis.

21. *Sisymbrium irio* L. (Brassicaceae) 'Jungli Sarsoon': seeds are used as expectorant, stimulant and restorative, also used externally as a stimulant poultice.
22. *Solanum ameriakanum* Mill. (Solanaceae) [Black fruit] 'Makoi'
23. *S. villosum* Miller (Solanaceae) [Yellow/Orange fruit] 'Makoi': Decoction of both the plants is used for washing the inflamed and painful parts of the body. Juice of the leaves is used for skin diseases.
24. *Tribulus terrestris* L. (Zygophyllaceae) 'Bhakra': Fruit is regarded as tonic, diuretic, cooling and aphrodisiac. Also used in urinary disorders, impotency, cough and heart diseases.
25. *Viola canescens* Wall. Ex Roxb. (Violaceae) 'Banafsha': Flowers are used as a wild purgative.
26. *Withiana sominifera* (L.) Dinal (Solanaceae) 'Aksan': Green leaves are used to relieve the pain from joints and painful swelling. Roots are used as diuretic and tonic. Juice of the whole plant is useful in rheumatism. Seeds are used to coagulate milk.

## Discussion

Market survey of medicinal plants is one of the important features of ethnobotanical work. Such kind of work have been reported from some part of the world e.g., Pei et al., (1990) presented the results of ethnobotanical investigation of plant drugs that are being traded at local markets in north-West Yunnan. According to them about 574 species of medicinal plants are traded as crude drugs in various local markets of Northwest, China. These drugs of plant origin have been traditionally used in the Chinese medicinal system throughout the country, and locally used in indigenous medicines by herbal doctors amongst different ethnic groups.

As mentioned in the evaluation (Table 2), three species *Asparagus adscendens*, *Berberis lycium*, and *Viola canescens* are found vulnerable due to their parts used, growth rate, quantity of consumption and pressure like grazing, erosion and fuel wood collection etc. They are particularly needed to be conserved by domestication and regeneration techniques. The flowers of *Jasminum humile* available at Margalla Hills National park, are used to extract oil which is very expensive and useful generally not available in the market. Jasmine oil, which is available in the markets, extracted from other species of Jasmine, which is of inferior quality. This plant also needs to be promoted in this area and should be conserved.

Table 1. Annual consumption of medicinal plants of socio-economic value (folk medicinal plants sold by the park people/collectors).

No.	Botanical names	Parts used	Local name	Drug	Average price Rs./Kg	Average consumption Kg/year
<b>TREES</b>						
1	<i>Acacia modesta</i>	Sticks	Phulai	Phulai Miswak	10-15	150
2	<i>A. nilotica</i>	Pod	Kikar	Kikar ki Phali	31-60	50
3	<i>Bauhinia variegata</i>	Buds	Kuchnar	Kachnal	08-10	140
4	<i>Butea monosperma</i>	Flowers	Dhak	Gul-i-Tipu	06-10	2120
5	<i>Ficus bengalensis</i>	Seed	Kinjla	Maghaz Amaltas	15-20	700
6	<i>Cassia fistula</i>	Leaves	Bhoar	Bar ki Mehindi	15-10	200
7	<i>Mallotus philippensis</i>	Fruit	Kamila	Kamila	50-100	400
8	<i>Melia azedarach</i>	Seed	Drek	Tukhum Bakain	30-40	460
9	<i>Phyllanthus emblica</i>	Fruit	Amla	Amla	10-30	200
10	<i>Quercus leucotrichophora</i>	Nut	Rin	Balooth	40-50	615
<b>SHRUBS</b>						
11	<i>Berberis lycium</i>	Fruit	Sumbal	Zrishk	120-200	130
12	<i>Embelia ribes</i>	Seed	Baobrung	Baobrung	40-50	8180
13	<i>Justicia adhatoda</i>	Leaves	Bhekar	Bhekar	3-5	11500
14	<i>Punica granatum</i>	Flower	Anar	Gul-i-Anar	100-150	640
	-do-	Fruit	Anar	Anardana	50-80	2225
15	<i>Vitex negundo</i>	Seed	Banua	Tukhum Sabalu	10-15	365
<b>HERBS</b>						
16	<i>Asparagus adscendens</i>	Root	Musli	Saqaqab-I-Misri	600-800	860
17	<i>Cannabis sativa</i>	Seed	Sufaid	Bhang	50-120	111
18	<i>Chenopodium album</i>	Seed	Bhang	Bathuya	10-15	550
19	<i>Cuscuta reflexa</i>	Seed	Bathuya	Tukhum Affiume	35-40	860
20	<i>Lactuca serriola</i>	Seed	Zarbuti	Tukhum kahu	100-150	2490
21	<i>Sisymbrium irio</i>	Seed	Kahu	Khakshi	60-80	6365
22	<i>Solanum americanum</i>	Whole	Khaksi	Makao	20-40	4910
23	<i>S. villosum</i>		Makoi	Makao	20-40	4910
24	<i>Tribulus terrestris</i>	Whole	Makoi	Gokhro	20-40	3465
25	<i>Viola canescens</i>	Flowers	Bhakra	Gul-I-Banafsha	180-300	9840
	-do-	Whole	Banafsha	Barg-I-Banafsha	20-40	3950
26	<i>Withiana somnifera</i>	Whole	-do- Aksan	Isgandh	70-100	3270

Source: Local market, Pansaries, Dawakhanas, and drug shops of Rawalpindi and Islamabad.

If the commercial value of *Asparagus adscendens* is considered, its tubers are sold at about Rs.800.00/-Kg in the local market (Table 1). It is very essential to regenerate and propagate this plant through vegetative propagation and other techniques for quick regeneration. This plant can serve as a good source of income for commercial purposes for the people of this area.

There is a need to develop close liaison with all stakeholders at local market for long term sustainable protection of habitat and its resources. In this regard awareness may be enhanced for wise use of available resources. As for example, one may narrate about the habitat to locals including hakims about sustainable plant collection method that they may pluck half of the plant so that the left ones may grow up next year and could sustain for next visit and so on for next generations.

The process of collection, identification, preservation, storage and marketing of medicinal plants in area under consideration is found to be based on traditional knowledge and not through scientific approach (Shinwari and Khan, 2000). Therefore a lot of impurities, adulteration, unhygienic material is also included during the flow to the market. Hence there is a need to streamline the process on scientific grounds. This will benefit the local collectors as well as the whole sellers of medicinal plants.

## Conclusion

The results of the survey can be applied to the management plan of the park for conservation. Vulnerable medicinal species should be focused for regeneration and propagation. Establishment of botanical gardens is suggested in this regard. Research institutions should be involved to point out the regeneration and propagation techniques for the vulnerable medicinal species. Collection of medicinal plants carried out by the collectors may be streamlined to provide ample regeneration time to the plants keeping their optimum period of growth in view. The area once used for collection may be declared as protected area and no more extraction may be allowed for a period of few years.

## References

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Table 2. Relationship among marketable medicinal plants of MHNP (vulnerable to harvesting)

No.	Botanical names	Availability	Consumption	Growth	Part used	Total score
<b>TREES</b>						
1	<i>Acacia modesta</i>	1	2	0	4	7N
2	<i>A. nilotica</i>	1	2	0	4	7N
3	<i>Bauhinia variegata</i>	1	2	0	4	5N
4	<i>Butea monosperma</i>	1	0	0	4	5N
5	<i>Ficus bengalensis</i>	1	0	0	4	7N
6	<i>Cassia fistula</i>	1	2	0	4	7N
7	<i>Mallotus philippensis</i>	1	2	0	4	7N
8	<i>Melia azedarach</i>	1	2	0	4	5N
9	<i>Phyllanthus emblica</i>	1	0	0	4	5N
10	<i>Quercus leucotrichophora</i>	1	0	0	4	5N
<b>SHRUBS</b>						
11	<i>Berberis lycium</i>	0	2	0	0	2V
12	<i>Embelia ribes</i>	1	0	0	4	5N
13	<i>Justicia adhatoda</i>	1	0	0	4	5N
14	<i>Punica granatum</i>	1	0	0	4	5N
15	<i>Vitex negundo</i>	1	2	0	4	7N
<b>HERBS</b>						
16	<i>Asparagus adscendens</i>	1	0	3	0	4V
17	<i>Cannabis sativa</i>	1	0	3	4	8N
18	<i>Chenopodium album</i>	1	0	3	4	8N
19	<i>Cuscuta reflexa</i>	1	0	3	4	7N
20	<i>Lactuca serriola</i>	1	0	3	4	8N
21	<i>Sisymbrium irio</i>	1	0	3	4	8N
22	<i>Solanum americanum</i>	1	0	3	4	8N
23	<i>S. villosum</i>	1	0	3	4	7N
24	<i>Tribulus terrestris</i>	0	0	3	4	7N
25	<i>Viola canescens</i>	1	0	3	0	4V
26	<i>Withania somnifera</i>	0	0	3	4	7N

**1.Availability**

Common=1

Uncommon=2

**2.Consumption**

Less than 500Kg/year=2

More than 500Kg/year=0

**3.Growth form**

Regrowth in one year=3

Regrowth in more than a year=0

**4.Parts used**

Stem/leaves/Flowers/seeds=4

Whole plants=0

**\*Score**

5-10= Not vulnerable(N)

0-4= Vulnerable(V)