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## Taxonomical Description and Ethnobotanical Survey for Indigenous Use of Some Medicinal Plants of Rawalpindi District

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**Abstract:** The survey of medicinal plants was conducted in different areas of Rawalpindi district. A total of fifteen plant species from thirteen different families were studied for their therapeutic potential. There were eight trees, two shrubs and five herbs in the selected medicinal plants. All the plants were dicotyledons. All were angiosperms. The selected plant species were described taxonomically, with parts of plants used and general medicinal property of each plant. Different medicinal flora were transferred for a live herbarium and a dry herbarium was also maintained. It is desired that the indigenous plant material should be collected, identified, processed and utilized for medicinal purposes.

**Key words:** Taxonomical, ethnobotanical, herbarium, Rawalpindi

### Introduction

Since the time of early Neanderthal man, plants have been used for healing purposes (Buchman, 1980). Even as modes of medicines have been changed throughout the centuries, plants continued to be the main stay of country medicine, as methods and ideas on plant healing were passed down through generations. Thus tribes, clans, villages, towns, sometimes entire countries tended to have similar styles in ethnomedicines.

The indigenous traditional knowledge of herbal plants of communities, where it has been transmitted orally for many years is fastly disappearing from the face of world due to the transformation of traditional culture. The collection of information about natural flora, classification, management and use of plants by other people holds importance among the Ethnobotanists. The local people and researchers face the challenging task of not only recording knowledge of the plants, but also applying the results of their studies to biodiversity conservation and community development (Malik *et al.*, 1990). Plants have been used for their therapeutic potential in various segments of society for centuries (Qureshi and Askari, 1996; Said, 1996).

The necessity for exploitation of indigenous drugs has been felt with the increasing need of drugs and medicines (Chopra, 1974). It is required that indigenous plant material should be collected, identified, processed and utilized for medicinal purposes. There is a need for urgent preferential probe of plant resources because with rapid urbanization of forests and hills, the rich herbal wealth of Pakistan is fastly dwindling. It appears that these are, by and large, ruthlessly and crudely exploited by the

unauthorized drug collectors and as a result of which existence of particular herbal species has been threatened (Hussain, 1987). Moreover, it has been observed that the total forest area, where from these drugs are obtained in recent years, has been reduced greatly. This fact has also contributed in losing the drug yielding plants. The medicinal plant wealth of Pakistan in general and of Rawalpindi district in particular has not yet been exploited fully and data is scattered. It is therefore suggested, that efforts should be made for expansion and artificial propagation of these plants as far as possible.

Thereby the wild growing plants could be brought under systematic cultivation and the exotics introduced may also be cultivated if climatic conditions are favorable (Kumar *et al.*, 1997). Drug plants of Rawalpindi district has been found of immense importance as the adverse effect of synthetic drugs on human health has created various types of complicated diseases besides causing immunity for drugs in bacteria etc. Moreover, every year a considerable amount of foreign exchange is involved in the import of drugs of foreign origin. The utilization of indigenous drug resources will increase the importance of local industry on the one hand and will minimize the expenditure incurred on the purchase of foreign drugs on the other. So, it was decided to conduct a survey study with the following objectives:

- To collect the selected medicinal plant species,
- To identify and describe these plants taxonomically,
- To maintain a live and dry herbarium of important medicinal plants of local area.

## Materials and Methods

Methodology consisted of three parts.

**Ethnobotanical survey:** Ethnobotanical survey was conducted in Rawalpindi district. For the medicinal uses of selected plants, the local hakims were interviewed. Questionnaire was adopted to collect the knowledge of local hakims about the medicinal uses of each plant species regarding as the family name, botanical name, local name, part used, flowering period and medicinal uses.

**Taxonomic description for identification:** For identification plants were identified by comparing already identified, mounted and preserved plants of the Herbarium of Quaid-I-Azam University, Islamabad and brief taxonomic description from literature is given for each species, which will be helpful for further identification. After identification plants were deposited in the Herbarium of University of Arid Agriculture, Rawalpindi for further references.

**Maintenance of live and dry herbarium:** The selected medicinal plants from different localities of Rawalpindi district were collected and mounted for dry herbarium using herbarium techniques and were transferred also, to the UAAR for the maintenance of a medicinal plant garden.

## Results

The selected medicinal plants are described as under,

### *Acacia nilotica* Miller

**Family:** Leguminosae

**Vernacular name:** Kikar

**Description:** It is a wild as well as cultivated tree in dry places. Root, tap root system. Stem erect, cylindrical, branched and woody. Leaves, cauline and ramal, alternate, petiolate, stipulate, compound, bipinnate. Flower axillary cymose heads, small, ebracteate, sessile, actinomorphic, hypogynous.  $K_{(5)}$ , slightly petaloid, campanulate.  $C_{(5)}$ , tubular, inferior. A, filaments long and conspicuous.  $G_1$ , unilocular, ovules numerous. Fruit, legume lomentaceous pod. Seeds ex-albuminous (Chopra, 1974).

**Medicinal uses:** Bark astringent, demulcent, antiseptic, its powder as tooth powder, extract issued in treatment of asthma, bronchitis. Gum as an antimicrobial, useful in diarrhoea, dysentery and in diabetes. Pods in impotency and urinogenital disorders. Leaves antiseptic (Agarwal, 1997; Maxted and Crust, 1995).

### *Albizia lebbeck* Benth

**Family:** Leguminosae

**Vernacular name:** Siris

**Description:** A large deciduous tree. Root, tap root system. Stem, erect, woody, bark fissured. Leaves, compound, evenly bipinnate, petiole long, glands also often present at the bases of the upper pairs of pins, stipules minute. Flower in axillary clusters of 2-4, bracteate, regular, complete, actinomorphic, bisexual, tomentose, caduous.  $K_{(5)}$ , small, campanulate, pubescent, inferior.  $C_{(5)}$ , five lobed.  $A_0$ , monadelphous, anthers minute.  $G_1$ , unilocular, ovules many, style slender, stigma capitate. A pod fruit, thin, flat and straight. Seeds sub-orbicular oblong, brown (Chopra, 1974; Kumar, 1997).

**Medicinal uses:** Plant is useful in snake bite, its gum contains tannin and saponin, possesses anticancerous property, leaves used in night blindness, bark powder used for strengthening gums, astringent, diarrhoea, act as tonic, restorative, seeds hypoglycosidic, anticancer (Agarwal, 1997; Hussain, 1987; Bentley and Triman, 1991).

### *Calotropis procera* R.Br.

**Family:** Asclepidaceae

**Vernacular name:** Akk

**Description:** A common shrubby weed. All parts contain milky latex. Root, tap root system, deep. Stem woody below and herbaceous above. Leaves sessile, opposite and decussate, glaucous, abovate-oblong, acute. Flower axillary umbellate cymes, pedicellate, complete, regular, bisexual, hypogynous, pentamerous.  $K_{(5)}$ , quincuncial arrangement, inferior.  $C_{(5)}$ , lobes erect, inferior.  $A_{(5)}$ , epipetalous, anthers gynandrous, short, broad.  $G_2$ , apocarpous, unilocular, ovules many, styles 2, free. Fruit, an etaerio of follicles. Seeds numerous, broadly ovate, flat, minute, tomentose, with tuft of silky hair (Chopra, 1974; Hussain, 1987).

**Medicinal uses:** Alterative, tonic and diaphoretic and in large doses emetic, employed in numerous obstinate cutaneous diseases, syphilitic affections, dysentery, diarrhoea and chronic rheumatism (Bentley and Trimen, 1991).

### *Convolvulus arvensis* L.

**Family:** Convolvulaceae

**Vernacular name:** Lehli

**Description:** A wild weed in wheat and cotton fields. Root, tap root system, fibrous. Leaves alternate weak, herbaceous and cylindrical above. Leaves alternate, petiolate, exstipulate, base hastate, entire, acute, unicostate reticulate, glabrous. Flowers cymose,

bracteate, pedicellate, complete, regular, actinomorphic, hermaphrodite, pentamerous, hypogynous.  $K_{(5)}$ , imbricate, inferior.  $C_{(5)}$ , infundibuliform, short tube.  $A_{(5)}$ , eptepetalous.  $G_2$ , bilocular, two ovules in each locules. Fruit a capsule, opening by four valves. Seeds are albuminous (Chopra, 1974; Malik *et al.*, 1990).

**Medicinal uses:** It is used as purgative, makes catheter wide, contains convolvalin alkaloid. Root extract cooling and in anticonvulsions (Agarwal, 1997; Kumar *et al.*, 1997).

***Sesamum indicum* L.**

**Family:** Pedallaceae

**Vernacular name:** Til

**Description:** A cultivated annual herb. Root, tap root system. Stem, herbaceous, cylindrical. Leaves, opposite, entire, toothed, upper leaves are alternate. Flower, solitary, axillary, bisexual, zygomorphic, hypogynous.  $K_{(5)}$ ,  $C_{(5)}$ , tubular, obscurely, 2-lipped, (upper 2, lower 3).  $A_4$ , epipetalous.  $G_{(2)}$ , tetralocular, axile placenta on with one ovule in each loculus, style filiform, stigma bilobed. Fruit capsule. Seeds endospermic (Chopra, 1974; Hussain, 1987).

**Medicinal uses:** Leaves demulcent in cholera infest, as catarrh and infections of urinary ducts, emollient, in dysentery. Seeds laxative, also for dietary purposes and as an external application to soften the skin and used to clean and beautify the hair (Bentley and Trimen, 1991; Zhang, 1996).

***Dalbergia sissoo* L.f.**

**Family:** Papilionaceae

**Vernacular name:** Shisham

**Description:** A deciduous tree. Root, tap root system. stem woody, leaves alternate, reticulate, broader than longer, uncostate, stipulate. Flower racemose, bisexual, complete, zygomorphic, irregular, perigynous.  $K_{(5)}$ , inferior.  $C_5$ , descending imbricate.  $A_{(9)}$ ,  $G_1$ , unilocular, style long, stigma simple. Fruit in the form of pod, flattened, indehiscent. (Chopra, 1974; Soomro *et al.*, 1997).

**Medicinal uses:** Stem, wood extract alterative, useful in leprosy, antiseptic, applied on boils, skin eruptions, given internally in dilute form to ally vomiting. Bark, bitter stimulant, extract in gonorrhea. Roots astringent (Agarwal, 1997; Zhang, 1996).

***Ficus bengalensis* L.**

**Family:** Moraceae

**Vernacular name:** Burgad

**Description:** A large evergreen tree with branches horizontally spreading. Root, tap root system. Stem, erect glabrous, woody, cylindrical. Leaves evergreen, cauline, coriaceous, alternate, exstipulate petiolate, uncostate reticulate. Flower unisexual, monoecious. Male, perianth, 4 minute perianth, lenceolate. Androecium single, 2 anthers, two celled and versaltile. Female flower, perianth, 4, arranged in two whorls,  $G_{(2)}$ , unilocular, single pedulus. Fruit, sgconus i.e., multiple fruit (Chopra, 1974; Shinwari and Shah, 1995).

**Medicinal uses:** Latex good in wounds being antiseptic, bark as demulcent in diabetes, buds infusion in diarrhoea, growing tips in vomiting, fruits as emollient (Agarwal, 1997; Shinwari and Shah, 1995).

***Ficus religiosa* L.**

**Family:** Moraceae

**Vernacular name:** Peepal

**Description:** A large evergreen, glabrous and usually epiphytic tree. Root, tap root system. Stem woody, cylindrical, erect. Leaves ovate, narrowed upward, coriaceous, rounded, truncate, reticulate. Receptacles sessile, dark purple when ripe, basal bracts, broadly ovate-elliptic obtuse. Male flowers sessile.  $K_{2-3}$ , ovate, lanceolate.  $A_1$ , anther single. Female flower  $G_{(2)}$  and gall flowers sessile or pedicellate.  $K_{3,4}$ , lanceolate, gal flowers without perianth, stylke short, stigma round. Figs depressed, globose, dark purple on maturation (Chopra, 1974; Soomro *et al.*, 1997).

**Medicinal uses:** Leaves in stomach pain, digestive. Bark extract found good in vomiting. The buds paste in water, two tea spoons with milk or warm water before bed act as nervine tonic and found effective in neuralgia (Agarwal, 1997; Zhang, 1996).

***Melia azedarach* L.**

**Family:** Meliaceae

**Vernacular name:** Drek

**Description:** A medium sized deciduous tree. Root, tap root system. Stem erect, woody. Leaves are alternate, compound, imperipinnate, exstipulate. Flowers axillary panicle, zygomorphic, hypogynous, bisexual.  $K_{(5)}$ , lobed imbricate.  $C_5$ ,  $A_{(10)}$ , filaments united in a staminal tube, anthers erect, disc annular.  $G_{(3)}$ , 3-celled, style single, sigma disc form, ovules two. Fruit drupaceous, with one seed, honey scented white flowers (Chopra, 1974; Said, 1996).

**Medicinal uses:** Margosa or neem bark is generally regarded as antiperiodic and astringent tonic. It has been

employed with success in intermittent and other paroxysmal fevers, as astringent tonic in general debility and convalescence after febrile and inflammatory affections (Bentley and Trimen, 1991; Qureshi and Khan, 2001).

***Adhatoda vasica* Miller**

**Family:** Acanthaceae

**Vernacular name:** Bhekkar

**Description:** A wild shrub in sub-mountain region with tap root system. Stem herbaceous above and woody below. Leaves opposite, exstipulate. Flower spikes or panicles, small irregular zygomorphic, bisexual, hypogynous.  $K_{4-5}$ ,  $C_{5-5}$  imbricate.  $A_5$ , didynamous, epipetalous.  $G_{(2)}$ , two celled. Style simple, sigma two of unequal size. Fruit capsule. Seeds exalbuminous (Chopra, 1974; Shinwari and Shah, 1995).

**Medicinal uses:** Leaves are used in diarrhoea, dysentery, glandular tumours, in powder form for making skin ointment, as uterotonic, abortifacient, in hemorrhage, antifatigue drug. Flowers antiseptic essential oil. Roots decoction as expectorant in cough and chronic bronchitis and asthma (Agarwal, 1997; Maxted and Crust, 1995).

***Phyllanthus emblica* L.**

**Family:** Euphorbiaceae

**Vernacular name:** Amla

**Description:** A deciduous middle sized tree. Root, tap root system. Stem erect, woody, glabrous. Leaves sessile closely set along the branchlets, glabrous, narrowly linear, obtuse, stipulate, ovate. Flowers axillary with fimbriate bracts at the base, male flowers numerous on short slender pedicels.  $K_6$ , oblong-obtuse.  $A_3$ , on short central column. Female flowers, few, sub-sessile, sepals as in male, disk a lacerate cup. Ovary three celled, style connate irregular.  $G_{(2)}$ . Fruit fleshy, globose, with 6-obscure vertical, two seeded, crustaceous cocci, furrows pale yellow (Chopra, 1974; Bentley and Trimen, 1991).

**Medicinal uses:** Fruit use in about 65 preparations, contain ascorbic and citric acid contain vitamin C about 120 mg 100 g<sup>-1</sup> pulp. Also used in softening and strengthening the hair (Agarwal, 1997; Hussain, 1987).

***Salvia officinalis* L.**

**Family:** Labiatae

**Vernacular name:** Mahatita

**Description:** It is perennial herb with tap root system. Stem semi-shrubby at the base, branches numerous opposite. Leaves numerous erect cylinder, woolly,

petioles, margin involute in the bud, reticulate. Flowers on short pubescent stalk arranged in symes of three.  $K_2$ , upper with three triangular acuminate teeth, the lower with two teeth.  $C_2$ , bilobed.  $A_2$ , inserted in the upper part of the corolla-tube, filamentous short.  $G_2$ , ovary small, divided into 4 rounded lobes. Fruit consisting of four indehiscent, dull black achenes, sieves solitary in each achene (Chopra, 1974; Malik *et al.*, 1990).

**Medicinal uses:** Plant used as a gargle, and wash for the mouth, as a feeble tonic and astringent and as efficient aromatic, stimulant tonic in general debility and in weakness of digestion, as an antiemetic carminative and gentle stimulant to the stomach and bowels (Bentley and Trimen, 1991; Malik *et al.*, 1990).

***Olea europea* L.**

**Family:** Oleaceae

**Vernacular name:** Zaitoon

**Description:** A small much branched evergreen tree. Root, tap root system. Stem, slender greyish-white, nearly smooth. Leaves, opposite, lanceolate, acute, tapering to the base, entire. Flowers, branched racemes, numerous, small.  $K_4$ , cup shaped.  $C_4$ , oval, acute creamy white.  $A_2$ , inserted on the tube of the corolla. Anthers large, short filament. Fruit, a drupe with ovoid structure, deep purple or black, bony, one seeded. Seed, thin testa, membranous (Chopra, 1974; Malik *et al.*, 1990).

**Medicinal uses:** Olive oil is demulcent, laxative, used in affection of bowels and as an antidote in cases of poisoning, externally applied, preventing the oil effects produced by the sting of a wasp or bee, emollient, preventive of plague. Leaves, astringent, antiseptic, in levant in cases of fevers (Bentley and Trimen, 1991).

***Amaranthus viridis* L.**

**Family:** Amaranthaceae

**Vernacular name:** Chaulai

**Description:** An erect herb with alternate leaves, in axillary clusters and in slender axillary and terminal paniced spike-like racemes, bracteate and bibracteolate. Root, tap root system. Stem, herbaceous, cylindrical. Flowers, unisexual, monoecious.  $P_3$ ,  $A_3$ , in males. In the female,  $P_3$ ,  $G_{(2-3)}$ , unilocular with three stigmas and one erect ovule. Fruit, dry, one seeded, seeds small, lenticular, endospermic (Chopra, 1974).

**Medicinal uses:** Plant is used in snake bite. Leaves are emollient, paste applied on scorpion sting (alkaline).

Roots, as antifertility agent (Agarwal, 1997; Hussain, 1987).

***Eclypta alba* L.**

**Family: Compositae**

**Vernacular name: Bhangra**

**Description:** An annual herb. Root, tap root, branched and fibrous. Stem, soft, erect. Leaves alternate, exstipulate, simple, hairy. Flowers, a head or capitulum, sessile bisexual, actinomorphic. Calyx, reduced to a lowering or a fringe of scaly appendage.  $C_{(5)}$ , 5-lobed.  $A_{(5)}$ , epipetalous, filaments separate.  $G_{(2)}$ , unilocular, style simple, stigma bifid. Fruit, achenial. Seeds, ex-albuminous, with straight embryo (Chopra, 1974; Malik *et al.*, 1990; Hussain, 1987).

**Medicinal uses:** Used as emetic, purgative, tonic, alterative and applied externally as antiseptic to ulcers and wounds to the cattle (Kumar *et al.*, 1997; Bentley and Triman, 1991).

**Discussion**

A total of fifteen plant species from thirteen different families were studied. All the plants are angiosperm and dicot. Among them there are eight trees, two shrubs and five herbs. These plant species were selected on the basis of their constant demand and medicinally important constituents in these particular plants. Various parts of these plants are used in curing different ailments (Agarwal, 1997). During the research project it was noted that the medicinal plant wealth of Rawalpindi district is not fully exploited. Some medicinally important plant species are fast dwindling, mainly due to human interference (Hussain, 1987). So, the area needs proper protection for conservation and survival of bio-resources. The medicinal plants can be protected by conservation programmes with the help of local people (Said, 1996). Regular chemical screening of different medicinal plants and their useful parts collected from the fields in different seasons should be done. The oil bearing medicinal plants should be fenced for chemical and biological investigation, as well as for preventing overgrazing, cutting and use as fuel wood.

Moreover to prevent the extinction of medicinal species, efforts may be made to grow the sensitive species by acclimatizing them and if required protecting them *in situ* as many species can be considered as an asset for the human beings.

The live and dry herbarium of important medicinal plants species, maintained and seeds collected in the University

of Arid Agriculture, Rawalpindi will help to know and understand more about the inherent virtues of these plants and also will be helpful for the further references.

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