SOME INDIGENOUS HERBACEOUS DRUGS USED IN PHYTOTHERAPY IN PAKISTAN

Syed Riaz Baquar*

Abstract

The indigenous health care delivery system in Pakistan in based on an age old practice of using local herbs, which have been found to be very effective in treating various ailments 1-2. Most of these herbs have been in use since prehistoric times and the practice has little changed since then. Besides drugs of vegetable origin, those of animal and mineral origin are also used. Though the Graeco-Arab system of medicine is deep rooted in the subcontinent, other oriental and eastern system such as Chinese, Japanese and Korean are also slowly gaining ground, especially because of the scarcity and high cost of the western allopathic medicines.

25 indigenous drugs have been arbitrarily chosen to be highlighted and alphabetically arranged (Table 2).

A list of drugs, family and vernacular / english names have been provided by which they are sold in the local markets. This includes some very important herbs such as Apium graveolens, Anethum graveolens, Artemisia maritima, Onosma bracteatum, Peganum harmala, Sida cordifolia among other. Sida cordifolia is important because of the presence of sympathomimetic alkaloid which shows all the properties of ephedrine. Anethum graveolens is being used in Iran as a cure for cholesterol and the drug is now sold in the market under the name Anethum. Harmal (Peganum harmala) has many medicinal properties; the leaf decoction is recommended in rheumatism; seeds are hypnotic antiperiodic, emetic, lactagogic and anthelmintic; a decoction of the seed is administered in laryngitis.

Keyword:
Herbaceous drugs, phytotherapy

Introduction

Pakistan is a country of about 140 million people, distributed over an area of 796096 sq km, which represents various groups of ethnic, geographical and cultural background. In such a vast and varied ecological, socio-economic and environmental background herbal drugs have made a tremendous contribution towards alleviation of disease in the common man3-4. Not only in Asian but also in African and Latin American countries, the practice is becoming popular as well in Europe and America 5-6.

A great diversity of flora and fauna is found in the “Golden Crescent”, which lies between mountainous region of eastern Turkey and Afghanistan extending up to northern mountainous region of Pakistan and is considered as the site for the origin of several plant species of economic importance. Babylonians were aware of the medical value of a large number of plants of the region. The ancient Egyptians had ample knowledge of human anatomy as well as knowledge of the medicinal uses of many plants and animals. Excavation of the burial Site of Neanderthal man in Shanidar Cave in Iraq, in 1963, revealed the presence of the flowers of many plants of medicinal importance, which were kept in the grave 65000 years ago, along with the mummies, presumably as fumigants and insecticides. Several documents, treaties and picture writing have been discovered, one of the them known as the Eber Papyrus, discovered in the tomb of a mummy dating 1550 BC, throws light on the skill and knowledge of those people in the field of herbal medicine.

Antiquity of Herbal Drugs

The use of drugs started some 2500 years BC. Hippocrates

*Professor of Pharmacognosy and Editor-in-Chief, J. Baqai Med. Univ. BMU Karachi.
(460-370 BC), Aristotle (384-322 BC), Theophrastus (370-287 BC) and Dioscorides (1st Century AD) have left treatises which give us information about certain drugs that were in use at that time. The first Materia Medica describing 600 medicinal plants was written in 78 AD, which includes plants such as Opium, Hyoscyamus, Colchicum and Belladona, which are of use even now. The method of preparation of drugs was described by Galen (Jali Noos) in 2nd Century AD (131-200 AD) and dosage of many preparations as established by Al-Kindi (Yaqoob ibn Ishaq Alkindi-801 AD - 873 AD).

The World Health Organisation is presently taking a keen interest in indigenous resources of plants. This is because of the universal use of herbal drugs by rural people. According to a conservative estimate about 80% people in the countryside use herbal drugs, not only in the subcontinent but also in other parts of Asia, Africa and Latin America. If this system is properly developed and utilized the World Organization predicts that by 2010 a health care system will become available to all.

Man most probably learn the use of herbs from animals. Starting from dietary and nutritional plants the search must have extended to those herbs that could cure their diseases or improve their general health. Since man became conscious of his surroundings he must have looked for and registered useful plants and discarded those which he thought were of lesser use. There was an original hypothesis of the “Doctrine of Signature”, stating that God created plants for the benefit of man and in doing so, he left specific signs in them. For example, heart shaped leaves were of use, they thought, for heart diseases or kidney shaped seeds of beans, for use in kidney disease. The blood-coloured juice of pomegranate would be useful in blood diseases and so on. There is a long list of such plants which were quoted in support of the hypothesis. However, this concept was discarded later and has become of historical interest now. Over one thousand plants of medicinal use have been published before.

A few herbal drugs have been widely acknowledged and are used in local herbal and pharmaceutical industries, such as Digitalis, Rauwolfia, Ipecacuanha, Cinchona bark, Santonica or Worm wood, Stramonium, Asafoetida, among others. Their therapeutic value has been tested and verified. However a very large number, though used in herbal system, are less known and need to be emphasized and high lighted (Table 2).

**IMPORTANCE OF COLLECTION AND IDENTIFICATION**

For the better understanding of both macroscopic and microscopic characters it is necessary that the drug should be collected in its complete form. Each part of the drug forms important identifying characteristics and if any part is missing it may be rather difficult to identify the drug. Crude drugs are available in the market in various forms such as seeds, fruits, flowers, leaves or roots. Wood barks and roots or rhizomes may be brought to the market in broken, cut or sliced pieces. Sometimes they are matted together or in bales and may be pressed together or ground to powder. Often these are given different shapes. Roots, rhizomes and barks may be brought to the market after removal of the outer skin or periderm. Depending upon the availability, packaging facility and requirements, their shape may be cylindrical, sub-cylindrical, conical, fusiform ovoid, terete or disc shaped.

In this situation it may cause serious difficulty in identification unless the material is well known and can be identified by optical evaluation by its colour, texture or smell, such as ginger (rhizome), sotth (dried rhizome) Castor seed, clove (flower buds) among others.

It is not always that drugs are collected from known sources i.e. drug garden, raised and cultivated for this particular purpose, but may be collected from wild sources, in remote areas with considerable ecological variation. Such drugs may also develop a wide range of variation in their chemical constituents, depending upon the time of the year, day length or humidity, when collected. This means that it will also vary in its therapeutic effect, i.e. efficiency and potency. Ignorance on the part of the collector may cause faulty collection and may result into gathering of completely different material altogether, or a mixed article. Care should be taken that the drugs are collected at the right time and at the right stage of physical development.

**PHASE OF PHYSICAL DEVELOPMENT**

Drugs should be collected when their active principle is at its maximum. Different types of drugs i.e. root, leaves, flowers, seed, should therefore be collected at the right phase of their development and so general rules have to be formulated for collector of the drugs. As an example different parts should be collected usually according to the table given below.

<table>
<thead>
<tr>
<th>Part of the herb</th>
<th>Phase of development</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flower</td>
<td>when they are fully open</td>
</tr>
</tbody>
</table>
Fruit  
when fully grown (ripe) or in some cases when still unripe

Leaves  
during active photosynthetic activity

Seeds  
when fully ripe, (expert collector knows by looking at the seed, the stage of maturity)

Barks  
During spring before formation of annual growth rings

Root/Rhizome  
After the completion of vegetative growth. If collected early the material may shrink.

Table 2

**List of Herbs, Family and Vernacular / English Names**

<table>
<thead>
<tr>
<th>SPECIES</th>
<th>FAMILY</th>
<th>VERNACULAR / ENGLISH NAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>Achyranthus aspera L</td>
<td>Amaranthaceae</td>
<td>Charchita / Prickly</td>
</tr>
<tr>
<td>Achillea millefolium L</td>
<td>Compositae</td>
<td>Biranjas / Yarrow</td>
</tr>
<tr>
<td>Anethum graveolens L</td>
<td>Umbelliferae</td>
<td>Soya / Dill</td>
</tr>
<tr>
<td>Apium graveolens L</td>
<td>Umbelliferae</td>
<td>Ajmud / Wild celery</td>
</tr>
<tr>
<td>Aristolochia bracteolata Lamk</td>
<td>Aristolochiaceae</td>
<td>Sharmul / Birth wort</td>
</tr>
<tr>
<td>Arnebia hispidissima (Lelum) DC</td>
<td>Boraginaceae</td>
<td>Khari</td>
</tr>
<tr>
<td>Artemesia maritima</td>
<td>Compositae</td>
<td>Afsantin / Santonica, worm wood</td>
</tr>
<tr>
<td>Asparagus racemosus Willd</td>
<td>Liliaceae</td>
<td>Satawar / Asparagus</td>
</tr>
<tr>
<td>Dorema ammoniacum D. Don</td>
<td>Umbelliferae</td>
<td>Ushag / Gum ammoniacac</td>
</tr>
<tr>
<td>Doronicum roylei DC</td>
<td>Compositae</td>
<td>Darunaj / Leopard bane</td>
</tr>
<tr>
<td>Onosma bracteatum Wall</td>
<td>Boraginaceae</td>
<td>Ratanjot / alkanet root</td>
</tr>
<tr>
<td>Peganum harmala L</td>
<td>Zygophyllaceae</td>
<td>Harmal / Syrian rue</td>
</tr>
<tr>
<td>Phyllanthus niruri L</td>
<td>Euphorbiaceae</td>
<td>Haleej / Phyllanthus</td>
</tr>
<tr>
<td>Polygonum hydropiper L</td>
<td>Polygonaceae</td>
<td>Anjbar / bistort, water piper</td>
</tr>
<tr>
<td>Physalis minima L</td>
<td>Solanaceae</td>
<td>Aknaj / Alkangi</td>
</tr>
<tr>
<td>Pimpinella diversifolia (Wall) DC</td>
<td>Umbelliferae</td>
<td>Anis</td>
</tr>
<tr>
<td>Plantago ovata Forssk</td>
<td>Plantaginaceae</td>
<td>Ispagul / spogel</td>
</tr>
<tr>
<td>Rumex vesicarius L</td>
<td>Polygonaceae</td>
<td>Salun / sorel bladder dock</td>
</tr>
<tr>
<td>Sida cordifolia L</td>
<td>Malvaceae</td>
<td>Bala / country mallow</td>
</tr>
<tr>
<td>Thalictrum falconeri Lecoyer</td>
<td>Ranunculaceae</td>
<td>Piarranga / gold thread mamira</td>
</tr>
<tr>
<td>Trianthema pentendra L</td>
<td>Aizoaceae</td>
<td>Itsit</td>
</tr>
<tr>
<td>Trianthema portulacastrum L</td>
<td>Aizoaceae</td>
<td>Lalşabani, sathi</td>
</tr>
<tr>
<td>Tribulus terriristris L</td>
<td>Zygophyllaceae</td>
<td>Gokhru / Caltrop puncturevine</td>
</tr>
<tr>
<td>Trionumetta rhomboidea Jacq</td>
<td>Tiliaceae</td>
<td>Chikti</td>
</tr>
<tr>
<td>Tussilago farfara L</td>
<td>Compositae</td>
<td>Funjiworm / Colt’s foot</td>
</tr>
</tbody>
</table>
DESCRIPTION OF SOME IMPORTANT DRUGS AND THEIR THERAPEUTIC USES

Achyranthus aspera L:

A small erect herb, 30-90 cm tall with greenish white flowers, arranged in long rigid spike rapidly increasing during fruiting. The herb is available throughout Pakistan and flowers in April and August.

The herb is purgative, diuretic, astringent or emetic; used in dropsy, piles, skin eruption and colic; seed is emetic while root is astringent.

Achillea millefolium L

A strong scented perennial herb bearing runners; flowers inner yellow, outer white or pinkish, in ovoid shortly stalked head, 6 mm in diameter.

Herb is diaphoretic, stimulant, toxic, emenagogue, useful in cold, obstructed perspiration and commencement of fever.

Anethum graveolens L

An erect medium sized perennial aromatic herb with yellow flowers in compound umbels, oil glands, large solitary in each furrow.

Fruit is carminative, stomachic, essential oil from seeds is carminative and is useful in flatulence. Seed yields essential oil containing alpha or beta pinene terpene.

In Iran a preparation by the name “Anethum” is sold which is supposed to control high cholesterol level.

Apium graveolens L

A medium to large erect biennial herb with minute white flowers, leaves-radical pinnate with large deeply lobed segments; stem leaves deeply divided into three segments.

Root is alterative diuretic given is anasarea (edema with accumulation of serum in connective tissue), or colic. Seed is stimulant, chordial, toxic, carminative, diuretic emmenagogue, antiseptic, used in bronchitis, asthma, spleen disease and fever.

Plant contains essential oil glucose, aprin. Oil contains d-limonene, d-selinene, sedenonic acid and sedanolide (25-30%).

Arnebia hispidissima (Lehm) DC

A small diffused, very hispid annual or biennial herb with woody base providing many branches, flower bluish or yellow, dimorphic in dense spicate i-sided raceme.

Plant is commonly sold as medicinal herb by local vendors.

Artemisia maritima L

A shrub with slender, wiry, striate hairy or white woolly branches; leaves alternate, 1.3-5.0 cm long, flower heads homogenous, disciform, 3-8 flowered in spicate fascicles; flowers yellow.

Flower head is anthelmintic. Decoction or infusion of leaves used in ague, intermittent and remittent fever, also used in jaundice or in stomachache.

Plant contains essential oil, bitter substance, santonin.

Aristolochia bracteolata Lamk: (Syn: A. braeteata Retz)

A glabrous decumbent perennial herb, 30-60 cm long, leaves reniform or widely cordinate; perianth dark purple; fruit pyriform, 2-3 cm long.

Herb is emmenagogue, anthelmintic, purgative, juice of leaves applied to ulcer, eczema; root decoction used to remove roundworm.

Plant contains an alkaloid or a volatile substance.

Asparagus racemosus Wild

A tall spiny climber, stem annual, woody, terete; cladodes 1.3-2.3 cm long, in tuft of 2-6 curved; flower is solitary or fascicled simple or branched, racemes 2.6-5.0 cm long; perianth ca 3 mm long, berry 3-8 mm red.

Root is diuretic, demulcent, aphrodisiac, refrigerant, antiseptic, alterative, antisyntery and galactagogue.

Dorema ammoniacum D. Don:

A tall perennial shrub, 2-3 meters tall, stem base woody, umbells simple or branched; petals white, fruit elliptic to oblong, 6-8 mm long.

Oleo-gum resin is expectorant, antiseptic and stimulant, used in catarrah, asthma, chronic bronchitis, in enlargement of spleen and liver.
**Dornicum roylei DC:**

An erect medium sized to large perennial herb, leaves 10-12.5 cm long, broadly ovate, toothed with rounded notches; flower yellow in long slender stalked heads, 2.5-5.0 cm in diameter, pappus of inner flowers short, reddish pappus of outer flower none; achene top shaped and oblong deeply grooved.

Root is considered aromatic or toxic, used to prevent giddiness caused on ascending height.

**Onosma bracteatum Wall (Syn: O. macrocephala D. Don)**

A medium sized perennial herb, arising from a persistent cluster of basal leaves, 50 cm long; basal leaves lanceolate; inflorescence of terminal glomerate clusters, very dense, 4-10 cm broad in flowers, bracts hairy lanceolate, corolla blue or purple, nutlets grey, angulate.

The plant is refrigerant demulcent, alterative and toxic, used in rheumatism, syphilis, leprosy and heart disease, to relieve excessive thirst and restlessness in febrile excitement, irritation of bladder and stomach and strangury.

**Peganum harmala L**

A much branched, densely folioted herb, 30-60 cm tall with perennial root and annual stem, flowers 1.2-1.8 cm in diameter, white, solitary, sessile or stalked, in the axil of branches, sepals and petals 4-5, linear to oblong soon falling off, capsule 5-8 mm in diameter, lobed, splitting in 3 valves, seeds many.

The herb is emmenagogue, aphrodisiac, glactagogue and abortificient; seeds antispasmodic, hypnotic, antiperiodic, emetic, alterative, lactagogue, anthelmintic and narcotic, seed powder recommended as anthelmintic (against tapeworm); decoction of seed given in laryngitis, leaf decoction is given in rheumatism, root is applied to kill lice.

Seed and root contains several alkaloid, harmine, harmaline, harmalol and peganine among them. Flower and stem yield alkaloid peganine.

**Phyllanthus niruri L**

A glabrous annual herb 15-20 cm tall, leaves elliptic, ovate, oblong, membranous; flowers whitish, minute, sepals 5-6; capsule minute 1-2 mm depressed, globose, urino-genital disease, root used in jaundice, applied on sores, powdered leaves and roots are applied on sores, ulcers and swollen parts.

Dry leaves contain bitter principles hypophyllantine (0.05%) and phyllanthin (0.35%).

**Polygonum hydropiper L:**

A medium sized erect, annual herb, found in Swat. Gilgit, Hazara and Ladakh, usually flowering in February to August. Stem sometime prostrate rooting at joints, leaves 5.0-7.5 cm lanceolate or oblong-lanceolate, flowers pink or red, in drooping zigzag racemes, bract smooth with or without glands, tubular. stamen 6, nuts minutely dotted.

The herb and leaves are diuretic, stimulant, acrid and emmenagogue, used in amenorrhea and other uterine disorder, fish poison, root is stimulant, bitter tonic.

**Physalis minima L:**

An erect or suberect herbaceous annual weed, 15-45 cm tall, pubescent, leaves ovate, acute, sinuate, scarcely lobed 2.5-6.0 cm long flowers yellowing, 5 mm, across, calyx 4 mm long become enlarged enveloping the berry, presistent, berry yellow, 10 cm across. The herb is common in Karachi, lower Sindh, Khairpur, Indus Valley and Swat.

Fruits diuretic, toxic aperient, used for horses and gonorrhoea, juice of leaves mixed with water and mustard oil, is used as a cure for earaches.

*P. minima var indica* (R.&D.) Clarks, which has a larger more angled fruit is considered as diuretic, toxic and purgative. The plant is also used as an ingredient of a medicinal oil which is given for spleen disorder.

**Pimpinella diversifolia (Wall) DC.**

A large erect perennial herb, hairy or velvety, leaves pinnately compound; leaf 3 or 5 variable; bracts none or 1-2, 6-12 mm, linear, petals white, greenish, notched, fruits ovate to ovoid, 2 mm long, glabrous.

The herb is used as carminative.

**Plantago ovata Forsk:**

A villous stemless subacastlescent herb, leaves 7.5-22.5 cm long narow, filiform, lanceolate; scapes numerous larger or shorter than leaves, spike 1.2-5.0 cm long; flowers 6 mm long, capsule 2-celled, cell 1-seeded. Found throughout Pakistan, flowers in March-May.

Seeds are cooling, diuretic, demulcent, used in inflammatory
conditions of mucous membrane, chronic dysentery, diarrhoea and constipation.

Plant contains mucilage, seeds contains holoside plantose (0.168%)

*Rumex vesicarius* L:

A small, smooth, pale green annual herb, leaves 2.5-7.5 cm ovate or oblong, base wedge shaped, stipule tubular soon falling, flower small pink or white, male and female separate, in terminal short leaf opposed leafless racemes. Calyx of 6 circular sepals, stamen 6, nut 1.2 cm in diameter, 3 angled.

The herb is common on frontier, Sindh, Balochistan, Waziristan.

Juice is cooling astringent, diuretic, aperient, used in snake bite, seed is cooling used in dysentery and scorpion sting, leaves also cooling aperient, diuretic astringent.

*Sida cordifolia* L.

A small erect, downy, annual or perennial shrub, leaves 2.5-5.0 cm long ovate, crenate, downy, peduncle solitary in few flowers together, calyx 10-angled lobes ovate, corolla yellow slightly exceeding the calyx. The plant is common in plains of Sindh, Punjab, Swat, flowering throughout the year.

The plant is important because of the presence of sympathomimetic alkaloid which shows all the chemical and physical properties of *ephedrine*.

Plants used in rheumatism, gonorrhea, spermatorrhoea, locally applied in elephantiasis, leaves demulcent, used in ophthalmia, root astringent, stomachic, diuretic, alterative febrifuge and demulcent; seed considered aphrodisiac, laxative; demulcent, recomended in gonorrhoea, cystitis, tetanus, piles.

*Thalictrum falconeri* Lecover (Syn: *T. foliolosum* DG)

A large erect, smooth herb; leaves 15-45 cm, pinnate often with 3 leaflet, leaflet 10-20 cm oblong-ovate, 3 lobed, flowers green, white or purple, stamen larger than sepals achene 2-5, 5mm long. The herb is found in lower Pass, Murce, Changla Gali, 1600-2600m, flowers in March-July.

Root is diuretic, aperient, purgative, toxic, febrifuge good cure for atonic dyspepsia and an application of ophthalmia. Plant contains *barbarine* and *thalictrin*.

*Trianthema pentendra* L:

A common prostrate, perennial herb, woody, leaves 2.5-5.0 cm long, oblong elliptic, flowers in sessile clusters, calyx lobes ovate, stamen 5 capsule beak consisting of two lanceolar portions, separating into 2 seeded plants.

The herb is found throughout Pakistan, Karachi to Hazara. Root is irritant and cathartic, astringent in abdominal diseases, abortifacient and remedy for pain in bladder, for snake bite.

Another species *T. portulacastrum* is also medicinally important and is found throughout Pakistan from Karachi to Swat. Root is cathartic, irritant, abortifacient, used in menorrhoea; leaves are diuretic, recommended in oedema and dropsy.

*Tribulus terrestris* L.

A prostrate hairy annual or biennial herb, silky, branches 30-60 cm, leaves abruptly pinnate, 1.2-2.5 cm, flowers yellow, 8-18 mm in diameter, petal 5, soon falling; stamens 10, fruit 5-angled, 5-12 cocci with 2 long 2 short spines. The herb is found throughout Pakistan upto 3600 meters. The herb is cooling, diuretic, dimulcent, toxic, aphrodisiac and aperient, fruit used in painful micturation, urinary disorder, impotence, cough, heart disease; seed recommended in haemorrhagia, disease of bladder, kidney stone and gout.

*Triumfetta rhomboidea* Jacq (Syn: *T. bartramia* L.)

An erect large herb or shrub under 60-150 cm high, smooth or velvety; leaves 5-8.8 cm by 3.8-7.5 cm, polymorphous, broadly ovate or 4-angled, flowers 6 mm across yellow in dense terminal and leaf opposed cymes; petal 5; capsules 5-6mm in diameter, rounded or ovoid, white felted prickly spine 2-3 mm hooked, seeds 1-2 in each cell. The herb is found in plains to 1400 m; Swat, Hazara, Abottabad, Jehlum Valley and flower in July to October.

Bark and fresh leaves are used in dysentery and diarrhoea; leaves flower and fruit are mucilaginous, astringent and demulcent, given in gonorrhoea; root is bitter, diuretic; a hot infusion is taken to facilitate child bath or to hasten the inception of parturition.

*Tuissilago farfara* L:

A small perennial dandelion like herb found near water channels, 1000-3700 m, in Murree, Hazara, Chitrak, Swat, Gilgit, Pooch.
Root stock has runners, leaves also radical, coming after the flowers, 7.5-25 cm long; flowers bright yellow, in solitary head 2.5-3.8 cm in diameter on felted leaflets stalks, male flowers surrounded by 300 female ligulate flowers, female flowers mature before male.

Leaves are demulcent, smoked in pulmonary complaints; roots and leaves are used in chest complaints asthma and bronchitis. Leaves contain mucilage and bitter glucoside.

REFERENCES:


2) Baquar SR. The role of phytotherapy as an alternative medicine in Primary Health Care J. Baqai Medical University 2003 (12): 22-24.


8) Baquar SR. and Tasnif M - Medicinal Plants of Southern West Pakistan, PCSIR Monograph No 3 1967.

