

## Nutritional and Ethnomedicinal Potential Plants of the Qur'an: An overview -VI

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### Abstract

Our ancient literatures of Hindus', Muslims as well as of Cristian's are full of plants described about their nutritional and medicinal potential. A significant number of plants described in their texts are still unidentified because of least or no interest in plant taxonomy among neither graduate scientists in well-developed different organisations nor respected teachers of Universities or Colleges of repute. We can say with confidence that there are no teachers who can teach Plant Taxonomy in significant numbers of academic institutions. A man of Biotechnology can do nothing if he/she cannot identify the plant on which the work has to be worked out. As a result, due to non-identification of plants we cannot use our wealth of knowledge which has been provided by our ancestors present in form of scripts.

We were presented a book written by Dr. M. I. H. Farooqi entitled "QuruaniPoudhe-VagayanicDhristi Se" while in Seminar organised by UP Biodiversity Board, Lucknow. We found that there are seventy-one plants being reported in Holy Qur'an and Bible. We have consulted the literatures available as well as the tribal of Bahraich about the uses of the plants available. The perusal of the alphabetical list of plants of Holy Qur'an reveals that there are 71 plant species representing 48 genera of 30 families. Brassicaceae, Cucurbitaceae and Moraceae family were found to be the biggest family represented by 6 plant species each whereas Caesalpiniaceae, Papilionoideae and Poaceae with 5 plant species each; Rosaceae and Rhamnaceae with 4 plant species; Mimosaceae, Liliaceae, Pinaceae, Euphorbiaceae, Oleaceae, Lytharaceae, Lamiaceae and Arecaceae with 2 plant species and rest fourteen species viz., Malvaceae, Asclepiadiaceae, Lauraceae, Bixaceae, Dipterocarpaceae, Juglandaceae, Cupressaceae, Lecnoraceae, Loranthaceae, Anacardiaceae, Sterculiaceae, Ericaceae, Salvadoraceae, and Vitaceae is being represented by single plant species each.

**Key words:** Ethnobotanical; Ethnomedicinal; Potential; Plants; Qur'an.

### Introduction

Herbal Medicine is the oldest form of medicine known to mankind. It was the mainstay of many early civilizations and still the most widely practiced form of medicine in the world today,

Ethnobotany is one of the most interesting themes of economic botany which might have first of all came into the existence probably when earliest man of "stone age" observed the animals mostly

the apes and monkeys eating certain plants or plant parts ex. Fruits, leaves and even inflorescences to satisfy their hunger. Therefore, on the basis of plants usage first of all by animals and later on by the human beings the concepts of Ethnobotany and Ethnozoology were evolved, which merged into a common term known as Ethnobiology. However, the term Ethnobotany was first of all used in the last of 19th century by J. W. Harsh Berger (1895) to indicate the interrelationship of plants with aboriginal people or tribal societies [Trivedi and Sharma, 2011]. In many parts of the world, wild plants are obtained from forests or wild areas designated for extractive resources and managed by local communities [Jadhav et al., 2011]. Wild edible plants provide food quantity as well as medicines [Patale et al., 2015].

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India is one of the twelve mega-biodiversity countries of the World having rich vegetation with a wide variety of plants. As per the 2001 census, the tribal population of India is 8.43 crore, constituting 8.2% of total population of the country [Annual Report, 2005-2006]. With enormously diversified ethnic groups and rich biological resources, India represents one of the great emporia of ethnobotanical wealth [Pal, 2000]. Even today, tribal's and certain local communities in India still collecting and preserving locally available wild and cultivated plant species for their day today life [Mahishi et al., 2005 and Ayyanar et al., 2010].

We were presented a book written by Dr. M.I.H. Farooqi entitled "QuruaniPoudhe-VagayanicDhristi Se" while in Seminar organised by UP Biodiversity Board, Lucknow. We found that there are seventy-one plants being reported in Holy Qur'an and Bible. We have consulted the literatures available as well as the tribal of Bahraich about the uses of the plants available. The perusal of the alphabetical list of plants of Holy Qur'an reveals that there are 71 plant species representing 48 genera of 30 families.

Brassicaceae, Cucurbitaceae and Moraceae family were found to be the biggest family represented by 6 plant species each whereas Caesalpiniaceae, Papilionoideae and Poaceae with 5 plant species each; Rosaceae and Rhamnaceae with 4 plant species; Mimosaceae, Liliaceae, Pinaceae, Euphorbiaceae, Oleaceae, Lytharaceae, Lamiaceae and Arecaceae with 2 plant species and rest fourteen species viz., Malvaceae, Asclepiadiaceae, Lauraceae, Bixaceae, Dipterocarpaceae, Juglandaceae, Cupressaceae, Lecnoraceae, Loranthaceae, Anacardiaceae, Sterculiaceae, Ericaceae, Salvadoraceae, and Vitaceae is being represented by single plant species each. We have enumerated five plants viz., *Acacia nilotica*, *Acacia senegal*, *Acacia seyal*, *Alhigimaurosum* and *Allium cepa* in first part and eight plants viz., *Allium sativum*, *Astragaluhadscendens*, *Bombax ceiba*, *Brassica arabica*, *Brassica juncea*, *Brassica nigra*, *Brassica rapa* and *Brassica schimperii* in second part, in third part seven plants viz., *Butea monosperma*, *Calotropis gigantea*, *Cedrus libani*, *Cedrus deodara*, *Cerantonia siliqua*, *Cinnamomum camphora* and *Citrullus colocynthis*, in the fourth part eight plants viz., *Cochlospermum religiosum*, *Cucumis melo*, *Cucumis utilisimus*, *Cucurbita pepo*, *Cydonia vulgaris*, *Dryobalamops aromaticum*, *Euphorbia resinifera* and *Ficus benghalensis*. and in fifth part nine plants viz., *Ficus carica*, *Ficus elastica*, *Ficus racemosa*, *Ficus religiosa*,

*Ficus rumphi*, *Fraxinus ornus*, *Hordeum vulgare*, *Juglans regia*, *Juniperus oxycedrus*. In the present sixth part we are enumerating fourteen plants viz., *Lagenariasiceraria*, *Lagenaria vulgaris*, *Lawsonia inermis*, *Lacnoraaffinis*, *Lensculinaris*, *Lens esculenta*, *Loranthus acacia*, *Ocimum basilicum*, *Ocimum sanctum*, *Olea europaea*, *Panicum miliaceum*, *Phoenix dactylifera*, *Phoenix Sylvestris* and *Pistacia vera*. The present review is an attempt to compile most of the information available regarding the distribution, cultivation, phytochemical characteristics, Ayurvedic properties, ethno-pharmacological, medicinal and non-medicinal uses of the plants.

### Enumerations

**Lagenariasiceraria** (Molina) Standl. Bottle Gourd, Lauki, Calabash plant (Cucurbitaceae):

### Synonyms

#### *Lagenaria vulgaris*

The plant, *Lagenariasiceraria* is a common fruit vegetable used throughout the India. *Lagenariasiceraria* is an annual climber growing to 9 m at a fast rate. It is hardy to zone (UK) 10 and is frost tender. It is in flower from August to September. The species is monoecious (individual flowers are either male or female, but both sexes can be found on the same plant) and is pollinated by Insects.

*Lagenariasiceraria* is 7.9-15.5 cm long, elliptical shaped having entire margin and parallel venation. The apex of the plant is acute having leathery surface with firm texture, dark green colour, bitter taste and characteristic odour.

Suitable for: light (sandy), medium (loamy) and heavy (clay) soils and prefers well-drained soil. Suitable pH: acid, neutral and basic (alkaline) soils. It cannot grow in the shade. It prefers moist soil.

The transverse section of *Lagenariasiceraria* leaf showed upper epidermis consists of elongated parenchymatous cells, covered by cuticle. The upper epidermis shows few stomata, which are of amniocytic type. Lower epidermis contains elongated wavy walled parenchymatous cells covered by cuticle. Number of covering and collapsed trichomes are present, while very few glandular trichomes are also present. Palisade cells are present at upper and lower epidermis. Mesophyll is made up of 3-4 layered chloroplasts containing, compactly arranged, oval to circular cells. It is interrupted by vascular bundles of various sizes. Vascular bundles are

surrounded by 2-3 layered sclerenchyma; they are conjoint, collateral and closed. Xylem is placed towards upper epidermis and phloem towards lower epidermis [Shah and Seth, 2010].

### **Phytochemicals**

Alkaloids, phenols, tannins, flavonoids and steroidal compounds are known in the genus.

The phytochemical analysis of edible portion of the fruit it is shown that it is a good source of glucose and fructose. The amino acid composition of the fruit is as leucine's; phenylalanine; valine; tyrosine; alanine; threonine; glutamic acid; serine; aspartic acid; cystine; cysteine; arginine; and proline.

The fruit is a good source of vitamins B and a fair source of ascorbic acid. Bitter fruits yield 0.013% of solid foam containing cucurbitacin's B, D, and H, mainly cucurbitacin B. These bitter principles are present in the fruit as aglycones.

Leaves contain cucurbitacin B and roots, cucurbitacin's B, D and E [The Wealth of India, 2004]. Phytochemical screening of the fruit revealed two steroids were isolated from the petroleum ether fraction and they were identified as fecosterol and campesterol [Shirwaikar and Sreenivasan, 1996]. Sugar and phenolic content of the fresh product was assayed, providing a partial nutritional characterisation of this vegetable. Glucose and fructose and traces of sucrose were found; in addition, a small amount of unidentified mono- and dicaffeoylquinic acid derivatives was detected [Calabrese, 2000].

HPLC analysis of extract of flowering plant of *Lagenariasiceraria* shows presence of flavone-C glycoside [Baranowska and Cisowski, 1994]. A water-soluble polysaccharide, isolated from fruiting bodies of *Lagenariasiceraria*, is composed of methyl- $\alpha$ -D-galacturonate, 3-O-acetyl methyl- $\alpha$ -D-galacturonate, and  $\beta$ -D-galactose in a ratio of nearly 1:1:1. This polysaccharide showed cytotoxic activity in-vitro against human breast adenocarcinoma cell line (MCF-7) [Ghose et al., 2009]. It is also reported to have content more proportion of soluble dietary fibres (SDF) than insoluble fibres.

SDF are having profound effect in lowering serum cholesterol, which also reveals that the pectin is predominant component of soluble fibres in *Lagenariasiceraria* fruits [Chang et al., 1995]. Peroxidase and polyperoxidase activity in relation to its blanching period and total enzymatic inactivation of blanched sample (i.e., residual peroxidase activity is less than one) is also reported in 180 seconds.

The seed of *Lagenariasiceraria* is also a good nutritive agent which contains vitamins, minerals, amino acids along with saponins and essential fixed oils and the seed is also used in dropsy and in worm infections [Rahman, 2003; Warriar and Nambiar, 1995]. There are two triterpenoids isolated from its fruit 22-Deoxocucurbitacin D and 22-Deoxoisocucurbitacin D [Enslin et al., 1967] and some more compounds which have been isolated from the fruits of *Lagenariasiceraria* like oleonic acid,  $\beta$ -sitosterol, campesterol, isoquercitrin [Gangwalet al., 2010].

### **Ethnobotanical Potential**

Immature fruits are cooked and used as a vegetable [Hedrick, 1972; Vilmorin, 1981; Huxley, 1992]. They can be boiled, steamed, fried, used in curries or made into fritters [Facciola, 1990]. Of variable quality, but some of the selected cultivars from India and China are of very good quality, equivalent to good summer squashes [Facciola, 1990]. The pulp around the seed is purgative and should not be eaten [Uphof, 1959]. The fruit can be dried for later use [Organ, 1963]. Leaves and young shoots - cooked and used as a potherb [Stuart, 1979; Facciola, 1990]. Seed - cooked. Rich in oil, it is added to soups etc [Facciola, 1990]. A vegetable curd, similar to tofu, can be made from the seed [Facciola, 1990]. An edible oil is obtained from the seed. It is used for cooking [Kunkel, 1984; Facciola, 1990]. Yields of up to 45% have been obtained [Chopra et al., 1986].

The tribal communities (Koyas, Gutti Koyas, and Lambadas) located in the northern Telangana zone use the dry hard shells of bottle gourd fruits for various purposes. Bottle gourd is variously referred as sorakaya, anapakaya, anapakaya, burrakaya, and tumri in the vernacular language by the tribal communities.

Domestic utensils like bottles, bowls, milk pots, spoons, and containers of several types are made out of the dried shells. It is a common sight everywhere in the tribal dominated pockets of Khammam district that the ethnic groups are mainly using the dry shells for carrying country liquor (mahua drink, toddy), honey, and water.

In some of the pockets it is being used for making stringed and wind musical instruments and pipes. At few places, the natives use the dried shells as floats on water bodies as well. Though it is nutritionally less calorific, tribals prefer bottle gourd as a vegetable for preparation of curries and pickles [Rood, 1994; Chittendon, 1951; Summit and Widess, 2007].

### *Ethnomedicinal Potential*

Traditional uses of bottle gourd (*Lagenaria siceraria*) show that the fruits are used as a general tonic, a cardiogenic, and a cardioprotective drug. In addition, it has also been used as an aphrodisiac, a diuretic, an antidote to certain poisons and scorpion stings, and an alternative purgative. Bottle gourd contains rich amounts of carbohydrates, dietary constituents, minerals, vitamins, and amino acids. It is also reported that the bitter principle of Cucurbitaceae such as the triterpenoid cucurbitacin's, B, D, G, H, and 22-deoxycucurbitacin, are also present in the fruit. Pharmacological and toxicological research carried on *L. siceraria* has confirmed the pharmacotherapeutic potential and safety profile of this wonderful natural herb. The anti-asthmatic and anti-allergic activity of the aqueous extract of leaf of *L. siceraria* was evaluated in different animal models. It is reported that the triterpene bryonolic acid, an anti-allergic compound, was isolated from callus culture of the roots of *L. siceraria* [Debjaniet al., 2017].

The fruits, leaves, stem, seeds and oil of *Lagenaria siceraria* are traditionally used in the treatment of jaundice, diabetes, ulcer, piles, colitis, insanity, hypertension, congestive cardiac failure, and skin diseases.

The fruit pulp is used as an emetic, sedative, purgative, cooling, diuretic, ant bilious, and pectoral.

Extracts of the plant have shown antibiotic activity.

Leaf juice is widely used for baldness [Kirtikar and Basu, 2005; Rahman, 2003; Duke and Ayensu, 1985].

*Lagenaria siceraria* juice is an excellent remedy for heart problems, digestive and urinary disorders, and in diabetes.

Dietary fibre present in *Lagenaria siceraria* helps in constipation, flatulence, and even in piles.

Topical application of a mixture of *Lagenaria siceraria* juice and sesame oil on scalp gives beneficial results in baldness (hair loss).

The juice also shows better effects in the treatment of insomnia, epilepsy, and other nervous diseases, moreover it helps break up calculus (stones) in the body.

In summer or hot conditions, *Lagenaria siceraria* juice prevents excessive loss of sodium, satiating thirst, and giving a cooling effect [Rahman, 2003].

The Koya community uses the fruits of the wild types for medicinal purposes (purgatives). Probably,

the bitter principle found in the wild bottle gourds is responsible for the purgative property. The pulp around the seed is emetic and purgative [Uphof, 1959; Stuart, 1979; Manandhar, 2002].

A poultice of the crushed leaves has been applied to the head to treat headaches [Moerman, 1998]. The flowers are an antidote to poison [Duke and Ayensu, 1985]. The stem bark and the rind of the fruit are diuretic [Duke and Ayensu, 1985]. The fruit is antilithic, diuretic, emetic and refrigerant [Stuart, 1979; Duke and Ayensu, 1985].

The juice of the fruit is used in the treatment of stomach acidity, indigestion and ulcers [Manandhar, 2002]. The seed is vermifuge [Duke and Ayensu, 1985]. A poultice of the boiled seeds has been used in the treatment of boils [Moerman, 1998].

Taken with *Achyranthes* spp the seed is used to treat aching teeth and gums, boils etc [Duke and Ayensu, 1985]. Extracts of the plant have shown antibiotic activity [Duke and Ayensu, 1985].

In many parts of China 3 grams per day of this species (the report does not say what part of the plant) has been used as a single treatment for diabetes mellitus [Duke and Ayensu, 1985].

*Lagenaria vulgaris* Ser. (Cucurbitaceae):

*Lagenaria vulgaris* Ser. is a synonym of *Lagenaria siceraria* (Molina) Standl.

The record derives from WCSP (in review) (data supplied on 2012-03-23) which reports it as a synonym with original publication details: *Memoires de la Société de physique et d'histoire naturelle de Genève*. 3(1): 25 1825.

*Lawsonia inermis* Linn. Henna plant, Mehdi (Lythraceae):

*Lawsonia inermis* is a much-branched glabrous shrub or small tree 2-6 m in height, which may be spiny. Bark greyish-brown, unarmed when young, older plants with spine-tipped branchlets. Young branches quadrangular, green but turn red with age.

Leaves opposite, entire, subsessile, elliptic to broadly lanceolate, 1.5-5 x 0.5-2 cm, glabrous, acuminate; veins on the upper surface depressed.

Flowers small, white, numerous; in large pyramidal terminal cymes, fragrant, 1 cm across, 4 petals crumpled in the bud. Calyx with 2-mm tube and 3-mm spread lobes; petals orbicular to obovate, white or red; stamens 8, inserted in pairs on the rim of the calyx tube; ovary 4 celled, style up to 5 mm long, erect. Fruits small, brown, globose capsules 4-8 mm in diameter, many-seeded, opening

irregularly, split into 4 sections, with a persistent style. Seeds 3 mm across, angular, with thick seed coat. The specific epithet means unarmed or without spines. Birds feed on the fruits of *L. inermis* and probably disperse the seeds.

*L. inermis* is widely distributed throughout the Sahel and into Central Africa; it also occurs in the Middle East. It grows mainly along watercourses and in semi-arid regions and is adapted to a wide range of conditions. It can withstand low air humidity and drought. Henna requires high temperatures for germination, growth and development.

Mean annual temperature: 19-27°C, Mean annual rainfall: 200-4200 mm.

It prefers sandy soils but can tolerate clays and poor, stony, sandy soils; optimum soil pH is 4.3-8.

It is native to Algeria, Cyprus, Egypt, Eritrea, Ethiopia, Indonesia, Iran, Iraq, Jordan, Kenya, Kuwait, Lebanon, Libyan Arab Jamahiriya, Malaysia, Morocco, Oman, Philippines, Qatar, Saudi Arabia, Syrian Arab Republic, Tanzania, Tunisia, Turkey, Western Sahara, Yemen

It is an exotic species for Australia, Benin, Burkina Faso, Cameroon, Central African Republic, Chad, China, Congo, Cote d'Ivoire, Democratic Republic of Congo, Gabon, Gambia, Ghana, Guinea, India, Liberia, Mali, Mauritania, Niger, Nigeria, Pakistan, Senegal, Sierra Leone, Spain, Sudan, Togo, Zanzibar.

### ***Ethnobotanical Potential***

**Fodder:** Leaves of *L. inermis* are browsed by livestock.

**Fuel:** Henna is a suitable source of firewood.

**Timber:** The wood of henna is fine grained, hard, and is used to make tent pegs and tool handles in India.

**Fibre:** In Turkana, Kenya, the stems are used for making fishing baskets.

**Tannin or dyestuff:** An orange-red dye is made by crushing the leaves and younger shoots to a grey-green powder. The powder is soaked in a mixture of strong tea and lemon juice and is used in Sudan, Middle Eastern countries and many Muslim communities in Africa for decorating hands, nails and feet with patterns. Henna is also used as a hair dye and conditioner as well as a colouring agent for leather and cloth. It may also be used to stain wood.

Trees are employed in soil conservation to check soil erosion.

*L. inermis* can be grown as a live fence as well as for shade/shelter.

It is an attractive small tree that can be successfully grown in gardens.

*Lawsoniainermis* Linn. (Lythraceae) is a very useful medicinal plant in all parts of the world. The leaf powder of henna sap is used for staining hair, nails and beard (Chengaihet al., 2010). The leaves of *Lawsoniainermis* are used to treat poliomyelitis, measles among the Yoruba tribe of South Western Nigeria (Oladunmoye and Kehinde, 2011). The seeds of henna have been reported to possess deodorant action and are used in most cases of gynecological disorders such as menorrhagia, vaginal discharge and leucorrhoea (Nawagishet al., 2007).

The leaves of *Lawsoniainermis* with those of *Hibiscus rosa-sinensis*, *Ecliptaprostrata* and seeds of *Abrus precatorius* when they are taken in equal quantities and ground into paste which is soaked in sesame oil for 5 days is used as hair oil by the tribes of Andhra Pradesh, India (Suneetha et al., 2011). In Turkey, henna which is an extract of *Lawsonia* sp. is used as hair dye and nail dye in many cultures as decorative dye centuries (Ozaslanet al., 2009). Henna is widely used in the cosmetic industry as dyeing agent also in India (Chengaihet al., 2010). Reports show that methanolic root extracts of

*Lawsonia* is used in Nigeria for cosmetic purposes, as antimalarial (Idowu et al., 2010) as well as for abortifacient purposes (Aguwa, 1987). The powdered roasted seed is mixed with gingerly oil to make a paste which is used for the treatment of ring worm. Decoction of the leaves is used for aseptic cleaning of wounds and healing (Kumari et al., 2011). *L. inermis* is also used by some individuals as 'blood tonic', thus implying its multifaceted use (Idowu et al., 2010).

Roots are regarded as a potent medicine for gonorrhoea and to enhance fertility in women; a decoction of them is considered to be diuretic or for treating blennorrhoea and pectoral for bronchitis. A reported constituent of the leaves is an ox naphthoquinone called lawsone, which has antibiotic properties.

Flower oil contains alpha- and betaionone, the latter being the main component.

Leaf and flower infusions are applied externally for ulcers and rheumatism or are taken orally for tetanus, epilepsy and stomach pains.

Leaves are used in treatment of leprosy, jaundice and scurvy.

Astringent roots are ground and rubbed on the heads of children to treat boils and eye diseases.

In Malaysia, fresh bruised leaves are used as poultices to relieve a burning sensation of the feet; to treat beriberi, skin diseases, boils, circumcision wounds and distension of the stomach; a decoction can also be gargled to treat gum boils, or prescribed to relieve abdominal pains after childbirth.

It is an emmenagogue and an abortifacient. In Indonesia, a paste of the leaves is applied for diseases of the fingernails and for herpes infection; tea made from the leaves is said to be taken to prevent obesity, and an ointment made from very young fruits treats itches.

In the Philippines, flowers are reported to be soporific.

The fragrant flowers are used as perfume, while small twigs are used as toothbrushes in Indonesia [Orwaet al., 2009].

Henna has a common traditional usage throughout the world. Due to its palliative, curative and healing effects, it is a famous medicinal plant in most cultures.

Lacanoraaffinis Eversm. Crab's eye (Lecanoraceae):

The location of the plant is Africa, Egypt, Sinai Desert [Schallert, 1990].

It is a famine food.

*Echeveria affinis* is evergreen, low-growing, perennial succulent, up to 20 cm tall and wide. The leaves are fleshy, olive-brownish, up to 5 cm long and up to 2 cm wide, formed on rosettes. The red star-shaped flowers sprout on a stem during the summer.

*Lens culinaris* Medik Lintil, Massor (Fabaceae):

### Synonyms

*Lens esculenta* Moench

*Lens culinaris* is an annual growing to 0.5 m.

It is not frost tender. The species is hermaphrodite and is pollinated by Cleistogomy (self-pollinating without flowers ever opening). The plant is self-fertile.

### It can fix Nitrogen

Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: acid, neutral and basic (alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil.

It is found in Afghanistan, Africa, Albania, Algeria, Argentina, Asia, Australia, Austria, Bangladesh, Britain, Bulgaria, Burma, Central Europe, Chile, China, Colombia, Czech Republic, East Africa, Ecuador, Egypt, Eritrea, Ethiopia, Europe, Fiji, France, Germany, Greece, Guatemala, Himalayas, Hungary, India, Indochina, Indonesia, Iran, Iraq, Israel, Italy, Japan, Jordan, Kenya, Lebanon, Libya, Madagascar, Malawi, Malaysia, Mauritius, Mediterranean, Middle East, Morocco, Mozambique, Myanmar, Nepal, Netherlands, New Zealand, North Africa, North America, Pacific, Pakistan, Philippines, Portugal, Reunion, Romania, Saudi Arabia, SE Asia, South Africa, Southern Africa, South America, Spain, Sri Lanka, Sudan, Switzerland, Syria, Tajikistan, Tanzania, Tasmania, Thailand, Tunisia, Turkey, USA, Vietnam, Yemen, Zimbabwe,

Seed are cooked or sprouted and eaten raw [Chittendon, 1956]. A very nutritious food [Hill, 1952; Kunkel, 1984], the seeds can be cooked on their own or added to soups, stews etc [Facciola, 1990]. The seed can be soaked for 12 hours in warm water and then allowed to sprout for about 5 days [Phillips and Foy, 1990]. They have a crunchy, fresh flavour [Phillips and Foy, 1990]. Lentils are more digestible than many legumes [Ken Fern]. The dried seed can also be ground into a powder and used with cereal flours in making bread etc [Facciola, 1990], this greatly enhances the value of the protein in the bread. The seed stores better if it is left in its husk [Huxley, 1992]. Young seedpods are used fresh or cooked like green beans [Usher, 1974; Kunkel, 1984; Facciola, 1990].

The seeds are mucilaginous and laxative [Choparaet al., 1986]. They are considered to be useful in the treatment of constipation and other intestinal affections [Choparaet al., 1986]. Made into a paste, they are a useful cleansing application in foul and indolent ulcers [Choparaet al., 1986].

*Lens esculenta* Moench

*Lens esculenta* Moench is a synonym of *Lens culinaris* subsp. *culinaris* Medik.

The record derives from ILDIS which reports it as a synonym (record 7785).

*Loranthus acacia*

### *Plicosepalus acacia*

*Loranthus acacia* grows in desert regions, where it mostly leeches onto several species of Acacia trees, though it may be found on other plants it

is also occur at agricultural area, natural forests, riparian Zones, Ruderal, Urban areas and wet lands. It is found mainly in East Africa, and the Sudan and it can also be found in Israel; Israel is the most northern spot it can be found.

Loranthaceae is a semi-parasitical plant, which means that it produces its own sugars, but takes water, minerals and nutrients (mostly nitrogenous) from its host. Its growth cycle depends solely on one species of bird pollinator – the Orange Tufted Sunbird (*Nectarinia Osea Osea*). The Loranthus produces nectar-rich elongated red flowers (the tubular corolla is 40 mm long) which function as an oasis for the Honey-Sucker birds which pollinate it as they drink its nectar, as well as for bees who try to steal nectar from the little holes the birds puncture on the side of the flower. Apparently, the flowers turn completely red after pollination (when nectar is no longer produced) and the Sunbirds are attracted to the flower while it is still green.

This is a strange post-pollination phenomenon since Honey-Suckers can see red and are attracted to red which usually indicates the presence of nectar. After pollination, the plant produces red fleshy fruits, which are eaten by yet another bird, mainly Bulbuls, and these seeds are dispersed with the birds' excretion (the seeds aren't harmed while passing via the birds' intestinal tract – presumably by accelerating their digestive system). The fruit can also adhere to the birds' beaks and as they try to remove it (by rubbing their beaks on the branches), the sticky seeds stick to branches. The seeds germinate immediately on the substance they were deposited on, regardless of location, and try to strike roots. If a seed was not deposited on the right tree or was unable to set roots - it will quickly dry out and perish. Whenever the seed does manage to germinate, it sends absorbing roots-like organs (haustoria) that extend through the inner layers of the branches' host, where most of the water transport occurs.

After a while it merges completely with it. Other roots get interlocked around the host's branch in order to fasten their grip. The Loranthus creates a mass on the host's branches; it is always above ground, never touching the ground, feeding solely through its host. Henceforth, it grows, producing a mass of succulent fleshy leaves, availing itself of the host's water and mineral supply, regardless of the austerity and modesty usually mandated by the desert climate. If the Loranthus' masses of growth on the tree multiply too much, then at a certain point this brings an end to the tree as well as to

itself. Deep scars will remain on the tree, marking the penetration holes of the Loranthus' suckers.

This life cycle resembles that of the *Viscum Album*. A rare plant in the past, the Loranthus is now -with settlement expansion and the population of birds that comes with it (as pollinators and distributors) – much more widespread throughout the desert region infecting more and more trees. From the literature survey it was observed that Loranthaceae is a very good medicinal plant [Okoye, 2010] because it is used in complementary and alternative cancer therapy in Europe and it has highly potent in curing circulatory problems, laxative and convulsant [Rani and Naidu, 1995].

In many of the medicinal plants the flowers also has more effect to cure the diseases due to the presence of Phytochemical constituent flavonoid, it has antimicrobial activity due to flavonoid presence in the flowers of Loranthaceae [Jayanthi and Marina, 2013].

*Ocimum basilicum* Linn. Basil, Sweet Basil, Common Basil, Thai Basil, Tropical Basil (Lamiaceae):

*Ocimum album*, *Ocimum anisatum*,  
*Ocimum barrelieri*, *Ocimum medium*,  
*Plectranthus barrelieri*

It is long cultivated, its original habitat is obscure [Bianchini et al., Fruits of the World]. Range of occurrence is Tropical Asia.

*Ocimum basilicum* is a perennial growing to 0.5 m by 0.3 m at a fast rate.

It is frost tender. It is in flower from August to September, and the seeds ripen in September. The species is hermaphrodite and is pollinated by Bees.

Suitable for: light (sandy) and medium (loamy) soils and prefers well-drained soil. Suitable pH: acid, neutral and basic (alkaline) soils. It cannot grow in the shade. It prefers moist soil. Leaves and flowers are consumed raw or cooked [Grieve, 1984; Lust, 1983; Vilmorin, 1981].

Used as a flavouring or as a spinach [Holtom and Hylton, 1979; Usher, 1974], they are used especially with tomato dishes, pasta sauces, beans, peppers and aubergines [Bown, 1995]. The leaves are normally used fresh but can also be dried for winter use [Lust, 1983]. A very pleasant addition to salads [Ken Fern], the leaves have a delightful scent of cloves [Grieve, 1984]. The leaves can be used sparingly in cooking because the heat concentrates the flavour [Phillips and Foy, 1990]. A refreshing tea is made from the leaves [Lust, 1983].

The seed can be eaten on its own or added to bread dough as a flavouring [Facciola, 1990]. When

soaked in water it becomes mucilaginous and can be made into a refreshing beverage called 'sherbet tokhum' in the Mediterranean[Facciola, 1990]. An essential oil obtained from the plant is used as a food flavouring in mustards, sauces, vinegars etc[Schery, Pl for Man; Tanaka, 1976; Facciola, 1990].

An essential oil obtained from the whole plant is used as a food flavouring and in perfumery, dental applications etc[Uphof, 1959;Schery, Pl for Man; Usher, 1974; Tanaka, 1976; Hill, 1952; Bown, 1995]. An average yield of 1.5% essential oil is obtained from the flowering tops[Chief, 1984]. When applied to the skin it makes a good mosquito repellent[Chief, 1984]. The growing or dried plant is an effective insect repellent. It is a good plant to grow in the home, where it repels flies, or in the greenhouse where it can keep all manner of insect pests away from nearby plants[Holtom and Hylton, 1979;Riotte, 1978; Ken Fern]. It has been used in the past as a strewing herb[Allardice, 1993].

Sweet basil has been used for thousands of years as a culinary and medicinal herb. It acts principally on the digestive and nervous systems, easing flatulence, stomach cramps, colic and indigestion[Chevallier, 1996].

The leaves and flowering tops are antispasmodic, aromatic, carminative, digestive, galactagogue, stomachic and tonic[Chief, 1984;Holtom and Hylton, 1979; Lust, 1983; Stuart, 1979; Duke and Ayensu, 1985]. They are taken internally in the treatment of feverish illnesses (especially colds and influenza), poor digestion, nausea, abdominal cramps, gastro-enteritis, migraine, insomnia, depression and exhaustion[Bown, 1995].

Externally, they are used to treat acne, loss of smell, insect stings, snake bites and skin infections [Bown, 1995].

The leaves can be harvested throughout the growing season and are used fresh or dried[Bown, 1995]. The mucilaginous seed is given in infusion in the treatment of gonorrhoea, dysentery and chronic diarrhoea[Chopra et al., 1986]. It is said to remove film and opacity from the eyes[Duke and Ayensu, 1985].

The root is used in the treatment of bowel complaints in children[Chopra et al., 1986].

Extracts from the plant are bactericidal and are also effective against internal parasites[Duke and Ayensu, 1985; Bown, 1995].

The essential oil is used in aromatherapy. Its keyword is 'Clearing'[Westwood, 1993]. In

Chinese medicine for kidney disease and gum ulcers [Karalliedde and Gawarammana, 2008]. In Indian medicine for earache, rheumatoid arthritis, anorexia, itching, menstrual disorders, and malaria [Karalliedde and Gawarammana, 2008].

*Ocimum sanctum* Linn. Holy Basil, Tulsi(Lamiaceae):

Tulsi (*Ocimum sanctum*) is a widely grown, sacred plant of India. Hindus grow Tulsi as a religious plant in their homes, temples and their farms. They use Tulsi leaves in routine worship. Tulsi, grown as a pot plant, is found in almost every traditional Hindu house. The natural habitat of Tulsi varies from sea level to an altitude of 2000 m. It is found growing naturally in moist soil nearly all over the globe. Tulsi is a branched, fragrant and erect herb having hair all over.

It attains a height of about 75 to 90 cm when mature. Its leaves are nearly round and up to 5 cm long with the margin being entire or toothed. These are aromatic because of the presence of a kind of scented oil in them. A variety with green leaves is called Shri Tulsi and one with reddish leaves is called Krishna Tulsi. Tulsi flowers are small having purple to reddish color, present in small compact clusters on cylindrical spikes. Stalkless heart-shaped bracts are there at the base of each flower cluster. Sepal cup is not hairy within. Flowers are rarerly longer than 5 mm, calyx tube bearded outside near base. Flower tube is hairy. The fruits are small and the seeds yellow to reddish in colour.

This herb has been known from as early as the vedic period and is held by Hindus and is often planted around temples and used in roseries. It is native of India, reached western Europe in the 16th centuries. It is being used in several ancient systems of medicine including Ayurveda, Greek, Roman, Siddha and Unani. *Ocimum sanctum* has vast number of therapeutic applications such as in cardiopathy, homeopathy, leukoderma, asthma, bronchitis, catarrhal fever, vomiting, gastropathy, genitourinary disorders, ring worm, verminosis and skin disease etc. It is commonly used in cough cold, mild indigestion, diminished appetite and malaise.

Its extract has numerous pharmacological activities like hypoglycaemic, immunomodulatory, analgesic, anti-stress, anti-pyretic, anti-ulcerogenic, anti-inflammatory, anti-hypertensive and anti-bacterial. The active constituents of herb include volatile oil eugenol and B-caryophyllene, flavonoids and a number of other components present in fixed oil [Bhatt, 2012].



Eugenol (1-hydroxy-2-methoxy-4-allylbenzene), the active constituent present in *Ocimum sanctum* L., has been found to be largely responsible for the therapeutic potentials of Tulsi. Although because of its great therapeutic potentials and wide occurrence in India the practitioners of traditional systems of medicine have been using *Ocimum sanctum* L. for curing various ailments, a rational approach to this traditional medical practice with modern system of medicine is, however, not much available [Prakash and Gupta, 2005]. *Olea europaea* Linn. Olive, African olive, European olive (Oleaceae):

*Olea europaea* is an evergreen Tree growing to 10 m by 8 m at a slow rate. It is in leaf all year, in flower from August to September. The species is hermaphrodite and is pollinated by Wind. The plant is self-fertile. Suitable for: light (sandy), medium (loamy) and heavy (clay) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: acid, neutral and basic (alkaline) soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought. The habitat of the Olive plant is Woods and scrub in dry rocky places [Flora Europaea, 1964]. The range of distribution is S. Europe - Mediterranean.

Olive fruits are widely used, especially in the Mediterranean, as a relish and flavouring for foods. The fruit is usually pickled or cured with water, brine, oil, salt or lye [Hedrick, 1972; Simmons, 1984; Grieve, 1984; Polunin and Huxley, 1987; Facciola, 1990]. They can also be dried in the sun and eaten without curing when they are called 'fichouilles' [Facciola, 1990]. The cured fruits are eaten as a relish, stuffed with pimentos or almonds, or used in breads, soups, salads etc [Facciola, 1990]. 'Olives schiacciate' are olives picked green, crushed, cured in oil and used as a salad [Facciola, 1990]. The fruit contains 20 - 50 µ vitamin D per 100g [Komarov, 1968]. The fruit is up to 4cm long [Huxley, 1992]. The seed is rich in an edible non-drying oil, this is used in salads and cooking and, because of its distinct flavour, is considered a condiment [Grieve, 1984; Uphof, 1959; Schery, Pl for the Man; Polunin and Huxley, 1987; Hill, 1952]. There are various grades of the oil, the finest (known as 'Extra Virgin') is produced by cold pressing the seeds without using heat or chemical solvents [Bown, 1995].

The seed of unpalatable varieties is normally used and this oil has the lowest percentage of acidity and therefore the best flavour [Bown, 1995]. Other grades of the oil come from seeds that are heated (which enables more oil to be expressed but has a deleterious effect on the quality) or from using chemical solvents on seed that has already been

pressed for higher grades of oil. Olive oil is mono-unsaturated and regular consumption is thought to reduce the risk of circulatory diseases [Bown, 1995]. The seed contains albumen, it is the only seed known to do this [Chief, 1981]. Leaves [Hedrick, 1972]. No more details are given. An edible manna is obtained from the tree [Facciola, 1990].

The non-drying oil obtained from the seed is also used for soap making, lighting and as a lubricant [Lust, 1983; Uphof, 1959; Polunin and Huxley, 1987]. The oil is a good hair tonic and dandruff treatment [Lust, 1983]. Maroon and purple dyes are obtained from the whole fresh ripe fruits [Grae, 1974]. Blue and black dyes are obtained from the skins of fresh ripe fruits [Grae, 1974]. A yellow/green dye is obtained from the leaves [Grae, 1974]. Plants are used to stabilize dry dusty hillsides [Huxley, 1992]. Wood - very hard, heavy, beautifully grained, takes a fine polish and is slightly fragrant. It is used in turnery and cabinet making, being much valued by woodworkers [Grieve, 1984; Chief, 1981; Uphof, 1959; Polunin, 1969].

**Ethnomedicinal Potential:** The oil from the pericarp is cholagogue, a nourishing demulcent, emollient and laxative [Grieve, 1984; Lust, 1983; Chopra et al., 1986]. Eating the oil reduces gastric secretions and is therefore of benefit to patients suffering from hyperacidity [Bown, 1995]. The oil is also used internally as a laxative and to treat peptic ulcers [Grieve, 1984; Bown, 1995]. It is used externally to treat pruritis, the effects of stings or burns and as a vehicle for liniments [Grieve, 1984; Lust, 1983]. Used with alcohol it is a good hair tonic and used with oil of rosemary it is a good treatment for dandruff [Grieve, 1984; Lust, 1983]. The oil is also commonly used as a base for liniments and ointments [Lust, 1983]. The leaves are antiseptic, astringent, febrifuge and sedative

[Grieve, 1984; Lust, 1983]. A decoction is used in treating obstinate fevers, they also have a tranquillising effect on nervous tension and hypertension [Grieve, 1984; Bown, 1995]. Experimentally, they have been shown to decrease blood sugar levels by 17 - 23% [Chopra et al., 1986]. Externally, they are applied to abrasions [Bown, 1995]. The bark is astringent, bitter and febrifuge [Grieve, 1984; Chopra et al., 1986]. It is said to be a substitute for quinine in the treatment of malaria [Chopra et al., 1986]. In warm countries the bark exudes a gum-like substance that has been used as a vulnerary [Grieve, 1984]. The plant is used in Bach flower remedies - the keywords for prescribing it are 'Complete exhaustion' and 'Mental fatigue' [Chancellor, 1985].

*Panicum miliaceum* Linn. Proso millet, broomcorn millet, common millet, hog millet, Kashfi millet, red millet, and white millet (Poaceae): *Leptolomamiliacea* (L.) Smyth, *Milium esculentum* Moench nom. illeg., *Milium panicum* Mill. nom. illeg., *Panicum asperrimum* Fisch., *Panicum asperrimum* Fischer ex Jacq., *Panicum densepilosum* Steud., *Panicum milium* Pers. nom. illeg., *Panicum ruderales* (Kitag.) D.M.Chang, *Panicum spontaneum* Zhuk. nom. inval.

Names for proso millet in other languages spoken in the countries where it is cultivated include: Bengali: cheena, Odia: china bacharibagmu, Kannada: baragu, Telugu: variga, Hindi: chena or barri, Punjabi: cheena, Gujarati: cheno, Marathi: vari, Tamil: panivaragu

*Panicum miliaceum* is a grain crop with many common names including proso millet, broomcorn millet, common millet, hog millet, Kashfi millet, red millet and white millet [GRIN, 2015 2]. Archeological evidence suggests that the crop was first domesticated before 10,000 BCE in Northern China [Lu et al., 2009] The crop is extensively cultivated in China, India, Nepal, Russia, Ukraine, Belarus, the Middle East, Turkey, Romania, and the United States, where approximately half a million acres are grown each year [nass.usda] The crop is notable both for its extremely short lifespan, with some varieties producing grain only 60 days after planting [5], and its low water requirements, producing grain more efficiently per unit of moisture than any other grain species tested [Gray bosh and Baltensperger, 2009; Lyman and Shantz, 1913]. The name "proso millet" comes from the pan-Slavic general and generic name for millet (Croatian: proso). Proso millet is a relative of foxtail millet, pearl millet, maize, and sorghum within the grass sub-family Panicoideae. While all of these crops utilize C4 photosynthesis, the others all employ the NADP-ME as their primary carbon shuttle pathway while the primary C4 carbon shuttle in proso millet is the NAD-ME pathway.

Weedy forms of proso millet are found throughout central Asia, covering a widespread area from the Caspian Sea east to Xinjiang and Mongolia. These may represent the wild progenitor of proso millet or represent feral escapes from domesticated production [Zohary and Hof, 2000] Indeed, in the United States weedy proso millet, representing feral escapes from cultivation, are now common, suggesting current proso millet cultivars retain the potential to de-domesticate, similar to the pattern seen for weedy rice [Thurber et al., 2010] Currently, the earliest archeological evidence for domesticated

proso millet comes from the Cishan site in semi-arid North East China around 10,000 BCE [Lu et al., 2009] Because early varieties of proso millet had such a short life cycle -- as little as 45 days from planting to harvest. it is thought that they made it possible for semi-nomadic tribes to first adopt agriculture, forming a bridge between hunter-gatherer focused lifestyles and early agricultural civilizations [smithsonianmag.com] Archeological evidence for cultivation of domesticated proso millet in east Asia and Europe dates to at least 5,000 BCE in Georgia and Germany (near Leipzig, Hadersleben) by Linear Pottery culture (Early LBK, Neolithikum 5500-4900 BCE), [Korber-Grohne, 1987] and may represent either an independent domestication of the same wild ancestor, or the spread of the crop from east Asia along trade routes through the arid steppes [Hunt et al., 2014]. Evidence for cultivation in southern Europe and the Near East is comparatively more recent, with the earliest evidence for its cultivation in the Near East a find in the ruins of Nimrud, Iraq dated to about 700 BC [Johary and Hopf, 2000].

Proso millet is a relatively low-demanding crop and diseases are not known; consequently, proso millet is often used in organic farming systems in Europe. In the United States it is often used as an intercrop. Thus, proso millet can help to avoid a summer fallow, and continuous crop rotation can be achieved. Its superficial root system and its resistance to atrazine residue make proso millet a good intercrop between two water- and pesticide-demanding crops. The stubbles of the last crop, by allowing more heat into the soil, result in a faster and earlier millet growth. While millet occupies the ground, because of its superficial root system, the soil can replenish its water content for the next crop. Later crops, for example, a winter wheat, can in turn benefit from the millet stubble, which act as snow accumulators [P& M proso millet]

Due to its C4 photosynthetic system, proso millet is thermophilic like maize. Therefore, shady locations of the field should be avoided. It is sensitive to cold temperatures lower than 10 to 13 degrees Celsius. Proso millet is highly drought-resistant, which makes it of interest to regions with low water availability and longer periods without rain [Markblatt fur, 2014; Hanna and Baltensperger, 2004]. The soil should be light or medium-heavy. Due to its flat root systems, soil compaction must be avoided. Furthermore, proso millet does not tolerate soil wetness caused by dammed-up water [Hanna and Baltensperger, 2004] Gijang-bap (proso millet rice): Proso millet is one of the few

types of millet not cultivated in Africa [National Research Council, 2008]. In the United States, former Soviet Union, and some South American countries, it is primarily grown for livestock feed. As a grain fodder, it is very deficient in lysine and needs complementation. Proso millet is also a poor fodder due to its low leaf-to-stem ratio and a possible irritant effect due to its hairy stem. Foxtail millet, having a higher leaf-to-stem ratio and less hairy stems, is preferred as fodder, particularly the variety called moha, which is a high-quality fodder.

In order to promote millet cultivation, other potential uses have been considered recently [Rose and Samtra, 2013]. For example, starch derived from millets has been shown to be a good substrate for fermentation and malting with grains having similar starch contents as wheat grains [Rose and Samtra, 2013]. A recently published study suggested that starch derived from proso millet can be converted to ethanol with an only moderately lower efficiency than starch derived from corn [Taylor et al., 2006].

The development of varieties with highly fermentable characteristics could improve ethanol yield to that of highly fermentable corn [Taylor et al., 2006]. Since proso millet is compatible with low-input agriculture, cultivation on marginal soils for biofuel production could represent an important new market, such as for farmers in the High Plains of the US [Taylor et al., 2006]. The demand for more diverse and healthier cereal-based foods is increasing, particularly in affluent countries [Saleh et al., 2012].

This could create new markets for proso millet products in human nutrition. Protein content in proso millet grains is comparable with that of wheat, but the share of essential amino acids (leucine, isoleucine and methionine) is substantially higher in proso millet [Saleh et al., 2012]. In addition, health-promoting phenolic compounds contained in the grains are readily bioaccessible and their high calcium content favor bone strengthening and dental health [Saleh et al., 2012]. Among the most commonly consumed products are ready-to-eat breakfast cereals made purely from millet flour [Markblatt fur, 2014; Saleh et al., 2012], as well as a variety of noodles and bakery products, which are, however, often produced from mixtures with wheat flour to improve their sensory quality [Saleh et al., 2012].

*Phoenix dactylifera* Linn. khajur, khaji, date palm (Arecaceae); *Palma dactylifera* (L.) Mill., *Phoenix chevalieri* D.Rivera, S.Ríos & Obón, *Phoenix iberica* D.Rivera, S.Ríos & Obón

The common names are wild date palm, date, sugar palm, date palm, ittappuzham, khaji, salma, khajur, sendhi, khorjjuri

*Phoenix dactylifera* grows to a height of over 30 m; the stem and new leaves grow from the single terminal bud at the stem apex; roots grow from the base of the trunk, sometimes 50 cm above the ground; main roots about 1.5 cm thick.

Leaves enormous, up to 7 m long with a relatively short (50 cm) rachis base or petiole; pinnate, the 50-60 pairs of leaflets long and narrow, attached to a stout central midrib or rachis. They have a normal life of 3-7 years.

Inflorescence is produced in the axil of a 1-year-old leaf; a branched spadix enclosed in a tough spathe that bursts open when the flowers are mature. Male flowers waxy and creamy with 6 stamens and no carpels; female flowers whitish, with 6 rudimentary stamens and 3 carpels.

Fruits are yellow to reddish-brown, each with a single seed up to 2.5 cm. long, deeply grooved, with a very hard endosperm. There are hundreds of date cultivars, of which only about 60 are widely grown throughout the 15 major date-growing countries.

'Phoenix' is a very old name, used by Theophrastus, indicating that the tree was first introduced to the Greeks by the Phoenicians. The specific name derives from the elongated shape of the fruits, resembling the fingers of the hand, from the Greek word 'dactylos' (finger), and the Latin word 'fero' (I bear).

Morocco, Palestine are the native countries whereas Algeria, Egypt, Eritrea, Ethiopia, Greece, India, Iran, Iraq, Israel, Jordan, Kenya, Lebanon, Libyan Arab Jamahiriya, Namibia, Pakistan, Saudi Arabia, Somalia, Spain, Sudan, Tunisia, Turkey, United States of America, Zanzibar are among the exotic countries of documented species distribution.

The tree of dates or the palm date (*Phoenix dactylifera* L., Family Arecaceae) has played an important role as a food security crop in the Middle East and North Africa region (MENA), providing valuable food for people for the last 5000 years. In appreciation of its fruits, the date tree is referred to as the sacred tree [Porter, 1993], the tree of life [Nixon, 1951], and the bread of the desert [Simon, 1978]. The Latin name of the tree is believed to have been derived from Greek *Phoenix daktulos*, which means purple or red finger.

Date fruits have enormous scope and potential for use as food because of their nutritional and economical value [Khan and Khan, 2016]. Date

fruits contain 6.5–11.5% total dietary fibres (of which 84–94% insoluble and 6–16% soluble dietary fibre), about 1% fat, 2% proteins, and 2% ash and is a rich source of phenolic antioxidants (1–2%) [Yun et al., 2006]. Variations in the chemical composition of date fruits is expected to influence their nutritional value, sensory quality, and industrial utilization. Date seeds, representing 10–15% of the whole fruit [Al-Showian, 1990], [Mossaet al., 1986], is a valuable by-product of date fruit processing industries and is characterized by a high level of water-insoluble mannan fibres and may be used to enhance the fibre content of certain food products.

**Food:** The most important use of *P. dactylifera* is for its fruit, which forms the staple diet of many people in Africa and the Middle East and is as well a cash crop for export. The seeds are roasted and kernels ground as a coffee substitute.

Terminal bud leaves are eaten as a vegetable. The sap can be boiled into unrefined sugar.

The fruit is often dried and then eaten raw or used to add sweetness to a variety of foods such as cakes, fruit pies, confectionary etc [Facciola, 1998; Ken Fern]. The fruit is about 5cm long, 2.5cm in diameter, produced in clusters that can be as large as 1,500 fruits [Martin et al., 1987].

Male inflorescence - eaten as a delicacy [Facciola, 1998].

Pollen is eaten [Facciola, 1998].

**Fodder:** The seeds (stones) when ground and softened by soaking in water are used for feeding camels, goats and horses and have successfully been substituted as a poultry feed.

**Fuel:** The wood can be used as fuelwood.

**Fibre:** The leaves are used in mats, ropes, fans and baskets; the petiole yields a fibre, which together with other suitable material is used for insulating boards.

**Timber:** The trunks are strong and resistant to termites, providing much valued construction timber.

**Alcohol:** Wherever fruiting is poor, the sap is the main product. It can be drunk fresh, fermented and drunk as toddy, or distilled and drunk as arrack. The yield of sap varies with management and site conditions, but it is in the range of 4-8 l/day.

The plant has several services viz., Erosion control: The leaves are applied in sand dune stabilization.

**Shade or shelter:** Old leaves of *P. dactylifera* are used for thatching.

**Reclamation:** Being a halophytic species, *P. dactylifera* has been used for decades for the revegetation of salt affected lands in the Mediterranean region.

**Boundary or barrier or support:** Dried leaves with their stiff, woody rachis are used for fencing.

**Soil improver:** Prunings of leaves are used as manure.

**Ornamental:** The genus *Phoenix* is one of the most widely cultivated groups of palms, its species being extensively used for bold landscape planting, as individual specimens, for avenue planting, and to a lesser extent, as potted plants.

**Intercropping:** *P. dactylifera* while young occupies a lot of space, so a decision to introduce it into cultivated fields must be taken carefully. But once mature, its wide crown grows high above the field crops, and it little affects the yield of cultivated crops. In many places, numerous palms are found in arable fields of suitable regions.

Dates are a demulcent, an expectorant and a laxative, and are used to treat respiratory diseases and fever. The tree yields a gum used in treating diarrhoea [Orwaet al., 2014].

*Phoenix sylvestris* (L.) Roxb. Khajur (Arecaceae):

#### ***Elate Sylvestris* Linn. *Elate versicolor* Salisb**

It is commonly known as wild date palm, date-sugar palm, Indian wild date, Indian wine palm, silver date palm, sugar date palm, sugar palm, khajur, sendhikharjura, khejura, khorjurri, khajjur, khajur, khaajuri, khajuri, kharjurh, kharjuri, kandela, taadii

Wild Date Palm is the wild cousin of the better-known Date Palm. It looks the same in almost every way, but shorter height at maturity. It varies from 4 to 8 m in height and 40 cm in diameter. The leaves are 3 m long, gently recurved, on 1 m petioles with spines near the base.

The leaf crown grows to 10 m wide and 7.5-10 m tall containing up to 100 leaves. The inflorescence grows to 1 metre with white, unisexual flowers forming to a large, pendent infructescence. The single-seeded fruit ripens to a purple-red colour, and is eaten in India. Trunk rough with scars of fallen leaves, Compound leaf with many pointed leaflets, lower pairs reduced to thorns.

The range of its occurrence is E. Asia - Himalayas from western India to Nepal and Myanmar. The habitat of the plant is open forest and grassland [pacsoa]. Commonly found on low ground in the sub-Himalayan tract, along river banks and on stretches of low ground. It can be found in open tropical rainforest, open forest and grassland [ecocrop].

*Phoenix sylvestris* is commonly known as Indian date and is native to India and southern portions of Pakistan. It is traditionally important and known for its nutritional values throughout the world. It is a rich source of carbohydrate, phenols, amino acids, flavonoids, tannins, alkaloids, terpenoids, dietary fibres, essential vitamins and minerals. Different parts of the plant exhibit diverse medicinal properties such as being antipyretic, cardiotoxic, laxative, diuretic and antioxidant.

*Phoenix sylvestris*, one traditional plant, is widely known as Wild date palm. The synonyms of *P. sylvestris* are Date-sugar palm, Indian wild date, Indian wine palm, Silver date palm, Sugar date palm, and Sugar palm. The word Phoenix means purple, while 'sylvestris' means wild. This palm produces edible fruits but it is generally called Wild date palm to distinguish it from the closely related *Phoenix dactylifera*, which is known as Date palm and is cultivated agriculturally as the commercial source of edible dates.

Fruits are consumed fresh or dried.

Fodder is browsing resistant.

Plant is a poor fuelwood.

Plant has several services viz., as a wind break, live fence, and a good nectar source.

System of medicines is used in Ayurveda, Folk medicine, Sowa-Rigpa, Siddha.

Leaf, root, fruit and seeds are used in medicinal purposes.

In Indonesia and India, sugars derived from *P. sylvestris* [Murphy and Briscoe, 1999] are considered more nutritious than cane sugar [Rangaswami, 1977; Morton, 1988]. Fresh sap of *P. sylvestris* is highly rich in vitamin C [Barhet al., 2005]. *P. dactylifera* fruits are useful in the treatment of sore throats, fever, colds, intestinal troubles, bronchial catarrh, gonorrhoea, edema, cystitis and liver and abdominal issues (Morton, 1987). The sap is used as micronutrients and acts as a source of iron and vitamins that improve the vitamin B12 level in anemic patients (Barh and Mazumdar, 2008).

The fruit serves as a tonic and restorative, and is also used as an analgesic to mitigate pain from backache and in the buttocks. In addition, it is widely used as an aphrodisiac, sweetener and diuretic and in the treatment of vomiting, vertigo and unconsciousness.

Dates contain a good amount of dietary fibre and facilitate evacuation of the bowels. Dried dates improve cardiovascular health by soaking out all the cholesterol from the arteries. They have

high calcium content and improve bone health. Generally, the juice of *P. sylvestris* is consumed as a cooling beverage (Sravaniet al., 2010).

The leaf is useful in eye inflammation (Kambleet al., 2011) and the central tender part of the plant cures gonorrhoea and gleet.

Roots of *P. sylvestris* are useful in toothache and are recommended for nervous debility. The gum of the plant is also found to be beneficial in genital-urinary disorders and diarrhoea.

The plethora of literature reviews describe the use of different plant parts such as roots, leaves, fruits, juices and saps utilized by different tribal communities and local peoples of different regions of India, Pakistan and Bangladesh for the treatment of various ailments. Ethnopharmacological uses of *P. sylvestris* plant parts are described as Heart wood is used for improvement of increasing lactation; Fruits for toothache and gonorrhoea, asthma, cough, dehydration, diarrhoea, fever, heart-related problems, pains, toothache, tuberculosis, as laxative, strengthen body, cardio tonic, aphrodisiac seminal weakness, general debility, headache, piles, fever arthritis, tonic, cold flu, good source of vitamins B and C, diuretic, diabetes, demulcent, male fertility, body strength; root in toothache, dysentery; seed (decoction) dysentery; fruit juice in constipation, general weakness, gonorrhoea, cough, fever etc.

*Pistacia vera* Linn. Pistachio, Pistachio Nut (*Pistaciaceae*):

*Pistacia vera* is a deciduous tree growing to 10 m at a medium rate.

The species is dioecious (individual flowers are either male or female, but only one sex is to be found on any one plant so both male and female plants must be grown if seed is required). The plant is not self-fertile.

Suitable for: light (sandy) and medium (loamy) soils, prefers well-drained soil and can grow in nutritionally poor soil. Suitable pH: acid, neutral and basic (alkaline) soils and can grow in very alkaline soils. It cannot grow in the shade. It prefers dry or moist soil and can tolerate drought.

*Pistacia vera* is found on hilly and mountainous regions, especially on sandstone soils, with a temperature range from -10°C in the winter to 40°C in the summer, to 1500 metres [Huxley, 1992]. Woodland Garden Sunny Edge. The range of its occurrence is West Asia.

Seeds are consumed raw or cooked [Hedrick, 1972; Uphof, 1959; Usher, 1974; Komarov, 1968].

The seed is rich in oil and has a pleasant mild flavour [Hedrick, 1972]. It is very nice when eaten raw and is also widely used in confectionery, ice cream, cakes, pies etc [Facciola, 1990].

An edible oil is obtained from the seed but is not produced commercially due to the high price of the seed [Facciola, 1990]. The fruits can be made into a flavourful marmalade [Facciola, 1990].

The seed yields up to 40% of a non-drying oil. It is not used commercially due to the high value of the seed for food [Facciola, 1990]. Male trees yield a small quantity of a high-grade resin. It is used in paints, lacquers etc [Komarov, 1968].

The plant is used in China for the treatment of abdominal ailments, abscesses, amenorrhoea, bruises, chest ailments, circulation, dysentery, gynecopathy, pruritus, rheumatism, sclerosis of the liver, sores and trauma [Duke and Ayensu, 1985]. The seed is said to be sedative and tonic [Chopra et al., 1986].

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