1. **Aconitum heterophyllum** Wall. ex Royle

**Family** : RANUNCULACEAE

**Synonyms** :
- *Aconitum atees* Royle (nomen tautum)
- *Aconitum cordatum* Royle
- *Aconitum ovatum* Lindl.

**Botanical description** : A tall perennial herb.

**Distribution** : Occurs in North West Himalayas, cultivated at Manali & Rahla in Himachal Pradesh

**Vernacular Names**

E - Atis Root, Indian atees; H - Atis Atelcha, Ativish Ativ akh; S - Ativisha, Sitashringi, Pankura Bhangura or Upavishaka; K - Athivisha Atis Atvika; Tam - Ati vadayam, Atividadam; Tel - Ativasu, Atirasa, Ativasa

**Parts used** : Roots (dried tuberous)

**Medicinal Uses**

a) Ayurveda : Root : antiperiodic, aphrodisiac, astringent; tonic; in diarrhoea, dyspepsia, cough, valuable febrifuge, bitter tonic used for hysteria, throat infections, vomiting, abdominal pain and diabetes. Valuable for combating debility and after fevers. Efficacious in dysentery and acute inflammatory affections. Plain powder of the tuberous root mixed with honey is given in cough, coryza, fever and vomiting in children. It is applied to the tongue, dose being strictly according to age. Causes constipation when taken in large doses.

The root is prescribed with other drugs for the treatment of snake bite (Charaka, Sushruta, Vagbhat) and scorpion sting (Sushruta).

b) Unani : Aphrodisiac, stomachic, astringent, balgham, piles, dropsy, vomiting, safra.

White and dark varieties of roots used as tonic, strengthens the body, alleviates dysentery, good in piles, in bilious complaints, in plethoric conditions, removes gases from the stomach.
Chemistry: Non-toxic amorphous alkaloids isolated from the roots which include atisine 0.4%, dihydroatisine, heteratisine, hetisine, histisine, heterophyllisine, heterophylline, heterophyllidine, atidine, hetidine, benzolheteratisine, F-dihydroatisine and hetisinone.

Total alkaloid content 0.79%. Alkaloid atisine physiologically a relatively inactive substance. The other constituents are aconitic acid, tannic acid, pectuous substance, abundant starch, fat, a mixture of oleic, palmitic, stearic glycerides, vegetable mucilage, cane-sugar and ash 2%.

2. Adhatoda vasica (L.) Nees

Family : ACANTHACEAE
Synonyms : Adhatoda zeylanica Medic., Justicia adhatoda L.

Botanical description : A dense shrub with long ascending branches, stem with yellowish bark.

Distribution : Hedge plant in Gujarat & Karnataka. Grows in wild especially in North Kanara, Coorg, Hassan, Dharwar & Belgaum.

Vernacular Names

E - Malabar nut; H - Basak, Arusa, Adulasa, Arusha, Rus; S - Vasaka, Sinhaparni, Vasa, Vasika; K - Adusoge, Adsale, Adumuttada, Atarusha; Mal - Atalotakam; Tam - Adatodai, Adadodai, Kattumurungai; Tel - Addasaram, Adasaramu, Adampaka, Adamkabu.

Parts used : Roots, wood, leaves, flowers, and seeds.

Medicinal uses

a) Ayurveda : A yellow dye is obtained from the leaves. The leaves and the root are considered an efficacious remedy in all sorts of coughs and colds.

Dried leaves are used in bronchial troubles and consumption. Leaf juice is also used in diarrhoea,
dysentery and glandular tumours. Powdered leaves are used for skin affections. It is used as a promising uterotonic. Dried leaves are also used in stopping post-partum haemorrhage. Leaves are also used for rheumatism. Flowers, leaves and roots are antispasmodic. Leaves also possess anthelmintic property. Roots, leaves and flowers yield an oil which is effective against tubercle bacilli.

Expectorant, diuretic, and alterative. Decoction of leaves and roots an excellent cough mixture. It is also good for scabies. Dried leaves are smoked as cigarettes with much benefit in asthma. Fresh flowers are bound over the eyes in ophthalmia. Sweetened decoction of the plant cures bleeding of lungs.

The plant is pungent, bitter, acrid, cooling, causes "Vata", useful in bronchitis, leprosy, blood impurities, heart troubles, thirst, asthma, fever, vomiting, loss of memory, leucoderma, consumption, jaundice, diseases of the mouth and tumours. The root facilitates the expulsion of the foetus; useful in strangury and in leucorrhoea with blood discharges. The plant is recommended as a snake bite remedy (Charaka).

b) Homeopathy: Highly efficacious medicine for acute catarrhal conditions of the respiratory tract.

c) Unani: The plant is diuretic, useful in bronchitis, bilious vomiting, sore eyes, fevers, gonorrhoea and as an emmenagogue. The flowers improve circulation of blood. Cough, asthma, loosens phlegm for easy expectoration.

Chemistry: Leaves - alkaloid vasicine and small amount of essential oil. Therapeutic properties are attributed to vasicine and the essential oil. Vasicine contains 1-peganine (1-vasicine); same as synthetic 1-peganine. Fresh or dried leaves constitute the drug vasaka, used in bronchial troubles and consumption. Chief principle in powdered leaves is vasicine (yield, 0.54-1.1%) vasicine found to be a promising abortifacient. Leaves rich in Vit. C (upto 250 mg/100g) and carotene (4500µg/100g) and yields an essential oil.

Seeds yields fatty oil. The constituents are an odorous essential oil, fat, resin, the bitter non-volatile alkaloid vasicine, an organic acid "adhatodac acid", sugar, gum, colouring matter and salts, occurs in the root bark. The alkaloid vasicine and its salts are not very toxic to undifferentiated protoplasm. They have no toxic or inhibitory effect on the cultures and growth of Streptococci, Staphylococci, Bacillus coli, Bacillus diphtheriae or Bacillus tuberculosis.
3. **Aegle marmelos** (L.) Correa

**Family**: RUTACEAE

**Botanical description**: A small tree armed with strong straight, sharp spines.

**Distribution**: Occurs throughout Karnataka particularly Bidar, North Kanara, Hassan and Bangalore. In South India & Central Deccan in dry forests and occasionally in dry deciduous plains.

**Vernacular Names**

E - Bael tree or Bengal quince, stone apple, golden apple;  
H - Bel, Bilva; S - Bilva, Shripala; K - Bilpatre; Mal - Vilvam, Kovalam; Tam - Villuvam, Vilva; Tel - Maredu, Bilvamu, Sripalamu.

**Parts used**: Root bark, wood pulp, stem, leaves, flowers, dried unripe fruits, pulp of ripe fruits and dried fruits.

**Medicinal Uses**

a) **Ayurveda**: Dried unripe fruit has long been used as a remedy for diarrhoea and dysentery. Fruits constitute the drug called Bel, which is chiefly used in chronic diarrhoea and dysentery. Sherbets prepared from the pulp of fruits are soothing agents for intestines of patients suffering from bacillary dysentery. Half ripe fruit is used as an astringent, digestive, stomachic and in diarrhoea. Pulp of the ripe fruit is aromatic, cooling and a mild laxative.

Root bark is used in intermittent fevers and as a fish poison. Bael fruit is eaten during convalescence after diarrhoea. Bael marmalade is used to prevent cholera epidemics. It is also given to prevent the growth of piles. Decoction of root, root bark and sometimes stem bark is useful in intermittent fevers; also in hypochondriasis and melancholia. Leaves are made into a poultice and applied to inflamed parts.

The unripe fruit removes "vata" and "kapha" and is good for the heart.

The root, leaves and bark are prescribed as an antidote to snake venom (Sushruta). In Cambodia the fruit is prescribed in tuberculosis and hepatitis.
Ripe fruit is sweet, aromatic, cooling, alterative and nutritive. When taken fresh it possesses laxative properties. Unripe fruit is astringent, digestive and stomachic, and a little constipative. Pulp is stimulant, antipyretic and antiscorbutic. Fresh juice is bitter and pungent.

b) Homeopathy : It is known for its therapeutic value for bleeding piles; diarrhoea and dysentery, fever with dropsy and impotency.

c) Unani : Used as a tonic for the brain, heart and stomach, astringent, haemostatic in dysentery and as an aphrodisiac. Bad for the liver and the chest.

Chemistry : Marmelosin is the active principle in the fruit pulp which acts as a laxative and diuretic. In strong doses it acts as a cardiac depressant.

Fruit contains marmelosin which is identical with imperatorin; young bark contains - coumarin (0.03%), alkaloid (0.003%) and umbelliferone; old bark contains - umbelliferone and coumarin (0.6%). Mature bark of Bihar variety gave (0.3%) alkaloid. The alkaloid aegelenine is identical with fagarine isolated from Zanthoxylum coca Gill. Leaves contain essential oil comprising 2- and B-phellandrene. Matured bark has - R - fragrine 0.3%, umbelliferone (0.6%) and marmesin (0.6%).


Uses as food : The sweet aromatic pulp of fruit is edible.

4. Aglaia elaegnoides (Juss.) Benth.

Family : MELIACEAE

Synonyms : Aglaia roxburghiana Miq. (B.P.);
            Milnea roxburghiana (Miq.) Wt. & Arn.

Botanical description : Large tree upto 15m with bright red heart wood and light brown bark.

Vernacular Names

H - Priyangu; S - Priyangu, Lata, Kanta, Gauri; Mal - Punyava, Sempuli; Tam - Chokkala; Tel - Yerra aduga.

Parts used : Root, bark, fruits and seeds.

Medicinal Uses

Ayurveda : Fruit cooling, astringent, and used in inflammation and leprosy and febrile complaints. Seeds used in painful micturition.

Bark is emetic, relieves "kapha" and "pitta". Root is abortifacient. Root and bark are acrid, bitter, refrigerant, aphrodisiac, alexeteric, removes "vata" and biliousness, cures dysentery, leucoderma, skin diseases, leprosy, removes bad odours, excessive perspiration, burning fever, thirst, vomiting and blood impurities. Leaves are emetic and controls abdominal pain. Flowers are useful in leprosy. Seeds are astringent to the bowels and remove biliousness and "kapha".

Chemistry : The chemical nature of this plant has not been worked, however the seeds of Aglaia diepenhorstii yielded essential oil containing aromadendrene, cineol, L-terpinene and citral.

Uses as food : Fruits are edible.

5. Aleurites moluccana (L.) Willd.

Family : EUPHORBIACEAE

Botanical description : An evergreen, widespread, shade tree, often stellately pubescent.

Distribution : Introduced from Malaya, naturalised in Wynad, Assam and South India.
Vernacular Names

E - Belgaum walnut, Candle nut tree Varnish Tree, Filberts; H - Jangli akhrot; S - Akshota; K - Natakrodi; Mal - Akrottu, Akshotam, Karankolam; Tam - Nattakkarotttu, Woodooga; Tel - Natakrotu.

Parts used : Fruits and seeds.

Medicinal Uses

a) Ayurveda : Fruit is sweetish, sour, oleagenous, cooling, aphrodisiac, tonic, improves appetite, useful in "vata" diseases of the heart and the blood, burning sensations, increases "kapha" and biliousness and in constipation.

Oil from the seeds is used as purgative and substitute for castor oil. Seeds laxative. Seeds yield fixed oil; rind of fruit yields an essential oil.

b) Unani: Fruit has a pleasant taste, tonic, aphrodisiac, carminative, expectorant, good for the heart, liver and brain, useful in bronchitis, piles, watery eyes, hydrophobia, bruises, ringworm. The oil is aphrodisiac, cardiotonic and good for pains in the body.

Oil obtained from the kernels act as a mild and sure purgative. Superior to castor oil in having neither smell nor taste and as producing its cathartic action without nausea.

Chemistry : Kernel contains cellulose, fat, organic and mineral matter; ash contains lime, magnesia, phosphoric anhydride. Seeds yield a fixed oil which contains oleine, myristin, palmitin, stearin and an acrid resin in which resides the purgative principle.

6. **Alhagi pusealhagi** (Bieb.) Desv.

Family : FABACEAE (LEGUMINOSAE; PAPILIONACEAE)

Synonyms : Alhagi maruorum Bak.,
Alhagi camelorum Fisch.

Botanical description : A spreading shrub armed with axillary spines.

Distribution : Gujarat, Punjab, Uttar Pradesh, Egypt, Arabia.
Vernacular Names

E - Camel-thorn, Persian manna plant; H - Jawasa, Bharbharra; S - Durlabha; K - Billidurva, durlava; Tel - Tella-giniya, Girikarmika, Tellaginiya chettu.

Parts used: Roots, twigs and leaves.

Medicinal Uses

Ayurveda: Plant is used as laxative, diuretic and expectorant; Oil from the leaves is used for curing rheumatism. The plant possesses antibilious and antiseptic properties. Decoction of twigs is used in cough. Decoction of roots used for swellings and abscesses. A sweet sugary excretion, Alhagi manna, obtained from the plant is called Taranjabin and is used as an expectorant, antiemetic and laxative. Infusion is used as a diaphoretic. Flowers are used for piles.

Chemistry: Twigs contain alkaloids which showed sympathomimetic activity.

7. Alstonia scholaris (L.) R. Br.

Family: APOCYNACEAE

Synonym: Echites scholaris L.

Botanical description: A tall, large, evergreen tree with bitter, milky juice.

Distribution: Deccan deciduous forests and in Western Ghats. Found wild at Savandurga forest and Bannerghatta. An avenue tree in and around Bangalore. Occurs in Kanara, Coorg and Shimoga. Cultivated in Ceylon, tropical Africa and Eastern Australia.

Vernacular Names

E - Devil's tree, Dita Bark Tree; H - Chatium, Satwin, Chatian, Satium; S - Sapta parna; K - Maddale; Mal- Pala; Tam- Pala, Mukampalei; Tel - Edakulapala, Aeda-kularitechettu; palgaruda, Eda-kula; Trade- Chatiyan or Shaitan Wood.
Parts used: Bark, milky juice, wood, leaves, flowers, wood charcoal, and ash of the plant.

Medicinal Uses

a) Ayurveda: Milky juice - applied to ulcers, tumors, earache and rheumatic pains. Bark is a bitter tonic, alterative, febrifuge in malaria, useful in chronic diarrhoea and dysentery and in snake bite, astringent, anthelmintic and galactogogue. Used in the form of liquid extract or tincture for chronic diarrhoea, asthma and cardiac troubles; also used as an haemostatic.

Leaves are used in beri-beri, dropsy, and congested liver.

Stimulant, carminative, astringent, aphrodisiac, expectorant, tonic and as a gastro intestinal sedative.

The use of 'dita bark' extract in place of quinine for malaria and for amoebic dysentery is of doubtful value because the amoebae continue to be motile in an echitamine solution (Chopra et al., 1956).

b) Homeopathy: A tonic after exhausting fevers. Locally, for ulcers and rheumatic pains.

Chemistry: Flowers yield an essential oil and the alkaloid picriline which acts as a depressant on the central nervous system in rats and mice. Ash of the plant employed as caustic to open abscesses.

Picriline alkaloid was said to potentiate hexobarbitone hypnosis and morphine analgesia.

Alkaloids present in the bark are echitamine, ditamine, echitamidine, Echitamine being the chief constituent. Total alkaloid content of Indian bark 0.16-0.27%; 0.5% echitamine in Mysore bark. From the Indian source, a number of indole alkaloids have been reported, the major one being picriline, which was found to possess a CNS depressant action in rats and mice (Dutta, et al., 1976).

The bark contains dita ascribed to have febrifuge properties.

Family : ZINGIBERACEAE

Botanical description : Rhizomatous herbs with leafy stem; leaves glabrous; spike very dense, shortly peduncled.

Distribution : Grown in swampy places in Bengal, Sikkim, Assam and Tamil Nadu. Also along the mountain streams in Nepal.

Vernacular Names

E - Greater cardamom, Indian or Nepal Cardamom; H - Bara elaichi, Murrung elaichi, Baraelachi; S - Brihadaela, Brihatupakunchika; K - Doddayalakki; Mal - Perielav, Periya elattari; Tam - Periyayelam; Tel - Peddayelaki.

Part used : Fruits, seeds and seed oil.

Medicinal Uses

Ayurveda : Seeds are used as fragrant adjuncts to other stimulants, bitters and purgatives.

Seed oil is aromatic, and used as a stimulant, stomachic and applied to eyelids to allay inflammation. Seeds are also useful in neuralgia in gonorrhoea, as aphrodisiac, as an antidote to scorpion-sting and snake bite. Seeds are stomachic, carminative and stimulant; decoction of cardamoms used as a gargle in affections of the teeth and gums. Promotes elimination of the bile and is useful in congestion of liver.

Chemistry : An essential oil extracted from the seeds of *Amomum subulatum* is rich in cineole.

Uses as food : Essential oil of seeds possess properties more or less similar to those of the true cardamoms (*Elettaria cardamomum*) for which they are often substituted. They are used in sweetmeats. Seeds are used for flavouring beverages. Fruits and seeds are used for imparting flavour and taste to cooked food.

Both in the indigenous and western medicines, cardamom is used as a frequent adjunct to other stimulants, bitters and purgatives in the form of tincture or powder.
9. **Anethum graveolens** L.
   *(including *Anethum sowa* Roxb., non Kurz.)*

<table>
<thead>
<tr>
<th><strong>Family</strong></th>
<th><strong>APIACEAE (UMBELLIFERAE)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Synonym</strong></td>
<td><strong>Peucedanum graveolens</strong> (L.) Hiern</td>
</tr>
<tr>
<td><strong>Botanical description</strong></td>
<td>Herbs with sheathing petioles, umbellate inflorescence, pentamersous perianth and androecium, bicarpellary, bilocular inferior ovary. The fruit is a schizocarp.</td>
</tr>
<tr>
<td><strong>Distribution</strong></td>
<td>Cultivated all over India.</td>
</tr>
</tbody>
</table>

**Vernacular Names**

E - Indian dill, Dill, dill seed; H - Sowa, Soya; S - Satapushpi, Misroya; K - Sabbasige; Mal - Chatukuppa; Tam - Sata kuppi, shatakupivirai; Tel - Shatakupivittulu.

**Parts used**

Herb, fruits, dried ripe fruits and seeds.

**Medicinal Uses**

**Ayurveda**

Leaves are used for flavouring and fruits are used as carminative, stomachic and stimulant. Dried ripe fruits constitute drug, used as carminative and stomachic. Essential oil from the seeds used as carminative, useful in flatulence of children. In disordered digestion, dill water is an excellent remedy. Freshly cut herb, on steam distillation, yields oil of dill herb whereas mature, crushed seeds yield oil of dill seed. Oil is used as flavouring agent in food industries besides its use in pharmaceutical and perfumery industry.

Used as diuretic, resolvent, emmenagogue and galactogogue. Dill water prepared from the fruit (seed) is regarded to promote the secretion of milk.

Among Indian drugs, dill seeds hold a prominent place as a stomachic, especially in the ailments of children and women. Leaves are applied to boils and abscesses to hasten suppuration. Leaves are cooked as a pot herb, along with other vegetables.

**Chemistry**

Seeds yield 3-3.5% essential oil, Root yields essential oil containing 95% $\Delta$-B-pinene; herb yields 0.062%
essential oil with high proportion of terpenes (α-phellandrene) but no carvone. Dried ripe dill fruit contains a volatile oil 3 to 4% and fixed oil. The volatile essential oil is composed of anethine, phellandrene and d-limonene and apiol (which is rather peculiar in its properties) termed 'dill apiol' (Ciamician & Silber, 1896) also carvol (carvone) and another hydrocarbon.

10. Angelica glauca Edgew.

Family : APIACEAE (UMBELLIFERAE)
Botanical description : A glabrous herb, stem erect, hollow, finely grooved.
Distribution : Found in Kashmir and Himachal Pradesh
Vernacular Names : E - Angelica; H - Chora
Parts Used : Dry roots, herb and fruits.
Medicinal Uses
Ayurveda : Roots yield an essential oil. Herb is used in medicines as stimulant in dyspepsia and constipation. Herb is cordial.

Chemistry : Dry roots yield 1-3% essential oil main constituents being β-phellandrene, dα-phellandrene, α-pinene, hydroxy pentadecanoic acid and α-methyl butyric acid. Roots and fruits contain several furo-coumarins as angelicin, bergapten, xanthotoxin, etc., in addition to umbelliprenin and some phenols.

Uses as food : Roots are used as spice and condiment.

11. Apium graveolens L.

Family : APIACEAE (UMBELLIFERAE)
Botanical description : Biennial, stems erect, branching.
Distribution : Cultivated in Uttar Pradesh, Himachal Pradesh and South India.
Vernacular Names

E - Celeriac, Garden Celery; H - Ajmud, Karas, Salari; S - Ajmoda, Vishali, Mayura; K - Ajmod.

Parts Used: Roots, long leaf stalks, dried ripe fruits and seeds.

Medicinal Uses

a) Ayurveda: Seeds are used as stimulant, carminative, nerve sedative and tonic. The root is used as an alterative, diuretic, given in anasarca and colic. Seeds as cordial, diuretic, emmenagogue, as antiseptic, used in bronchitis, asthma and for liver and spleen diseases.

Essential oil, glucoside apiin contracts gravid and virginal uterus.

Fruits are used for extracting an oil, which is antispasmodic, nerve stimulant. Useful in rheumatoid arthritis and gout. Decoction of seeds is a popular household remedy for rheumatism.

The seeds have a pungent, sharp taste, used as an aphrodisiac, tonic, astrin-gent to the bowels to improve appetite, to cure "kapha" and "vata". Good for the heart; useful in ophthalmia, bronchitis, vomiting, hiccough, rectal troubles, ascites, eructations, abdominal pain, toothache and tumours.

b) Homeopathy: Useful in an obstinate retention of urine, throbbing headaches, heartburn and swelling of throat, face and hands, rheumatic pain in muscles of neck, and in dysmenorrhoea, with short, sharp pains.

c) Unani: Used as laxative, carminative, appetiser, anthelmintic, aphrodisiac, aborti facient, ophthalmia, scabies, scorpion and other stings, asthma, vomiting, diseases of the heart and spleen, amenorrhea, urinary discharges, fever with cough, rheumatism, chest pains, inflammations, and catarrh of the nose.

Chemistry: Contains sulphur, apiol which is a poisonous principle, a glucoside apiin, a volatile essential oil, albumen, mucilage and salts. Also contains a soporific active principle. (Boerickes Materia Medica, 1991).

**Family** : APIACEAE (UMBELLIFERAE)

**Synonym** : *Pimpinella involucrata* W. & A.

**Botanical description** : Herb, annual, root fusiform.

**Distribution** : Cultivated throughout India.

**Vernacular Names**

H - Ajmod, Chanu, Randhuni; K - Ajmodavoma; Tam - Ashamtagam, Ashamtavomam; Tel - Ajumodavomam, Ajumodavomaru.

**Parts Used** : Fruits and seeds.

**Medicinal Uses**

a) **Ayurveda** : Carminative, stomachic and stimulant. Seeds are useful in hiccup, vomiting and pain in the bladder.

b) **Unani** : The seeds have a hot, sharp taste laxative, carminative, appetiser, anthelmintic, aphrodisiac, abortifacient, good in ophthalmia, scabies, scorpion and other stings; cures asthma, stops vomiting, cures diseases of the heart and spleen, amenorrhea, urinary discharges, fever with cough, rheumatism, chest pains, inflammations and catarrh of the nose.

**Uses as food** : Cultivated in Indian gardens for the aromatic fruits used as a flavouring ingredient in curries.

**Taxonomic Notes** : Botanical identity doubtful.


**Family** : THYMELAEACEAE

**Botanical description** : An evergreen, large tree, the young shoots pilose.

**Distribution** : Eastern Himalayas, Bhutan and parts of Bengal and Assam.
Vernacular Names

E - Calambac, Eagle-wood; H - Agar; S - Agaru, Agnikashtha, Asara; K - Agaru; Mal - Kayagahru; Tam - Agar, Aggalichandana; Tel - Agru.

Parts Used : Wood.

Medicinal Uses

a) Ayurveda : Wood is used as a stimulant, carminative, tonic, aphrodisiac, astringent in diarrhoea and vomiting and in snake bite.

The wood is pungent, bitter, fragrant, oleagenous, used as an alterative, tonic, carminative, in "kapha" and "vata", diseases of ear and skin, hiccough, leucoderma and eye troubles.

The wood is prescribed in the treatment of snake-bite and scorpion sting (Charaka, Sushruta) but it is not an antidote to either snake venom or scorpion venom.

The fragrant resinous substance is considered cordial. It has been prescribed in gout and rheumatism. It is a delightful perfume, serviceable in vertigo and palsy, and the powder is useful as a restrainer of the fluxes and vomiting. In decoction, it is useful to allay thirst in fever.

b) Unani : Wood is fragrant with a bad taste; laxative, tonic, carminative, stomachic, diuretic, aphrodisiac, useful in chronic diarrhoea, bad taste in the mouth, diseases of the liver and intestines, bronchitis, asthma, vomiting, to strengthen the brain and to stabilise the foetus.

c) Others : In China the wood is used as a tonic, stimulant, carminative, and as an aphrodisiac.

In Cambodia, the wood is used as a febrifuge and is administered in paludism.

Chemistry : Japanese agar wood, "Kanankoh" yielded a new derivative of 2-(2-phenylethyl) chromone (Nakanishi et. al., 1986).
14. **Azadirachta indica** A. Juss.

**Family** : MELIACEAE

**Botanical description** : A fascinating tree, bearing small, white and sweet-scented flowers.

**Distribution** : Dry forests of Deccan and Carnatic; largely planted and runs wild all over India. Native to India and Burma.

**Vernacular Names**

E - The Neem or Margosa tree; H - Nim or Nimb; S - Nimba, Vembaka; K - Bevu, Kahibevu; Mal - Vepa, Veppu; Tam - Vepa, Vembu; Tel - Yapa, Yepa, Vepa.

**Parts Used** : All parts of the plant.

**Medicinal Uses**

a) **Ayurveda** : The root bark and young fruits are used as an alternative, antiperiodic and as a tonic.

Green twigs are used as toothbrushes for cleaning teeth and as a prophylactic for mouth and teeth complaints.

The bark, gum, leaf and seed are used in snake bite and scorpion sting.

The bark is used as a bitter tonic, astringent, antiperiodic, antipyretic and against nausea and vomiting.

Gum is demulcent tonic in catarrhal affections.

Leaves are used as poultice for boils. Decoction of leaves used as an antiseptic in ulcers and eczema.

Dry flowers are stomachic. Seed oil is a stimulant, antiseptic, alternative in rheumatism and skin diseases (Indian Pharmacopoeia).

Berries are purgative, emollient and anthelmintic.

An extract of leaves is used in toothpastes. Neem oil is said to be effective in the treatment of leprosy and skin diseases.
Homeopathy: Used against rheumatic pains. Pain in sternum and ribs, in the extremities and aches in hands and toes. Also against oedema, pemphigus and scabies.

c) Unani: Neem finds use as a resolvent, blood purifier, soundavi diseases. Leaves expel wind, heal ulcers in urinary passages. Used as an emmenagogue and in skin diseases.

Fruit is used as an astringent and in leprosy and bronchitis.

Chemistry: The general class of natural products present in neem are called "triterpenes" or "limonoids". New limonoids are still being discovered in neem. Azadirachtin, salannin, meliantriol and nimbin are known. The bitter constituent, nimbin molecule, contains an acetoxy, a lactone, an ester, a methoxy and an aldehyde group. Nimbidin contains sulphur. The bark exudes a clean bright amber coloured gum which is collected in small tears or fragments. It contains a bitter alkaloid named "margosine". Leaves contain a small quantity of bitter substance of a similar character but much more soluble in water. This substance is a hydrate of the resin. Seeds contain 10% to 31% of a yellow bitter fixed oil with a strong disagreeable acid taste. The volatile fatty acids probably consist of a mixture of stearic and oleic acids with a small amount of lauric acid.

Flowers have been found to contain a flavanoid. Nimbicetin is identical to kaempferol. In the dried bark the same bitter components as in the seed oil have been found and in the pericarp of the fruit a bitter principle bakayanin was found (Narayanan and Iyer, 1967).

Roy & Chatterjee (1921) analysed the oil and found the following constituents -

1) Sulphur 0.427%; (2) A very bitter yellowish substance obtained from the alcoholic extract of the oil, which is supposed to be an alkaloid; (3) Resins; (4) Glucosides and (5) Fatty acids.

Mellacins found in the seeds include gedunin, 7-desacetylgedunin, desace tylnimbin and azedarachtin.

The seed oil mainly contains nimbidin, nimbin and nimbinin, which also occur in the stem bark (Chatterjee et al., 1948).

Trunk bark yields 0.04% nimbin, 0.001 nimbinin, 0.4% nimbidin, and essential oil 0.02%.
Tetracyclic triterpenoids and their derivatives have been isolated from the stem bark (Siddiqui et al., 1988) along with Tricyclic diterpenoids (Ara et al., 1988).

The toddy or sap contains glucose, sucrose, gums and colouring matter.

Nimbin and nimbidin have been found to have antiviral activity. They affect potato virus X, vaccinia virus, and fowl pox virus.

Neem oil suppresses several species of pathogenic bacteria such as Staphylococcus aureus and Salmonella typhosa.

Neem showed no antibacterial activity against Escherichia coli, Enterobacter, Pseudomonas aeruginosa, Citrobacter, Klebsiella pneumoniae, Proteus mirabilis, Proteus morgani, Pseudomonas E01 and Streptococcus faecalis.

The growth of all strains of Mycobacterium tuberculosis and Micrococcus pyogenes var. aureus was inhibited by a concentration of 1:800,000 and the growth of Shigella typhosa, Salmonella paratyphi and Vibrio cholerae inaba was inhibited by a concentration of 2mg/l; Nimbidin from seed oil has shown potent anti-inflammatory activity in experimental animals.

Neem oil (2.5ml), and nimbidin (200mg/kg body weight) lowered the blood sugar level by 24 and 26 percent respectively at the 5th hour of feeding.

Aqueous extracts of seeds and leaves contain sodium nimbinat-e (triterpene) which showed antifertility activity (Sharma and Saksena, 1959; Garg et al., 1970; Farnsworth and Waller, 1982).

Chatterjee and Roy state on clinical evidence, that the Margosates are powerful against protozoa; a solution of 1 in 10,000 kills the flagellate Prowazekia in five minutes.

Other Uses: Neem oil is used for making several pharmaceutical preparations including emulsions, liquors, ointments, medicinal cosmetics, lotions, shampoos, creams, hair tonics, and gargles.

The margosa oil is used for burning and for hydrogenation. Tree is considered a good purifier of air due to its large leaf area. Oil cake, obtained from seeds, is used as a fertiliser and manure. Leaves are used to repel insects and to preserve woollens. Extract of leaves is used in soaps.
During small pox outbreak garlands made of stones are hung on doors in the belief of keeping away infection. Bark yields tannin. Gum exudate from the bark is used for dyeing silk.

15. *Berberis aristata* DC.

**Family** : BERBERIDACEAE

**Botanical description** : Shrubs with alternate leaves.

**Distribution** : Grows on the Nilgiris and all over the temperate Himalayas from Bhutan to Kunawer.

**Vernacular Names**

E - Indian barberry; H - Rasant; S - Pitadaru, Parjanya; K - Doddamara-darsina; Mal - Maramanjal; Tam - Maramanjal; Tel - Kasturipaspu.

**Parts Used** : Root-bark, stem, wood, fruit and extract.

**Medicinal Uses**

a) *Ayurveda* : Tonic, stomachic, astringent, anti-periodic, diaphoretic, antipyretic and alterative; root is purgative; fruit is 'adish'.

Tincture of the root bark is used as a bitter tonic, stomachic, cholagogue, antiperiodic and alterative (Chopra, et al., 1956). Used in intermittent and remittent fevers, in periodic neuralgia, in cases of enlargement of the liver and spleen. Recommended in fevers accompanied by bilious symptoms and diarrhoea. Extract from the root-bark is locally applied in affections of the eyelids and in chronic ophthalmia. A decoction with honey is given in jaundice and as a wash for ulcers.

b) *Siddha* : Used in the diseases of the eye, ears and face. Also in diabetes and skin diseases.

c) *Unani* : Moderately hot and moist. Used in enlarged spleen, jaundice, as an emmenagogue, 'Usara' in mucous dysentery and colitis.
Chemistry: Root and wood are rich in a yellow alkaloid "berberine", a bitter substance. Root contains two alkaloids. 

The bark extract was found to be effective in vitro against E. coli, Salmonella, Shigella, Vibrio cholerae and Yersinia enterocolitica. Commerically available berberine, an alkaloid proved to be antitoxic in vivo (Mohanavalli, et al., 1991).

16. Boerhavia diffusa L.

Family: NYCTAGINACEAE

Synonyms: Partly Boerhavia repens var. diffusa (L.) Hook; Boerhavia ascendens Willd.; Boerhavia punarnava Saha & Murthy (White flowered Indian variety).

Botanical description: A herb, scandent in habit.

Distribution: Throughout India.

Vernacular Names

E - Hog weed; H - Sant; S - Punarnava; K - Sanadika; Mal - Tamilama; Tam - Mukaratte-kirei; Tel - Punarnava.

Parts used: Whole plant.

Medicinal Uses

a) Ayurveda: It is used as a mild laxative and febrifuge. The roots are useful as an expectorant and in asthma. It is an emetic in large doses. The roots are softened by boiling and used as poultice to draw boils. Boerhavia diffusa is also effective against ophthalmic complaints such as cataract, corneal opacity and myopia.

b) Others: The plant is effective against convulsions (Oliver-Bever, 1986). In Africa roots are used to extract guinea worms.

Chemistry: The plant (mostly roots) contains an alkaloid Punarnavine boerhavic acid, reducing sugars, potassium
nitrate, tannins including phlobaphens (Oliver, 1960; Singh and Udupa, 1972a). It also contains the flavones quercetin and quercitrin, oleanolic glycoside and β-sitosterol.

Punarnavine, intravenously increases blood pressure (Chopra, et al., 1956). It is extremely active in cases of cirrhosis of liver and chronic peritonitis (Chopra and Ghosh, 1923). The anti-inflammatory and diuretic action of punarnavine have been confirmed (Mudgal, 1975). The drug is very effective in internal inflammation, oedema and asthma. 4 mg of aqueous extract or 100 g acetone extract inhibits arthritis. The action of aqueous extracts in inhibiting serum amino transferase action is like that of hydrocortisone (Chopra et al., 1956; Subramanian and Ramakrishnan, 1965; Subramanyam et al., 1965; Bhalla et al. 1968, 1971; Misra and Tiwari, 1971; Singh and Udupa, 1972 a,b,c; Srivasta et al., 1972; Mudgal, 1975).

Punarnavine is a potent vasodialator effective on central nervous system and also is antiviral.

Botanical Notes: The Sanskrit name for Boerhavia diffusa is 'Punarnava' meaning 'new again' appears to be appropriate.

17. Calotropis gigantea (L.) R.Br.

Family : ASCLEPIADACEAE

Botanical description : Stout, hairy-tomentose shrub, with milky sap.

Distribution : Common throughout India.

Vernacular Names

E - Gigantic swallowwort, Mudar; H - Ak, Madar; S - Arka, Mandara, Surya Pattira; K - Ekkemale; Mal - Erikkka; Tam - Arkkam, Erukku; Tel - Jilledu, Arkamu, Mandaramu.

Parts Used : Root, root-bark, resin, latex, leaves and powdered flowers.

Medicinal Uses

a) Ayurveda : Root-bark used in dysentery, as a substitute for Ipecacuanha as a diaphoretic, expectorant and emetic. In the form of a paste it is applied to swellings due to elephantiasis.
Tincture of leaves is used in intermittent fevers.

Latex is an irritant and used in combination with Euphorbia neriifolia, as a purgative and in extra growths.

Powdered flowers are used in colds, coughs, asthma and indigestion.

An extract of the latex is injected into the lymph sac of a frog caused slowing of the heart and acute gastroenteritis.

b) Homeopathy: Arka has great therapeutic value in ascites, catarrh, chronic rheumatism, elephantiasis, pneumonic tuberculosis, poisonous snake bite, leprosy, skin disease and syphilis.

c) Siddha: Flowers are an aphrodisiac.

d) Unani: Used as a caustic, in piles, aches, skin diseases, dropsy and is an anthelmintic. Leaves and branches are used as resolvent, in paralysis and anaesthesia, as well as in toxic asthma.

Chemistry: Bitter resins, akundarin, calotropin are present. Latex contains 0.45% uscharin, 0.15% calotoxin and 0.15% calactin. A fatal dose of uscharin is 0.5 µg and of calotoxin, 0.7 µg per gram of body weight of frog. Cardioactivity in cats (compared with ouabain taken as 100) is: Calotropin 83, calotoxin 76, uscharin 58. Latex also contains α-calotropeol, β-calotropeol, β-amyrin and calcium oxalate, it also yields a nitrogen and sulphur containing fish and cardiac poison, gigantin. Latex also contains traces of glutathione and a proteoclastic enzyme similar to papain.

Stem-bark contains α- and β-calotropeols, β-amyrin, giganteol; flowers contain esters of α- and β-calotropeols and β-amyrin.

Root bark contains β-amyrin, two isomeric crystalline alcohols, giganteol and isogiganteol.

**Family**: ASCLEPIADACEAE

**Botanical description**: Branched, tomentose shrub.

**Distribution**: Abundantly found in the north west Himalayan tracts. Its occurrence in the rest of India is controversial.

**Vernacular Names**

E - Swallow-wort; H - Akada, Mudar; S - Alarka; K - Kempu ekkadagida; Tam - Vellerukku; Tel - Jilledu.

**Parts used**: Root-bark, stem, latex, wood, floss and flowers.

**Medicinal Uses**

**Ayurveda**: A soup prepared from dried root bark is used to treat colic and as a stomachic. An ointment is made from the burnt root for skin ailments (Dalziel, 1937). Root-bark used for leprosy (Ambasta, 1986), dysentery, as an expectorant and emetic. The latex which is acidic is used as a rubefacient and to remove guinea worms (*Dracunculus medinensis*). Powdered flowers are used in colds and asthma.

**Chemistry**: The latex and bark contain cardenolides, calotroposide and a proteolytic enzyme calotropain. The cardenolides (heterosides) are used as cardiotonics and are cytotoxic, whereas the proteolytic enzyme is anthelmintic, said to be more active than papain, bromelin or ficin (Atal and Sethi, 1962; Garg et al., 1963). Besides the heteroside, the latex contains calactin, amyrin and an aglycone, calotropagenin.

Hesse et al., (1941) detected \(-\)-lactucerol as the major constituent in the ethanolic extract of the latex. The other compounds present are calotropin, calotoxin, procerocid, syriogenin, taraxasterol, uscharin, uscharidin, uzarigenin and voruscharin (Pant and Chaturvedi, 1989).

A new pentacyclic triterpene has been isolated from the latex (Khan et al., 1988).

Aqueous and alcoholic extracts of roots produces initial depression followed by stimulation of myocardial contractions in frog and rabbit hearts (0.2 ml/kg).
A marked vasoconstriction and constant rise in blood pressure in dogs was observed (Derasari and Shah, 1965).

19. **Cardiospermum halicacabum** L.

**Family**: SAPINDACEAE

**Botanical description**: Tendril bearing vines with pinnately compound leaves.

**Distribution**: India, chiefly Bengal and U.P.

**Vernacular Names**

E - Balloon vine or winter cherry; H - Kanphata; S - Jyotishmati; K - Kanakaia; Mal - Ulinja; Tam - Moodacoatan; Tel - Buddakakara.

**Parts Used**: Roots, herb and seeds.

**Medicinal Uses**

a) **Ayurveda**: Root and the leaves are diuretic, laxative, stomachic, alterative and emetic; externally as rubefacient.

Root and the leaves of the herb in decoction are used in rheumatism, nervous diseases, piles, chronic bronchitis and phthisis. Leaves fried are applied to the pubis to increase the menstrual flow in amenorrhoea. Leaves boiled in oil is applied over rheumatic pains, swellings and tumours. Juice of the plant is dropped into the ear in earache. Decoction of the root given in snake bite.

b) **African uses**: In Nigeria the leaves are rubbed on the skin for the treatment of skin eruptions and itch. The juice of the stem is dropped in the eye to treat ophthalmia. The seeds, if eaten in plenty by children, may develop epileptiform convulsions.

**Chemistry**: Seeds or fruits yield a bitter and stimulant essential oil. Plant contains saponin. Stigmasterol and quebrachitol have been isolated and proanthocyanidin and apiogenin have been isolated from alcoholic extracts of the roots (Dass, 1966).

The essential oil from the seeds acts on ophthalmias (Modi and Deshmankar 1972; Shukla et al., 1973).
20. *Cassia fistula* L.

**Family**: CAESALPINIACEAE (LEGUMINOSAE)

**Botanical description**: A moderate sized tree, bark grey, stem woody, cylindrical branchlets green, glabrous and drooping.

**Distribution**: Throughout India.

**Vernacular Names**

E - Indian Laburnum, Golden-shower; Pudding-pipe tree, purging Cassia, Purging Fistula; H - Amaltas, girimalah, kirala. S - Suvarnaka, rajataru; K - Kakke, kakkegida; Mal - Konna; Tam - Konnei; Tel - Rela, Rella.

**Parts Used**: Root-bark, stem bark, wood, leaves, pulp of fruit, dried fruits and seeds.

**Medicinal Uses**

*Ayurveda*: Cassia pods of commerce used in medicine in the tropics. Dried fruits used as a purgative and laxative for habitual constipation. Root bark extract found satisfactory as a substitute for Cassia Beareana Liquidum in the treatment of black water fever. Root-bark, seeds and leaves are laxative. Fruit, a cathartic, applied in rheumatism and snake bite.

Seeds are emetic. Root - astringent, tonic, febrifuge, purgative, juice of leaves used in skin diseases.

Pulp of fruit is an effective and safe purgative and it is an ingredient of laxative preparations. Fruit is also useful in asthma.

Lillykutty and Santhakumari (1969) studied the antibacterial action of the leaves, stem bark and fruit pulp of *Cassia fistula* and found the fruit pulp to be the most potent. The ether soluble fraction of the pods had the most potent activity against *Staphylococcus aureus*, *Staphylococcus albus*, *Bacillus megaterium*, *Shigella flexneri*, *Shigella shiga* and *Salmonella paratyphi* A and B.

The pods and stem bark of *Cassia fistula* have an antiviral activity against Newcastle disease virus and Vaccinia virus (Cutting et al., 1965). Extracts have a hypoglycaemic action in rats (Dhar et al., 1968).
Chemistry: The leaves of **Cassia fistula** have free rhein, rhein glucoside and sennoside A and B (Kaji et al., 1968).

A butanol extract of the powdered stem bark contained tannins, while the benzene extract yielded lupeol, B-sitosterol, and hexacosanol (Sen and Shukla, 1968). From the alcoholic extract of the pods a new anthraquinone (fistulic acid) was obtained (Agrawal et al., 1972). An acetone extract of the flowers contained kaempferol and a proanthocyanidin. In the bark a leucopelargonidin trimer was found (Narayanan and Seshadri, 1972).

Leaves contain anthraquinone derivatives and very little tannin; root bark, besides tannin, contains phlobaphenes and oxy-anthraquinone. Pulp contains rhein, the major anthraquinone derivative, a small amount of volatile oil, three waxy substances and a resinous substance.

### 21. Cedrus deodara (Roxb.) Loud.

**Family**: PINACEAE

**Botanical description**: Trees, short shoot or spur fascicled, monoecious. Cone scales are flattened.

**Distribution**: Himalayas, cultivated in India as an ornamental tree.

**Vernacular Names**

E - Deodar cedar, Deodar, Himalayan Cedar; H - Deodar, Dhar, Paludar; S - Devadaru, deodaru; K - Devdari, Devadaru; Mal - Devadaru; Tam - Tevadari, Toon-Maram; Tel - Devadri, Devadaru.

**Parts Used**: Bark, gum, wood, leaves and oil.

**Medicinal Uses**

a) **Ayurveda**: Wood - diaphoretic, diuretic, carminative, useful in fever, flatulence, pulmonary and urinary disorders, rheumatism, piles, gravel in kidney, antidote to snake bite.

Wood yields an oleoresin and a dark coloured. Oil which is diaphoretic, which is used in skin diseases and for ulcers.
Bark is an astringent, useful in fevers, diarrhoea and dysentery.

Needles yield an essential oil.

b) Unani: Resolves inflammation, antispasmodic, anti-poison, used in paralysis, stone in the kidney and fevers.

Chemistry: Gum, cholesterol, essential oil, wood yields oil with balsamic odour, needles contain ascorbic acid. Fresh needles contain 0.056% of ethereal oil.

Alcoholic extract of stem contains sesquiterpenes which have a papaverine like spasmylytic activity.

22. Cinnamomum camphora (L.) Nees et Eberm.

Family: LAURACEAE

Botanical description: Camphor tree of Japan, sometimes cultivated in India.

Distribution: It is generally imported from China and Japan; cultivated occasionally.

Vernacular Names

E - Camphor; H - Kapur; S - Karpoor; K - Karpura; Mal - Karpooram; Tam - Karppuram; Tel - Pacha Karpooram.

Parts Used: Wood oil.

Medicinal Uses

a) Ayurveda: Diaphoretic, stimulant of skin cardiac stimulant, antiseptic, antispasmodic, internally an expectorant, sedative, temporary aphrodisiac, narcotic, carminative and externally an anodyne. In large doses anti-aphrodisiac.

Camphor is bitter, pungent, and aromatic. It is useful in good in typhus, confluent small pox, all fevers, measles, whooping cough, hiccup, hysteria, epilepsy, rheumatism, diarrhoea and toothache. Promotes perspiration and induces sleep. Administered on the abdomen in uterine pains.
b) Siddha: In poisoning and treating foul smell (Nadkarni, 1954).

c) Unani: Antipoison, brain tonic, in diarrhoea, stomatitis, headache and irritation of liver and kidney.

Chemistry: Camphor treated with chloride of zinc and distilled is converted into cymene or cymol. When treated with nitric acid it forms camphoric acid. In addition to camphor obtained from the root and the wood, it also contains safrole (Chopra, et al., 1956).

23. Cinnamomum tamala (Buch.-Ham.) T. Nees et Eberm.

Family: LAURACEAE

Botanical description: A small tree with aromatic bark and leaves.

Distribution: Sub-tropical Himalayas and tropical Himalayas; cultivated.

Vernacular Names

E - Indian Cassia lignea; H - Tejpat, Dalchini; S - Tamalaka, Tejpatra, Tamalapatra; K - Adavilavangpatte; Mal - Karuntoli; Tam - Talishappattti, kattu-karuvapattai; Tel - Talisapatri.

Parts Used: Bark, leaves and oil.

Medicinal Uses

Ayurveda: Bark aromatic, used in gonorrhoea.

Leaves are carminative and are used in colic and diarrhoea. Leaves used in rheumatism, and scorpion-sting (Nadkarni, 1954).

Chemistry: Leaves yield essential oil which resembles cinnamon leaf oil and contains d-L-phellandrene and 78% eugenol. Essential oil from bark contains 70-85% cinnamic aldehyde.

Uses as food: Leaves are used as condiment, for flavouring tea and also as substitute for betel leaves. Bark is a common adulterant of true cinnamon.
24. *Cinnamomum zeylanicum* Blume

Family : LAURACEAE

Botanical description : An evergreen tree with aromatic bark and trinerved leaves.

Distribution : Kerala and Western Ghats; Cultivated in South India.

Vernacular Names

E - Cinnamon tree, Ceylon Cinnamon; H - Dalchini; S - Tamalapatra; K - Dalchini, lavangpattai; Mal- Lowanga-pattai; Tam - Cannalavangapattai, ilayangam; Tel - Dalchina chekka.

Parts used : Bark, leaves and oil.

Medicinal Uses

a) Ayurveda : Used as astringent, stimulant and carminative and also for checking nausea and vomiting. Cinnamon bark oil used for gastric troubles. Bark is antispasmodic, aromatic, haemostatic and germicide. Oil is a vascular and nerve stimulant; in large doses an irritant and narcotic.

b) Homeopathy : Cinnamon is used in subcutaneous haemorrhages when the skin is intact.

c) Unani : Stomachic, diabsorbent, diuretic, aphrodisiac and demulcent. Externally it is used for colds, headache and liver complaints.

The oil is locally applied with benefit in neuralgia and headache, as an antiseptic and in gonorrhoea. Internally in typhoid fever. It is used as an adjunct to bitter tonics, purgatives, vegetables and mineral astringents and also as a powerful stimulant in amenorrhoea.

Chemistry : Dry bark from small stems and twigs contain 0.35 - 0.71% essential oil having 48-76% aldehydes. Essential oil (2.0%) contains 70-90% eugenol, a source of clove oil. Green leaves yield about 1% oil. Cinnamon leaf oil equals clove oil in eugenol content (70-95%); root bark yields 3% oil which differs from both stem bark and leaf oils.

Uses as food : Cinnamon of commerce is dried inner bark which is available in the form of long tubes, termed
'quills', and has a delicate fragrance and warm sweet taste. It is extensively used as a spice or condiment. The essential oil, obtained from bark, is largely consumed in flavouring and pharmaceutical industry. Powdered cinnamon used in chocolates and dentrifices. Cinnamon Bark oil used for flavouring confectionery and liquors. Bark and leaves yield essential oils. Seeds yield a fixed oil. Cinnamon leaf oil is a common adulterant of cinnamon bark oil.

Cinnamic aldehyde being cheaper than cinnamon oil, is being used in chewing gums and chocolates.

25. **Cissampelos hernandifolia** Willd. &

**Cissampelos pareira** L.

*Family*: MENISPERMACEAE

*Botanical description*: Twining perennial shrubs.

*Distribution*: Tropical and sub-tropical tracts of India.

*Vernacular Names*

E - False pareira root, False pareira brava, velvet leaf; H - Akanadi, Patat ki bel, Harjori; S - Ambashtha, Patha, Laghu patha; K - Padavali, Nimukha Paddali Pata; Mal - Kattuvalli; Tam - Appatta; Tel - Adivi banka tige, pata.

*Parts Used*: Roots, bark and leaves.

*Medicinal Uses*

a) **Ayurveda**: Roots are bitter, used in diarrhoea, dysentery, colic pains, cough and urinary troubles. Alkaloid hayatine isolated from roots and vines, is a substitute for curare, d-tubocurarine and other curariform drugs (muscular relaxants). Roots are diuretic, antiperiodic, purgative, antilithic used in dyspepsia and dropsy.

Roots used in urinary trouble like nephritis, catarrhal affections of the bladder, cystitis and in snake-bite and scorpion sting.

b) **African uses**: Roots are used locally as an emmenagogue, abortifacient and antipyretic. (Oliver-Bever, 1966).
Leaves - external application for itch, sores, scabies and other skin diseases.

Chemistry: Alkaloids hayatine, sepeerine, bebeerine, cissampeline and pelosine (0.5%) present in the roots; besides the alkaloid the plant extract contains saponin and abundant quaternary ammonium bases. Alkaloids hyatin, hyatinin, a quercitol and a sterol were isolated from the roots. Hyatin methodeide (and methochloride) possess almost equal degree of curariform activity as of d-tubocurarine.

The bark contains cyleanine, hyatinine, hyatine, dicentrine and dehydrodicentrine. Leaves contain cissampareine and cissamine.

Cissampareine from the bark was found to have significant inhibitory action against human carcinoma cells of the nasopharynx in cell culture (Kupchan et al., 1965).

Taxonomic Notes: There is a problem in the taxonomy and nomenclature of this species. A part of the species is considered as Cissampelos mucronata A. Rich., and another part as Cissampelos owariensis Beauv. ex DC. which was Cissampelos pareira L., var. owariensis (Beauv. ex DC.) [Oliver-Bever, 1986].


Family: RUTACEAE

Botanical description: A shrub or small tree.

Distribution: All over the country.

Vernacular Names

E - Lime; H - Nimbu, Kaghzi-nimbu; S - Jambha; K - Limbe, Nimbe; Mal - Erumichinarakam; Tam - Elumichai; Tel - Nimma.

Parts used: Oil from leaves, flowers, fruits, rind and juice.

Medicinal Uses

Ayurveda: Fruits considered appetizer, stomachic and antiscorbutic. A good source of vitamin C. Refrigerant. Fruit juice is also used in rheumatism. Lime juice is most
useful in dysentery with sloughing of the mucous membranes. It is used as a gargle in cases of ulcerations of the mouth and sponginess of the gums. Juice added to strong black coffee relieves malaria. Rubbed on the scalp, it helps to remove dandruff.

Chemistry: Lemon juice contains citric acid, phosphoric acid and malic acids, sugars and mucilage. Lemon peel contains a volatile oil and hespiridin. Citroflavanoids are extracted from the peel of citrus fruit. They consist of a mixture of which the main constituents are hesperidoside (rhamnoside of hesperetol), naringoside and eryodictyoside (flavonones).

Lemon juice enters the blood as alkaline citrates, potassium salts and phosphoric acid. Potassium salt and phosphoric acid act upon the red corpuscles. They precipitate uric acid and promotes the formation of calculi. Fresh juice is used in preventing the early stages of cataract (Dr. A. Lakshmi Pathi).

Uses as food: Limes are used for fresh juice and for flavouring foods. Oil distilled from fresh peel is mainly used in confectionery. Fruits used for culinary purposes, flavouring jams, jellies, marmalades and alcoholic drinks and as a garnish.

27. Citrus aurantium L.

Family: RUTACEAE

Botanical description: A small tree.

Distribution: Cultivated in Guntur, A.P.

Vernacular Names:
E - Sour, bitter, seville, bigarde orange; H - Khatta; S - Nagranga; K - Heralay, Limu, Nimbu; Mal - Karna; Tam - Narangam, narattai; Tel - Mallikanarangi.

Parts Used: Leaves, flowers, fruits and rind.

Medicinal Uses:
Ayurveda: Rich source of provitamin A and B₁. Rind is aromatic, stomachic, tonic, astringent, mild carminative and
antiscorbutic. Oil from the flowers is not only a perfume but also antispasmodic and anodyne.

Juice is stimulating, refreshing and refrigerant. The fruit is a blood purifier and appetiser. Juice is valuable in bilious affections and stops bilious diarrhoea. Dried peel is antiemetic and anthelminthic. Roasted pulp is an excellent application to foetid ulcers. Orange poultice is used in psoriasis.

Chemistry: Rind of the fruit contains a volatile oil, gum-resin, terpene, limonene, the glucosides hesperidin, isohesperidin and aurantiamarin and a bitter crystalline principle. Flowers contain oil of neroli. Juice of the orange contains mainly of mucilage, sugar, citric acid and inorganic salts.

The laevulose in the juice is beneficial for the diabetics.

Uses as food: Used in the preparation of confections, marmalades, liqueurs and other drinks. Orange marmalade upon bread is good for dyspeptic patients.

28. Citrus limon (L.) Burm. f.

Family: RUTACEAE

Synonym: C. medica L. var. limonum Watt

Botanical description: A small thorny tree.

Distribution: Cultivated all over India.

Vernacular Names

E - Lemon; H - Baranibuf, jambira, paharinimbu; S - Mahanimbu; K - Bi japura, bijori; Tam - Periya yelumichai; Tel - Nimma, Dabba.

Parts Used: Leaves and fruits.

Medicinal Uses

Ayurveda: Oil of Lemon, used as a carminative. Lemon juice is very useful for scurvy. Fruit in the form of pickle useful in hypertrophy of spleen.
Rind of ripe fruit is stomachic, and carminative.

Juice of ripe fruit - antiscorbutic, refrigerant, in scurvy, in rheumatism, dysentery and diarrhoea.

Fruit is used in stomach pain, cough, nausea, vomiting, thirst, indigestion, loss of taste and worms.

Chemistry: Peel yields an essential oil. Oil from peel yields d-limonene, d-L-pinenene, camphene and linalool.

Lemon juice contains an anti-pneumonia factor. Juice is bactericidal. Peel contains bitter principle, essential oil and hesperidin.

Uses as food: Used mainly for culinary purposes and in the preparation of beverages. Citric acid, pectin and lemon oil are obtained as byproducts. Oil of Lemon used for flavouring liqueurs. Peels are candied which is a good source of vitamins. Lemons are commonly used in preparation of squashes, lemonade and for confectionery purposes as flavouring agent.

29. Citrus limonum Risso

Family : RUTACEAE

Synonym : Citrus acida

Botanical description : Small tree with elliptic - oblong obtuse crenulate leaflets, apparently quite wild.

Distribution : Cultivated in India, common in Northern India.

Vernacular Names

E - Lemon; H - Jambira; S - Limpaka; K - Dodda nimbehannu; Tam - Periya elimichcham; Tel - Peddanimba.

Parts Used : Bark, rind of ripe fruit, juice and oil.

Medicinal Uses

Ayurveda: Rind is stomachic and carminative. Oil is bitter and aromatic. Juice is antiscorbutic and refrigerant. Bark
is used as febrifuge and seeds as a vermifuge. Oil is used to check postpartum haemorrhage and in rheumatic affections. Juice is taken for the relief of dyspepsia with vomiting and bilious headaches.

Chemistry: Citroflavanoids are extracted from the peel of citrus fruit. They consist of a mixture of which the main constituents are hesperidoside (rhamnoside of hesperetol), naringoside, and eryodictyoside (flavanones). The peel contains Vitamin C.

Citroflavanoids control the permeability of the blood vessels by decreasing the porosity of the walls and improve exchange of liquids and diffusion of proteins. They are also said to have anti-inflammatory, antihistamine and diuretic actions and can cause dilatation of the coronaries (Paris and Delaveau, 1977).

Uses as food: Used as a sauce, fruit is pickled; rind is a flavouring agent.

30. *Citrus medica* L.

**Family**: RUTACEAE

**Synonym**: *C. medica* var. *medica* proper of Watt

**Botanical description**: A small tree.

**Distribution**: Himalayan regions and Malnad areas of South, Western Ghats of Coorg and Nilgiris; cultivated.

**Vernacular Names**

E - Citron; H - Bara nimbu, bijaura, turanj; S - Amlakeshara, Begapura; K - Madala, mahaphala, rusaka; Mal - Gilam, rusakam, madalanarakam; Tam - Kadararanathai; Tel - Madeephalamu.

**Parts Used**: Fruit and rind.

**Medicinal Uses**

Ayurveda: Preserved rind used in dysentery. Root - anthelmintic. Useful in constipation, vomiting and urinary
calculus. Flowers and buds are stimulant and astringent. Ripe fruit is used as a stimulant and tonic. Juice is refrigerant, astringent and digestive.

Fruit is an expellant of poisons. Pulp is an excellent aromatic and stomachic. Rind is aromatic, stimulant, tonic and an antiscorbutic.

It is useful in bilious and remittent fevers and checks bilious vomiting. Also is used in scorpion sting and snake bite.

Used in E.N.T. disorders, epistaxis and as a cardiac stimulant, used in dyspnoea, cough, thirst and diseases due to reduced digestion.

Chemistry: Citron oil, also known as Oil of cedrat is obtained from fresh rinds. Oil contains citrene, limonene, citrol, cymene, dipentene and citronellal.

Uses as food: Fruits used mainly for pickling, also candied. Peel made into marmalades and other preserves. Candied peel is used for flavouring confectionery. Juice makes a refrigerant drink in allaying febrile heat and thirst. Rind used to convert wine into vinegar. Pulp of the fruit is eaten and preserved in sugar. Leaves used in flavouring.

31. Cocos nucifera L.

Family : ARECACEAE (PALMAE)

Botanical description : Monoecious tree, stem slender, unarmed, 40-50ft. high, marked with ring-like leaf-scars; leaves 6-15 ft. long, leaflets numerous, linear lanceolate, 2-3 ft. long, petioles 3-5 ft. long, stout; spadix 4-6ft. long, lower spathes 2-3ft. long; Fruit green or yellowish, 8-12 inches long the cavity containing a potable milky fluid.

Distribution : Cultivated in hot damp regions of India, especially near the sea.
Vernacular Names

E - Coconut palm; H - Nariyal; S - Narikela; K - Tengu, Tengina; Mal - Narikelam, thenna, thenga; Tam - Tenkai, Tennaimaram; Tel - Narike-lamu, Kobbari, Tenkai.

Parts Used : All parts.

Medicinal Uses

Ayurveda : Fruit - sweet, aphrodisiac, diuretic. Oil - local application in the loss of hair after fevers and debilitating diseases.

Water of unripe fruit - cooling useful in thirst, fever and urinary disorders.

Root - astringent, and used in uterine diseases and haemolytic jaundice.

Flowers - astringent.

Chemistry : Coconut milk contains enzymes - invertin, oxydase, catalase; amino acids - histidine, arginine, lysine, tyrosine, tryptophan, proline, leucine and alanine.

Yield of oil ranges from 57 to 75%. Oil contains lauric and myristic fatty acids, glycerides, phytosterol and squalene. Coconut water contains vitamins of B group. The nutshell constitutes phenols which have antifungal action (Gaind and Singla, 1966; Malathi et al., 1959).

Uses as food : A tree of great commercial value as it yields food, drink, oil, fibre, fuel and timber. Meat of the seeds eaten raw or used in sweetmeats, kitchen preparations, pastries and confectioneries; also much used as dry copra for extraction of fatty oil. Coconut oil employed in food products. Coconut milk is a refreshing drink. Toddy is obtained by tapping the peduncles and is convertible into arrack and 'jaggeri'. Kernel of the fruit is edible. Kernel is generally converted to 'copra' by drying. Copra is a source of coconut oil and oil cake. Oil is used for cooking and lubrication.

Oil is used as a substitute for ghee. Dessicated coconut is used in confectionery and bakery products.

The freshly cut tender terminal bud known as palm cabbage, is considered a delicacy and may be eaten raw or cooked.
32. *Coriandrum sativum* L.

**Family**: APIACEAE (UMBELLIFERAEE)

**Botanical description**: Herbaceous annual, aromatic.

**Distribution**: Indigenous to the Mediterranean region cultivated in England and India.

One of the oldest spices mentioned in early Egyptian papyri and by Sanskrit authors under the name Kustumbum. Cultivated for its seeds.

**Vernacular Names**

E - Coriander leaves; H - Dhania; S - Kustumbum, Dhanya; K - Kothambri; Mal - Kothumpalari; Tam - Kothamalli; Tel - Kothimeeri, Dhaniyalu.

**Parts used**: Leaves and fruits.

**Medicinal Uses**

**Ayurveda**: Fruits are used as stimulant, carminative, stomachic, heart tonic, diuretic, antibilious, refrigerant. Chewed to correct foul breath.

Fresh leaves are pungent and aromatic. Oil is useful in flatulent colic, rheumatism and neuralgia. Decoction of the dried fruit is used in sore throat, flatulence, indigestion, vomiting and bilious complaints. It finds its use in chronic conjunctivitis. Coriander is considered to lessen intoxicating effects of spirituous liquors and is used as a carminative in convalescence after diarrhoea.

**Chemistry**: The main constituents of the oil include d- and d-1-\(\text{L}\)-pinene, \(\beta\)-pinene, dipentene, p-cymene, d-linalool, geraniol and acetic acid. A brownish yellow liquid oleoresin is produced from the selected quality seed. It has a mild, sweet, warm and aromatic flavour. Essential oil is coriandrol. Oxalic acid and calcium content in fresh leaves are 0.012% and 0.172% and in air dry leaves 0.085% and 1.23%, respectively. Indian coriander contains 0.405% - 0.592% of essential oil. Besides essential oil, oil seeds contain 19-21% of a fatty oil. The fruit and leaves are rich source of vitamin C and of carotene. Oil causes irritation when in contact with the skin for a long time.
Uses as food: The leaves form an essential part of Indian cookery. In South India, it forms an essential constituent of several food preparations. It is also reported to be used in Chinese cookery. Fruits & leaves used as condiment for flavouring curries and soups. Coriander serves as a flavouring agent for bakery preparations, tobacco products and flavouring cocoa, chocolate and liquers, particularly gin. Oil of coriander is also used in perfumes. Fatty oil from seeds is used in the preparation of sodium soap. Cake used as fodder.

33. Crateva nurvala Ham.

Family : CAPPARACEAE (CAPPARIDACEAE)

Synonym : Crateva religiosa auct. (non Forst.)

Botanical description : A tree cultivated in gardens for its white and pale-yellow flowers in lax terminal corymbs.

Distribution : Almost all over India, wild or cultivated.

Vernacular Names

E - Three-leaved caper; H - Barna, Barum; S - Varuna, asmarighna; K - Narumbele; Mal - Nirvala; Tam - Maralingam; Tel - Magalingam.

Parts Used : Root-bark, stem bark, wood, leaves and flowers.

Medicinal Uses

a) Ayurveda : Bark - demulcent, stomachic, laxative, diuretic, antipyretic, alterative, tonic, useful in calculus affections, disorders of urinary organs and useful in snake bite. Fresh leaves and root bark - rubefacient. Bark stimulates liver, its extract used for promoting appetite; Flowers are astringent and cholagogue.

Leaf juice is given in rheumatism mixed with coconut milk and ghee.
Leaf is smoked in caries of the bones of the nose, and the smoke is exhaled through the nose. A paste of the leaves applied to the soles of the feet to relieve swelling and burning sensation.

In India, the stem bark has been used as an antipyretic, stomachic, laxative and diuretic (Chopra et al., 1956).

b) Others: In Nigeria the root is used as a febrifuge and the Yorubas apply the leaf as a mild counter irritant for headache (Dalziel, 1937). In the Philippines, the juice of the bark is used to treat convulsions. (Quisumbing, 1951).

Chemistry: Bark contains saponin and tannin.

In India, the bark was found to contain a gum, a saponoside and tannins. From the air dried powdered bark, the triterpenes lupeol, beta-sitosterol and lupeol acetate have been isolated. The water soluble portion contained traces of bases and sugars. The tertiary bases were found to contain both sulphur and nitrogen (Bhandari and Bose, 1954; Chakravarti et al., 1959; Kjaer and Thomsen, 1963; Smolenski et al., 1972; Kondagbo and Delaveau, 1974). In the leaves and twigs flavonoids were extracted mainly rutin, quercetin and isorquercetin have been reported (Hegnauer, Vol. 3, p. 362).

The air dried bark has spasmodic action and cholinergic action. Nicotinic action of the extract on the ganglia has also been noted by Deshpande (1973). A powder of the whole plant has been observed to improve the tone of the urinary bladder and to control urinary tract infections (Deshpande, 1973).

Extracts of the stem bark inhibits acute inflammation (Ramjelal et al., 1972).

Total extracts had an inhibiting effect towards Shigella dysenteriae and the leaves and stem bark had considerable anticancer action on sarcoma 180 (Kerharo and Adam, 1974) and leaves on lung cancer (Abbot et al., 1966). (Oliver-Bever, pp. 121, 145, 212).

Taxonomic Notes: The Indian and African taxa are different; taxonomic research is needed.
34. *Crotalaria juncea* L.

**Family**
: FABACEAE (LEGUMINOSAE; PAPILIONACEAE)

**Botanical description**
: A tall shrub with prominently grooved and striated stems, sparsely clothed with yellowish silky hairs.

**Distribution**
: Cultivated throughout India.

**Vernacular Names**
- E - Sunn or SANN HEMP; H - Sannai Sunn; S - Sanna; K - Sanabu; Mal - Wuckoo nar; Tam - Sannappu, sanal, janupa; Tel - Janumu, Shanama.

**Parts Used**
: Bark, stem, leaves, flowers & seeds.

**Medicinal Uses**

**Ayurveda**
: Seeds used to purify blood, in impetigo, psoriasis, emmenagogue; poisonous to livestock.

**Leaves**
: Refrigerant, demulcent, emetic and purgative, emmenagogue and abortive. Root is astringent.

**Bitter leaves**
: Used externally and internally in the form of infusion in gastric and bilious fevers accompanied by skin diseases such as impetigo and psoriasis.

**Root**
: Useful in colic and as astringent in epistaxis also.

**Chemistry**
: Leaves contain an abundance of mucilage.

**Uses as food**
: Flowers are eaten as vegetable.

35. *Cuminum cuminum* L.

**Family**
: APIACEAE (UMBELLIFERAE)

**Botanical description**
: A herb, slender stem branched above.

**Distribution**
: Cultivated throughout India except Bengal and Assam.
Vernacular Names

E - Cumin seed; H - Jira, Zira; S - Jiraka; K - Jeerige; Mal - Jorekam; Tam - Shiragam; Tel - Jiraka, Jilakarra.

Parts Used : Fruits and seeds.

Medicinal Uses

a) Ayurveda : Fruit stomachic, stimulant, carminative, astringent, useful in dyspepsia, dysentery and diarrhoea and refrigerent. Also used in veterinary medicine and in snake bites. Useful in hoarseness of voice and as uterine tonic.

b) Unani : Astringent, carminative, digestive, in enlarged spleen, hiccough, diuretic and emmenagogue.

Chemistry : Essential oil from the fruit is cuminol. Besides volatile oil, fruits contain also a fixed oil with strong aromatic flavour, a mixture of hydrocarbons, cymene or cymol and terpene.

Uses as food : Fruit used solely or in mixed spices for flavouring purposes. Essential oil is used for flavouring beverages, liquers and cordials. Cumin seeds are sometimes used like caraway seeds.

36. **Cymbopogon caesius** Stapf

*Family* : POACEAE (GRAMINEAE)

*Botanical description* : A tall, perennial, sweet-scented grass.

*Distribution* : From Punjab to Bengal, Maharashtra, Andhra Pradesh, Karnataka.

Vernacular Names

E - Rosha grass, Palma rosa, Camelhay, Geranilum grass; H - Rousaghas, Gandhejghas; S - Bhutika; Tam - Shakanarupilla.

Parts used : Whole plant.
Medicinal Uses

Ayurveda: Leaves yield Rosha oil used in medicines for skin diseases and lumbago, rheumatism and neuralgia. Decoction of the grass is used as febrifuge. The plant is aromatic and used as stimulant.

Aromatic oil is stimulant, carminative, antispasmodic and diaphoretic.

Oil is useful in flatulence and spasmodic affections of the bowels. Externally it is used like the oil of lemon grass in conjunction with or as cajeput oil.

37. *Cyperus rotundus* L. & *Cyperus scariosus* R. Br.

Family: CYPERACEAE

Botanical description: Tuberous, rhizomatous, perennial herbs, with slender stolons; stem leafy at the base.

Distribution: A perennial sedge distributed throughout India.

Vernacular Names

E - Nut grass; H - Mutha, motha; S - Mustaka, musta; K - Tungegadde, Bhadra hullu; Mal - Karimuttan; Tam - Korai; Tel - Tungamusta.

Parts Used: Dried tubers.

Medicinal Uses

a) Ayurveda: Dried tubers are accredited with diuretic, diaphoretic and astringent properties, used in stomach and bowel complaints.

Tubers are an emmenagogue, digestive and uterine stimulant. Infusion is used in vomiting, cholera and amoebiasis. In large doses it is used as an anthelmintic (Chopra et al., 1956, p.88; Hegnauer, 1964). Fresh tubers are applied to the breasts in the form of a paste as a galactogogue.

b) Unani: Diuretic, emmenagogue, aphrodisiac, in bladder stones, to strengthen memory, in chronic fevers, palpitation, loss of appetite and in scorpion bite.
c) African uses: In Nigeria the tuberous rhizomes are used as cough medicine in children. In Congo the pulp of tubers is used in oedema and rheumatism (Dalziel, 1937; Bouquet, 1969).

Chemistry: Dried tubers yield an essential oil. Indian tubers contain less than 0.5% essential oil containing pinene, traces of cineole, sesquiterpenes and a new alcohol iso-cyperol. The fatty oil contains 2.7% of a neutral waxy substance, glycerol, linolenic, linolic, oleic, myristic and stearic acids, and an unstable alkaloid.

Obturastyrene (Cinnamylphenol), the active constituent of the plant, which acts on Staphylococcus aureus Towers and Wat (1979), Khan et al. (1980b).

Taxonomic Notes: There is a problem of distinguishing between Cyperus rotundus and Cyperus scariosus and the collections are frequently mixed.

38. Dalbergia sissoo Roxb.

Family: FABACEAE (LEGUMINOSAE; PAPILIIONACEAE)

Botanical description: A tree reaching 60 ft. high, young stems, tomentose branches numerous, spreading, leaves acuminate.

Distribution: Extensively planted throughout India.

Vernacular Names:
E - Sissoo; H - Shisham, Sisu; S - Shingshupa; K - Hambadavu; Mal - Tal; Tam - Sisu; Tel - Sinsupa.

Parts Used: Roots, stem bark, wood, leaves and mucilage.

Medicinal Uses:
Ayurveda: Roots astringent. Dried bark and fresh leaves are used as a local astringent and haemostatic in various forms of haemorrhages, epistaxis, haematemesisis, bleeding piles and varicose veins. Wood alterative, useful in leprosy, boils, eruptions and to allay vomiting. Heartwood used in fever and urinary complaints. Leaves a bitter stimulant. Decoction of leaves useful in gonorrhoea. Mucilage of the leaves is good in excoriations.
Chemistry: Pods contain 2% tannin. The wood and stem contain Dalbergichromene neoflavonoids which are anti-inflammatory and anti-arthritic (Mukherjee et al., 1971).

The Indian species Dalbergia latifolia also contains Dalbergichromene (Kishore and Tripathi, 1966; Singh and Chaturvedi, 1966; Tripathi and Kishore, 1967; Hye and Gafur, 1975). The cyclitols in Dalbergia sissoo act as fat metabolisers and improve sensory function.

Biochanin a derivative of isoflavone, was found to be oestrogenic (Farnsworth et al., 1975a). They correct menopausal disturbances and dysmenorrhea or menorrhagia (Oliver-Bever, 1986).

39. **Elephantopus scaber** L.

**Family**: ASTERACEAE (COMPOSITAE)

**Botanical description**: A stiff subscapigerous herb with obovate oblong basal leaves.

**Distribution**: Found throughout India in the forests.

**Vernacular Names**

E - Blue - Elephant's foot, prickly - leaved Elephant's foot; S - Adhomukha, Darvika; H - Gobhi, Sandulun; K - Hakkarike; Mal - Anashovadi; Tam - Anashovadi; Tel - Eddumalikechettu, Enugabira.

**Parts Used**: Whole Plant.

**Medicinal Uses**

a) **Ayurveda**: Mucilaginous decoction of plant used as an emollient in dysuria, diarrhoea, dysentery, swelling and stomach pains. Root is prescribed to arrest vomiting, powdered with pepper applied in toothache. Leaves used in applications for eczema and ulcers.

In Travancore a decoction of the plant is given in dysuria, the bruised leaves are given with rice internally for swellings or pains in the stomach. In Chota Nagpur a preparation from the root is given for fever.
b) Others: The Mundas use the roots as a remedy in diseases believed to be caused by a spell. The plant is used as a diuretic in Indo-China, as a diuretic and febrifuge in Madagascar, and as a vulnerary in Jamaica.

In the French Islands of the West Indies the herb is considered as tonic, diaphoretic and emmenagogue. The warm infusion is given in dyspepsia, intermittent fevers and menstrual derangements due to colds. The herb is used in Brazil as an emollient and discutient in the form of a decoction or a poultice. A decoction of the root is prescribed in asthenic fevers.

40. *Elettaria cardamomum* (L.) Maton

Family : ZINGIBERACEAE

Synonym : *Amomum cardamomum* L.

Botanical description : A tall, herbaceous perennial. Leafy stem.

Distribution : Native to India, cultivated as pure plantation crop in the Western Ghats in Karnataka, Kerala and Tamilnadu.

Vernacular Names

E - Cardamom, lesser cardamom; S - Upakunchika, ela; H - Choti-elachi; K - Yelakkki; Mal - Yelam, Elattari; Tam - Yelakkai; Tel - Yelakkayalu.

Parts Used : Fruits and seeds.

Medicinal Uses

a) Ayurveda : Seeds are used as carminative, aromatic, stimulant and diuretic.

b) Unani : Checks nausea, vomiting, headache, refrigerant, diuretic, resolvent, cardiac stimulant, absorbs moisture, expels wind, helps digestion and hepatic colic.

Chemistry : Seeds yield an essential oil, oleum cardamoni, with limonene, d-a-terpineol, borneol, cineol and sabinene as important constituents.
Uses as food: Seeds used as a spice, masticatory, condiment in cordials, bitters and other pharmaceutical preparations and as a flavouring. Cardamoms are often included in betel quid, used for flavouring cakes and curries. Seeds are also used in flavouring liquors and bitters.

41. *Embelia ribes* Burm.

Family : MYRSINACEAE

Botanical description : A climbing shrub with large tubercles at the base of the stem.

Distribution : Occurs throughout India upto 5,000 ft.

Vernacular Names

H - Viranga; S - Vidanga; K - Vayubaliga; Mal - Vizhal; Tam - Vayu-vilangam; Tel - Vellal, Vaividungamu.

Parts used : Root bark, leaves and berries.

Medicinal Uses

a) Ayurveda : The basic effects of *Embelia ribes* are the anthelmintic against Taenia and ascarides.

b) Others : The African species *Embelia schimperi* Vatke (= *E. abyssinica* Bak.) have similar uses.

An overdose of the berries of the African species was reported to be fatal; possibly due to a toxalbumin fraction (Watt and Breyer-Brandwijk, 1962; Oliver-Bever, 1986).

c) Unani : Used as a vermifuge in puerperal condition.

Chemistry : The berries contain 2.5-dihydroxy-3-undecyl-benzoquinone (embe lin) of 6-7.5% in the African and 2.5-3% embelin in the Indian species. Quercitol, fatty acids, christembine (an alkaloid) were also reported (Chopra, et al., 1956; Kapoor, et al., 1975). The African embelin probably contains the toxalbumin.

The cyclitols act as fat metabolisers and improves the sensory function. In addition to potent antibacterial
action, protective action on teeth possibly due to the
former and oestrogenic action is also known.

African embelin is a potent taeniacide. However, the Indian
embelin had no effect on Taenia and hookworm but was very
effective on Ascarides eliminating ova (Oliver-Bever, 1986).
The worms and ova were expelled without requiring purging.
Guru and Mishra (1966) noted no toxicity with the Indian
embelin unlike in the case of the African embelin which
probably needed to be isolated from toxalbumin (Oliver-
Bever, 1986).

Aqueous extracts of the berries are antibacterial, effective
against Staphylococcus aureus and Escherichia coli (Chopra,
et al., 1956). Analogues of embelin were obtained by
chemical substitution. Anthelmintic properties were vastly
improved with isobutyl-emelin or n-hexylamino-emelin while
di-amines were ineffective (Gupta, et al., 1976). The two
former analogues were effective against flukes
(Paramphistomum cervi), round worms (Trichuris ovis) and
tapeworms (Oesophagostomum columbianum and Dipylidium
caninum).

Uses as food: Tender leaves and fruits are cooked and
eaten.

42. Embelia tsjeriam - cottam A.DC.

Family : MYRSINACEAE

Botanical description : A large shrub with greenish white
flowers, long racemes with red
berries.

Distribution : India and Burma.

Vernacular Names

H - Baberang; S - Vidanga, Vrishana-sana; K - Vayuvilanga;
Mal - Vizhal; Tam - Vayuvilanga; Tel - Vayuvilanga.

Parts Used : Fruits.

Medicinal Uses

Ayurveda : Fruits carminative, antispasmodic, and taenifuge.
Antiseptic and anthelmintic.
Chemistry: Fruit contains embelin.

Uses as food: Used as an adulterant of black pepper.

43. **Emblica officinalis** Gaertn.

**Family**: EUPHORBIACEAE

**Synonym**: Phyllanthus emblica L.

**Botanical description**: A small or moderate sized deciduous tree, the branchlets and rhachises villous.

**Distribution**: The Deccan, the sea coast districts and Kashmir.

**Vernacular Names**

E - Emblic Myrobalan, Indian Gooseberry; S - Adiphala, dhatri, amalaka; H - Amla, amlika, aonla, anola; K - Amalaka, nelli; Mal - Nelli; Tam - Nelli; Tel - Amalakamu, usirikai.

**Parts Used**: Bark, leaves, flowers, fruits and seeds.

**Medicinal Uses**

Ayurveda: Fruit sour and astringent, cooling, diuretic, laxative, a rich source of Vitamin C, used for headache, diabetes, heart trouble, gastritis, anaemia, skin diseases, arthritis and asthma. Highly effective in curing ailments such as scurvy. A natural antacid, it acts as an antidote against hyperacidity. People suffering from chronic gastritis, peptic ailments and dyspepsia are given amla. Green fruit is exceedingly acid. Dried fruit is sour and astringent. Flowers are cooling and aperient. Bark is astringent. A decoction of the leaves is useful as a mouthwash in aphthae. Leaves are used as an infusion with fenugreek seeds in chronic dysentery. A mixture of the fruit juice and sugar relieves burning in the vagina. Used in all diseases where tissue degeneration is present.

Chemistry: Fruits, bark and leaves are rich in tannin, the content being 28%, 8-21% and 22% respectively.
44. *Fagonia cretica* L.

**Family** : ZYGOPHYLLACEAE  
**Synonyms** : *F. arabica* L., *F. bruguieri* DC.  
**Botanical description** : A small branched woody plant, the small pink flowers and globular capsules are immersed in copious thin straight spines.  
**Distribution** : Deccan, Punjab, Upper Gangetic Plain.  
**Vernacular Names**  
H - Damahan; S - Dusparsha; K - Mullumadugida; Tel - Chittigara.  
**Parts Used** : Whole plant.  
**Medicinal Uses**  
Ayurveda : Plant-bitter, astringent, tonic, febrifuge, prophylactic against small pox, in dropsy, delirium and any disorder which arises from poisoning. Leaves and twigs are used as refrigerant (Chopra et al., 1956).

45. *Feronia limonia* (L.) Swingle.

**Family** : RUTACEAE  
**Synonym** : *Feronia elephantum* (L.) Correa.  
**Botanical description** : Moderate sized prickly tree.  
**Distribution** : Indigenous in South India, cultivated in many parts of India.  
**Vernacular Names**  
E - Woodapple, Elephant apple; H - Kavitha, Kurbel; S - Kapittha; K - Beladamara, Dantasara; Mal - Vilav; Tam - Narivila; Tel - Velaga.  
**Parts Used** : Bark, leaves, fruit and pulp.
Ayurveda: Fruit is astringent, stomachic and stimulant. Leaves aromatic and carminative. Pulp is applied externally as a remedy for bites of venomous insects and reptiles. Bark prescribed for biliousness. Gum from the stem is demulcent. Pulp of ripe fruits is useful in salivation, sore throat and other affections of gums and throat, in hiccups, dyspepsia, biliousness. Unripe fruit is useful in diarrhoea and dysentery.

Chemistry: Leaves yield 0.73% essential oil. Leaves contain stigmasterol (0.02%) bergapten (0.10%); unripe fruit contains stigmasterol (0.015%); root bark contains ferulialactones. Bark contains marmesin (0.016%).

Uses as food: Fruit edible. Green fruit made into chutneys.

46. *Ficus benghalensis* L.

Family: MORACEAE

Botanical description: Tall, evergreen tree extending laterally by aerial roots. Leaves alternate, simple, coriaceous, orbicular-ovate, sub-cordate at the base, minutely pubescent, prominently nerved.

Distribution: Found all over India.

Vernacular Names

E - Banyan; H - Bor, Barh, Bargad, Nyagrodha; S - Vata; K - Aladamara; Mal - Ala, vatam; Tam - Pudavam, Alam; Tel - Peddamatti, Marri.

Parts Used: Bark, latex and leaves.

Medicinal Uses

a) Ayurveda: Milky juice is applied externally for pains in rheumatism and lumbago.

Bark astringent, infusion of bark, tonic and astringent, used in dysentery, diarrhoea, diabetes. Leaves and seeds cooling and tonic.
Leaves used as poultice to abscesses. Root fibres are used in gonorrhoea. Milky juice applied to the teeth and gums in ache.

Leaves are heated and applied as a poultice to abscesses and wounds to promote suppuration and discharge of pus. Infusion of small branches useful in haemoptysis.

Twigs forms a good toothbrush used to strengthen gums and teeth.

b) Homeopathy: The Banyan possess greater anti-haemorrhagic properties than *Ficus religiosa*.

Chemistry: Dried bark on extraction with 95% alcohol yields effective glycemic principle.

Uses as food: Fruits eaten in times of scarcity.

47. *Ficus carica* L.

Family : MORACEAE

Botanical description : Tree, small soft-wooded much branched and deciduous. Leaves thick, long-petioled, fruit pear shaped.

Distribution : Cultivated in many parts of North India.

Vernacular Names

E - Common fig; II - Anjir; S - Anjira; K - Anjura; M - Simayatti; Tam - Simaiyatti, tenatti; Tel - Anjur, manjimedi, simayatti.

Parts Used : Latex and fruits.

Medicinal Uses

Ayurveda : Fruits considered laxative, emollient and diuretic. Latex used as an anthelmintic.

Figs are wholesome, easy to digest and medicinally they remove gravel in kidneys and bladder, used to cure piles and in the treatment of gout.

Milky juice applied to cure ulcers in the mouth. Very efficacious in infantile liver problems.
Chemistry: Proteose, amino acid, tyrosin, enzyme cravin, lipase and protease. The fleshy receptacle contains grape sugar, gum, fat and salts. Dried figs contain sugar fat, pectose, gum, albumen and seeds. Milky juice contains a peptonising ferment whose effects on milk and fibrin are like those of papain.

Uses as food: Fruit is delicious with high nutritive value. Fruit is a source of Fig syrup. Also used in the preparation of Fig Wine and Brandy.


Family: APIACEAE (UMBELLIFERAE)

Botanical description: Herbaceous, cultivated for their leaves and seeds.

Distribution: Cultivated throughout India.

Vernacular Names

E - Fennel; H - Sonp, saunf; S - Madhurica; K - Badisopu; Mal - Sombu; Tam - Shombhu; Tel - Sopu, peddajilakarra.

Parts Used: Root, leaves and fruits.

Medicinal Uses

Ayurveda: Root is regarded as purgative. Leaves are diuretic and perspirant. Fruits carminative, aromatic, stimulant and useful in diseases of chest and kidney. Fruits are a constituent of liquorice powder and of preparations for allaying griping.

Hot infusion of the fruit is useful in amenorrhoea and in correcting lacteal secretion. Fruit oil is useful in flatulence and checks griping due to purgatives. Used in feverishness and indigestion with vomiting.

Chemistry: Fennel contains 20% proteins, pentosans, pectin, starch, volatile oil and fixed oil. The fixed oil contains 60% petroselenic acid. The volatile oil mainly contains anethole and traces of fenchone, methyl-chavicol, \( \alpha \)-pinene, \( \alpha \)-phellandrene, camphene and dipentene (Daniel, 1991).
Uses as food: Mericarps are used in soups, other dishes, sauces and pickles. Fruits are used as a flavouring agent in culinary preparations, confectionaries, cordials and liquers; mildly carminative.

Roman gladiators used to eat the fruits for courage before fights.

49. Glycyrrhiza glabra L.

Family : FABACEAE (= PAPILIONACEAE)

Botanical description : Small shrub

Distribution : Cultivated in Punjab, Andamans and East Himalayan tracts

Vernacular Names

E - Liquorice, licorice; H - Mulhatti, jethi-madh; S - Madhuka, yashti-madhu; K - Yashtimadhuka, atimadhura; Mal - Iratimadhuram; Tam - Atimaduram; Tel - Yashtimadhukam, atimadhramu

Parts used : Roots

Medicinal uses

Ayurveda : Roots tonic, expectorant, cooling, diuretic, emmenagogue, demulcent and laxative, used for allaying cough and catarrhal affections and irritable conditions of the membranes of the urinary organs. Root is used in scorpion-sting and used in all inflammatory condition of the respiratory system.

Chemistry : Principal constituent of liquorice to which it owes its characteristic sweet taste (60 times sweeter than cane sugar) is glycyrrhizin (2-14%), a saponin asparigin, sugars, starch, resin, gum and mucilage. Bark contains a small quantity of tannin.

Uses as food : Extract of roots used as a flavouring and sweetening agent. Also used in confectionery and for giving sparkle and aroma to beer. Liquorice is also chewed with betel leaves.
50. *Gmelina arborea* Roxb.

**Family** : VERBENACEAE

**Botanical description** : Unarmed tree, leaves orbicular-ovate.

**Distribution** : The lower Himalayas, the Nilgiris and the East and West coasts of India.

**Vernacular Names**

H - Gambhar, gumhar, sewan; S - Gambhari, kasmari; K - Shivani, kasmiri-mara; Mal - Kumbil; Tam - Kumadi, umi-thekkku; Tel - Gumartek, gummadi.

**Parts used** : Root, wood, leaves and fruits.

**Medicinal uses**

Ayurveda : Leaves demulcent, root an ingredient of 'Dasamula', an Ayurvedic preparation. Fruits are added to the cooling decoctions used in fevers and bilious affections. Stomachic, laxative and galactogogue. The drug is used in snake-bite and scorpion sting.

Chemistry : Root contains a yellow viscid oil, resin, an alkaloid, a trace of benzoic acid and manganese free ash. Fruit contains butyric and tartaric acids, an alkaloid, saccharin, resin and a trace of tannin.

51. *Gossypium herbaceum* L.

**Family** : MALVACEAE

**Synonyms** : *Gossypium obtusifolium* Roxb. (in part); *Gossypium wightianum* Tod.

**Botanical description** : Herbaceous annual, shrubby hairy plant.

**Distribution** : Widespread in tropical and subtropical West Africa. Cultivated in Maharashtra, Tamil Nadu, Andhra Pradesh and Karnataka.
Vernacular Names

E - Levant cotton; H - Rui; K - Hathi; Mal - Panji; Tam - Panji; Tel - Pathi.

Parts used: Root, leaves, husks, seed floss, seed kernels and seed oil.

Medicinal uses

Others: Seed oil is spermicidal in action, widely used by men in China (Farnsworth and Waller, 1982). A cold infusion of the leaves with lime juice is said to give relief in dysentery, the root is believed to be emmenagogic and oxytocic. The active principle is in the root bark. The leaves and crushed seed kernels are applied to sores or as a poultice to bruises and swellings and the lint is used for dressing wounds (Dalziel, 1937).

Chemistry: The kernel oil is composed of 47.8% linoleic acid, 23.4% palmitic acid and 22.9% oleic acid and small amounts of myristic acid, myristoleic acids and other fatty acids. The seeds contain a toxic polyphenol gossypol, which is destroyed by heating (thus rendering the oil suitable for consumption) (Aizikov and Kurmukov, 1973).

Gossypol has antiviral activity (Dorsett et al., 1975). The dimeric sesquiterpenes inhibit the growth of Aspergillus fumigatus (Stipanovic et al., 1975). Gossypol had antitherpetic action in infected mice on both oral and subcutaneous administration (Dorsett et al., 1975).

Gossypol is a lipid-soluble compound which has been shown to be eliminated from the body slowly but cumulative toxicity is a possibility (de Peyster and Wang, 1979).

Seeds and root bark are extracted for gossypol. Experimentally it was observed that gossypol causes cardiac irregularity in animals. Gossypol also is found to cause temporary male sterility in rats.

Uses as food: The seed oil is used for cooking.

52. Hedychium spicatum Buch.-Ham.

Family: ZINGIBERACEAE

Botanical description: Distichous herbs, with aromatic fleshy rhizomes.
Distribution: Distributed in subtropical Himalayas and Kumaon 5,000 - 7,000 ft.; cultivated in gardens.

Vernacular Names

E - Spiked ginger lily; H - Kapurakacharli; S - Karpurakachali, gandhashati; K - Gandhashati; Tam - Shimaikkichilly Kilhangu; Tel - Dumpa rastramu.

Parts used: Rhizomes

Medical uses

Ayurveda: Aromatic rhizomes are considered stomachic, carminative, stimulant, tonic, in dyspepsia, emmenagogue, vomiting, diarrhoea, inflammation and pains, used also in snake bite.

Chemistry: Essential oil, methyl paracumarin acetate, cinnamic ethyl acetate. Rhizomes yield 4% essential oil containing ethyl-p-methoxy cinnamate 67.8%, d-sabinene 4%, and sesquiterpene 4.7%.

53. Hibiscus mutabilis L.

Family: MALVACEAE

Botanical description: Large shrub, pubescent to tomentose

Distribution: Indigenous to China, frequently planted in tropical regions.

Vernacular Names

E - Chinese rose, changeable rose, changeable hibiscus, cotton rose, confederate rose; H - Shalapara, sthal kamal; S - Padmcharini; K - Bettada tavare; Mal - Chinapparatti; Tam - Irrataivellaichembarattam.

Parts used: Bark, leaves and flowers

Medicinal uses

Ayurveda: Leaves used for cough, menorrhagia, dysuria applied to swellings, wounds caused by burns and scalds. Flowers given in pectoral and pulmonary complaints. Plant is used as an emollient.
Chemistry: Flavonoids quercimeritrin, meratrin and cyanin were detected in flowers.

54. Holarrhena antidysenterica (L.) Wall.

Family: APOCYNACEAE

Synonym: Nerium antidysentricum L.

Botanical description: Large shrubs with white flowers.

Vernacular Names

H - Kura, kora; S - Kutaja, kalinga; K - Beppale; M - Kodagapala; T - Kodagapale; T - Kodaga.

Parts used: Bark, wood and leaves

Medicinal uses

Ayurveda: Leaf extract is used to cure dysentery. Bark is astringent, anthelmintic, stomachic, antipyretic, tonic and antidysenteric, used in amoebic dysentery and diarrhoea. Seeds are used for the same purpose as the bark. Seeds yield a fatty oil used as an anthelmintic. Although slow in action compared with emetine, it is less toxic and used as a substitute for emetine in amoebic dysentery.

Chemistry: Seeds contain alkaloids, conessine, kurchine, kurchicine. Alkaloids isolated from the bark are: conessine 0.4%; holarrhine, conarrhine, conamine, conessimine, conimine (0.04%).

Conessine, the principal alkaloid, possesses antitubercular activity in situ. It increases coronary outflow in the rabbit heart, induces narcosis in frog and produces local anaesthesia in guinea pigs but causes necrosis on subcutaneous injections. Kurchicine proved lethal to frogs, guinea pigs and mouse paralysing the central nervous system. The bark extract kills paramocia, colpidia and delphnia.
55. *Hordeum vulgare* L.

**Family**: POACEAE (GRAMINEAE)

**Botanical description**: Herbaceous, cereal and forage plant

**Distribution**: Temperate regions

**Vernacular Names**

E - Barley; H - Jau, jav; S - Yava; K - Jave godhi; Mal - Barley; Tam - Barliyarisi; Tel - Barlibiyyam, yavaku

**Parts used**: Grains

**Medicinal uses**

Ayurveda: Barley grains are used in the dietary of invalids and convalescents as it is easily assimilable. Barley water used as a diuretic and demulcent drink. Powdered grain much employed in the form of a gruel in cases of painful and atonic dyspepsia.

Chemistry: Presence of alkaloids, hordenine, gramine, others: amylase, vitamins of group B, glucides, protides and lipids.

Hypoglycaemic, reduces blood sugar level in fasting rabbits by 37.9% and in diabetic patients by 25%. Produces strong reduction in elimination of acetone and oxybutyric acid which occurs in diabetic patients; also used as an emollient.

Uses as food: Grains mainly used in the form of sattu, a cooling drink, also mixed with wheat and gram flour for making chapatis. Source of malt in the manufacture of beer.

56. *Juglans regia* L.

**Family**: JUGLANDACEAE

**Botanical description**: A deciduous monoecious tree

**Distribution**: Temperate Himalayas, 3,000-10,000 ft., cultivated in Kashmir, Himachal Pradesh and Uttar Pradesh
Vernacular Names

E - Walnut, Persian walnut, European Walnut; H - Akhrot; S - Akshota; K - Akhotubeja; Tam - Akrottu; Tel - Akrottu

Parts used : Bark, shell and seeds

Medicinal uses

a) Ayurveda : Bark is used for cleaning teeth and as an anthelmintic. Leaves are astringent, tonic, decoction used against strumous sores. Fruit is used as an alterative in rheumatism.

b) Homeopathy : In prominent skin eruptions.

Chemistry : A globulin, juglansin, isolated from the kernels; also contain vitamins B and A. The immature fruit is the richest source of ascorbic acid. Aqueous extracts of leaves, free of juglone, possess strong antimicrobial activity. Hydrojuglone, a glycoside found is in the Chinese drug. The leaves and the green pericarp of the unripened fruit have phytocidic properties (Chopra et al., 1969).

57. Macrotyloma uniflorum (Lam.) Verdc.

Family : FABACEAE (LEGUMINOSAE; PAPILIONACEAE)

Synonym : Dolichos biflorus L.

Botanical description : A trailing herb.

Distribution : Cultivated in Andhra Pradesh, Karnataka & Tamil Nadu as fodder crop.

Vernacular Names

E - Horsegram or Madras gram; H - Kulthi; S - Kultatha; K - Kurti-kalai, Hurali; Mal - Muthiva, muthera; Tam - Kollu; Tel - Ulavalu.

Parts Used : Leaves, stalks and seeds.

Medicinal Uses

Ayurveda : Seeds are diuretic, astringent, tonic. Decoction used in leucorrhoea and menstrual disorders.
A powder of the seed is applied to the skin to check cold sweats. It is a demulcent in calculus affections, coughs etc.

Chemistry: Seeds are a rich source of enzyme urease and strepogenin which is several times higher than in casein. Seeds contain β-sitosterol.

Uses as food: Seeds consumed after cooking or frying.

Taxonomic Notes: This species is to be correctly known as Macrotyloma uniflorum (Lam.) Verdc., but it is universally known as Dolichos biflorus L. The author of this latter binomial was Murray and not Linnaeus.

58. Mangifera indica L.

Family: ANACARDIACEAE

Botanical description: Moderate sized tree

Distribution: Extensively grown in Uttar Pradesh, Andhra Pradesh, Maharashtra and Tamil Nadu.

Vernacular Names:

E - Mango; H - Am, Amra; S - Amra; K - Mavinamara; Mal - Amram; Tam - Mamaram; Tel - Amramu, Mamidi.

Parts used: Bark, gum, leaves, flowers and fruit

Medicinal uses:

a) Ayurveda: Dried flowers astringent, given in diarrhoea, chronic dysentery, catarrh of the bladder and gleet. Bark is astringent, used in diphtheria and rheumatism. It has tonic action on the mucous membrane. Gum is used in dressings for cracked feet and for scabies; also considered antisyphilitic. Decoction of leaves, bark, gum, flowers, fruits and seeds used in medicine. Seed kernel astringent to taste, free from toxic principles. Kernel powder used as anthelmintic and in bleeding piles. Leaves used in scorpion-sting. Ripe fruit is used as laxative, diuretic, astringent. Rind of fruit is astringent, stimulant, tonic in debility of stomach.
Seeds used in asthma; kernel used in haemorrhage in diarrhoea, its juice if snuffed can stop nasal bleeding. Bark and kernel used in uterine haemorrhage, haemoptysis and melaena, diarrhoea and other discharges.

b) Homeopathy: One of the best general remedies for passive uterine, renal, gastric and intestinal haemorrhages and in relaxation of mucous membrane of the alimentary canal.

Chemistry: Flower yield 0.04% of an essential oil. Panicles give ethyl galate by alcohol extraction. Mangiferin has been isolated from the bark. Seed kernel contains amino acids and glycerides. Roots give mangiferin, friedelin and ϒ-sitosterol. Fruit contains Vit. A, C, D & B.

Extracts of leaves, bark, stems and unripe fruits exhibit moderate antibacterial activity against Micrococcus pyogenes var. aureus.

Used as food: Edible fruits. Mango kernel may be used for preparing products such as flour, starch, pickle and as cattle feed. Gum is used as a substitute for gum arabic.

59. Marsdenia tenacissima Wt. & Arn.

Family : ASCLEPIADACEAE
Botanical description : A stout climbing shrub
Distribution : Found in the Himalayas and Deccan Peninsula
Vernacular Names
E - Rajmahal hemp; H - Jiti, chiti, tongus; Tel - Karudushtupatige
Parts used : Roots, bark and seeds
Medicinal uses
Ayurveda : Roots constitute the drug white Turpeth (Safed Niscoth), used as a purgative. The root is used by Mundas as a remedy for colic.

Taxonomic Notes : According to some authors, Turpeth is obtained from the roots of Operculina turpethum (L.) Silva Manso., (Convolvulaceae).
60. Melia azedarach L.

Family : MELIACEAE

Botanical description : Tree. Leaves alternate, bipinnate, shining dark green.

Distribution : Cultivated and naturalised throughout India.

Vernacular Names

E - Pride of India, China tree, Persian Lilac, Bead tree; H - Bakain, Drek; S - Mahanimba; K - Huccubevu, Arebevu, hutchu bevu; Mal - Malveppu; Tam - Malayvembu; Tel - Vettiveppa, Turaka vepa

Parts used : Whole plant

Medicinal uses

Ayurveda : Root, bark, fruit, flowers and leaves deobstruent, resolvent, alexipharmic. Flowers and leaves applied as poultice to relieve headaches. Juice of leaves used internally as anthelmintic, diuretic, emmenagogue. Seeds prescribed in rheumatism. Oil is considered as similar to neem oil. Leaves and bark used internally and externally in leprosy and scrofula. Fruit used in leprosy and scrofula. Gum used in spleen enlargement and infusion of bark in ascariasis. Fruits used as tonic in cases of severe poisoning. The bark is antispasmodic and tonic.

Chemistry : Fruits contain a poisonous constituent, alkaloid azaridine, a resin, tannin, meliotannic acid and benzoic acid. Fruits yield bakayanin, sterol, a bitter principle margosine with antiperiodic properties and a fixed oil which contains sulphur. Contains bakalactone, a liquid product. Aqueous extract reduces intensity of asthmatic attack. Anthelmintic constituents of the cortex give vanillylic acid and d,l-catechin.

The aqueous extracts of fruits produce dyspnoea, tremor, convulsions and death in rabbits. The fruit extract can also cause paralysis in sheep, dogs and cats (Murthy and Sirc, 1957, 1958; Oliver-Bever, 1986). However, there is no toxic component in the Indian Melia azedarach (Ekong et al., 1968).

Botanical Notes : The name Melia azedarach L. a West Asian tree, commonly known as Persian Lilac, bakain, dharak or
chinaberry has been confused with *Melia azadirachta* L. The taxonomy of all these closely related species is so complex that some botanists have recognized as many as 15 species; others as few as two.

61. Mentha arvensis L.

Family: LAMIACEAE (LABIATAE)

Botanical description: A herb, with ovate, acute serrate leaves

Distribution: Western Himalayas, Punjab and Kumaon; cultivated.

Vernacular Names

E - Field mint, corn mint, marsh mint, H - Pudina; K - Chetni naragu; Mal - Pudina; Tam - Pudina; Tel - Pudina

Parts used: Leaves

Medicinal uses

Ayurveda: Stimulant, and carminative. Infusion of leaves used as a digestive and in rheumatism. Medicinally leaves are used as refrigerant, antiseptic, emmenagogue and diuretic.

Chemistry: Essential oil (0.82% yield) contains chiefly pulegone and d-isomenthone. Oil from plants grown in Kashmir yield a new source of linalool; leaves yield 0.2% essential oil containing d-carvone 80.8, carene 4.4, d-sylvestrene 3.8 and citronellol 6.2%.

Uses as food: The leaves and the essential oil are used in preparation of food, confectionery and masticatories, sometimes in place of peppermint oil.

62. Mesua ferrea L.

Family: CLUSIACEAE (GUTTIFERAE)

Botanical description: Trees
Distribution: Eastern Himalayas, evergreen rain forests of North Kanara and forests of Western Ghats and Andamans.

Vernacular Names

E - Mesua, Iron wood; H - Nagkesar, nagesar; S - Nagakeshara; K - Nagakesara, nagasampige; Mal - Nanga, peri, veluthapala, nagachempakam; Tam - Nagappu; Tel - Nagkesara, nagachampakamu, kesaramu

Parts used: Bark, wood, flowers and seeds

Medicinal uses

Ayurveda: Seeds yield a fatty oil used for skin troubles and as an embrocation in rheumatism. Bark with ginger used as sudorific.

Flowers astringent, stomachic, used in cough with expectoration, buds made into a paste with butter and sugar for use in bleeding piles, dysentery and burning sensation in feet. Unripe fruits aromatic, sudorific. Leaves and flowers in snake bite and scorpion sting.

Chemistry: Mesuol (1%) and mesuone. Kernel and shell oils are antibiotic. Flowers contain essential oil and two bitter substances. Petroleum ether extracts of the stamens gave beta-amyrin, beta-sitosterol and a new cyclohexadione compound named mesuaferrrol (Dennis et al., 1988).

The xanthones of Mesua ferrea (dehydro-cycloguanandin, calophyllin B, jacareubin, 6-deoxyjacareubin and mesuaxanthone) increase the depression of the CNS in rats. The xanthones did not show analgesic, antipyretic or anticonvulsant activities (Chaturvedi et al., 1974). The mast cell membrane and the prothrombin time remained unaffected by the xanthones (Gopalkrishnan et al., 1980).

Uses as food: Fruits are edible.

63. Mimosa himalayana Gamble

Family: MIMOSACEAE

Synonym: Mimosa rubicaulis Lam.

Botanical description: A large straggling prickly shrub.
Distribution: Most parts of India 300-1900 m. Commonly found on wastelands and ravines.

Vernacular Names
H - Shaiah-kanta; Mal - Kattusinikka; Tam - Ingai; Tel - Kodimudususu, undra, ventra

Parts used: Roots, wood and leaves

Medicinal uses
Ayurveda: Leaves in the form of infusion prescribed in piles, and prolapsed uterus. Brushed and applied to burns. Root powder given when the patient vomits food due to weakness (Chopra et al., 1956).

64. Mimusops elengi L.

Family: SAPOTACEAE

Botanical description: Medium evergreen trees

Distribution: Common in upper ghats, cultivated in the tropics.

Vernacular Names
E - Spanish-cherry, Bullet-wood; H - Mulsari, Maulsari; S - Sinhakesara; K - Ranje; Mal - Mukura; Tam - Mogidam, Magadam, Vakulam; Tel - Pogada

Parts used: Bark, leaves, flowers, fruit and seeds

Medicinal uses
Ayurveda: The bark is astringent, tonic and used in fevers. Leaves are used in snake bite. Pulp of the ripe fruit is astringent used in curing chronic dysentery. Seeds are broken and applied within the anus of children in cases of constipation (Chopra et al., 1956). Volatile oil distilled from flowers is a stimulant. Flowers and fruits are used as a lotion for wounds and ulcers. Powder of dried flowers produces copious discharge from the nose and is sniffed to
relieve headache. Unripe fruit is used as a masticatory to strengthen loose teeth. An infusion of the bark used as a gargle in diseases of gums and teeth (Nadkarni, 1954). Ripe fruits assists delivery. Bark prevents discharges from the mucous membranes of the bladder and urethra.

Chemistry: Seeds contain saponin (Chopra et al., 1956). The bark yields L-spinasterol, taraxerone, taraxerol and betulinic acid. Hentriacontane, B-carotene and lupeol were obtained from leaves, heartwood and roots. Quercitol, ursolic acid, a triterpene alcohol, quercetin and B-sitosterol were extracted from fruits and seeds (Rastogi and Mehrotra, 1990).

Diluted saponin from the seeds prepared in isotonic phosphate buffer showed spermicidal activity on human sperms (Bannerji et al. (1978a, 1979a,b; Oliver-Bever, 1986).

Uses as food: Ripe fruits are edible, used for preserves and pickles (Ambasta, 1986).


Family : SAPOTACEAE

Synonym : *Manilkara hexandra* (Roxb.) Dubard

Botanical description : Tree

Distribution : Cultivated throughout India

Vernacular Names

E - Milk tree; H - Khirni; S - Rajadani; K - Bakula; Mal - Palla; Tam - Palla; Tel - Manjipala, Pala

Parts used : Bark and seeds

Medicinal uses

Ayurveda : Bark is used in fevers and as a general tonic. Seed oil is demulcent and emollient. Bark is astringent, emollient and demulcent.

Chemistry : Seeds yield an edible oil (24.6%), known as Rayan oil with palmitic, stearic, lignoceric, oleic and linoleic acids. Bark contains tannin.

Uses as food : Ripe fruits eaten fresh or dried.

**Family** : MORINGACEAE

**Synonym** : *Moringa pterygosperma* Gaertn.

**Botanical description** : A tree with white flowers and long fruits.

**Distribution** : Native of India, wild in the sub-Himalayan range and cultivated throughout the tropics.

**Vernacular Names**

E - Drumstick; H - Segve; S - Murungi; K - Nugge; Mal - Murina; Tam - Murugai; Tel - Munaga

**Parts used** : Root bark, stem bark, gum, leaves, flowers, fruits and seeds

**Medicinal uses**

a) Ayurveda : Various parts of the plant (except the seeds) are considered as an aphrodisiac, antispasmodic, vermifuge, anti-inflammatory, cardiotonic, antiseptic, carminative, abortifacient and digestive; promote semen and improve the eye sight.

Used in diabetes, gout, enlargement of spleen and in epilepsy (Nadkarni, 1954).

b) Siddha : The bark is used as an emmenagogue.

c) Unani : Leaves used externally in laryngitis.

**Chemistry** : The root yields anthomine and pterygospermine. Root bark contain moriginine and spirochine.

The flowers and fruits contain alanine, glycine, arginine and aspartic acid.

Glycoside derivatives such as benzylisothiocyanate are obtained from seeds. Ben oil from seeds is rich in oleic and stearic acids.

Aqueous extracts of the root showed antifertility effect and prevent implantation in the uterus of rats.
The seed extract agglutinates pathogenic strains such as Candida albicans, *Shigella flexneri* and *Shigella dysenteriae* (Sharon A., Unpublished).

Spirochene has an antibiotic action Athomine is active against Cholera vibrios.

Uses as food: Root, leaves, flowers and fruits eaten as vegetables.


**Family**: RUTACEAE

**Botanical description**: Small deciduous tree.

**Distribution**: Cultivated in most districts, widely in the Deccan and the surrounding areas.

**Vernacular Names**

E - Indian curry leaf; H - Curry patta, mitha neem, Kathnim; S - Surabhininiba; K - Karivevu; Mal - Kariveppilu. Tam - Karuveppilei; karivempu; Tel - Karivepaku

**Parts used**: Root, bark and leaves

**Medicinal uses**

Ayurveda: The leaves, bark and root of the plant are used as tonic, stomachic, stimulant and carminative. The green tender leaves are used as a cure for dysentery and diarrhoea and for checking vomiting. The green tender leaves are used as a cure for dysentery. Juice of roots taken for relief from renal pain.

Chemistry: The leaf contains nearly 3% essential oil, generally extracted with saturated steam superheated to 220°C. The essential oil contains principally caryophyllene (26%), cadinene (18%), cadinol (13%), d-sabinene (9%), d-limonene (6%). The rest of its constituents dl-x-phellandrene, dipentene, iso-safrole, lauric and palmitic acids. The leaves also contain a crystalline bitter glucoside 'Koenigin' and a resin. The quality of essential oil is higher in tender leaves as compared to matured leaves.
Uses as food: The leaf is a common ingredient in Indian cooking and is noted for its flavour and pronounced odour.

68. *Myristica fragrans* Houtt.

**Family** : MYRISTICACEAE

**Botanical description** : Tall glabrous tree, fruit pyriform, enclosing a scarlet aril surrounding the nutmeg.

**Distribution** : Grown in Kerala, Nilgiris and Karnataka. In India it is found as a specimen tree in a few localities, chiefly botanic gardens.

**Vernacular Names**

E - Nutmeg tree; H - Jaiphal (fruit kernel), japatri (aril); S - Jatiphala; K - Jajikkay (fruit kernel), japatri (aril); Malay - Jatikka Tam - Jadikkay, jadipattiri; Tel - Jajikkay, japatri

**Parts used** : Kernel (nutmeg) and aril (mace)

**Medicinal uses**

Ayurveda: Nutmeg is considered a stimulant, carminative, astringent and aphrodisiac, used in tonics, electuaries and in vomiting, malaria, rheumatism, sciatica and early stages of leprosy. Excessive doses have narcotic effect with symptoms of delirium and epileptic convulsions. Oil from the dried kernels aperiodic, carminative. Nutmeg and mace are recommended for inflammation of the bladder and urinary passage. Nutmeg butter forms a useful application in cases of sprains and paralysis.

Chemistry: Oil of nutmeg varies from 6 to 16% according to the origin and quality of the spice. Nutmeg contains 38-43% of ether extractable matter from which is obtained 24-30% of the butter by cooking or steaming. Mace yields a fat similar to that from nutmeg. Leaves give essential oil (0.41-0.62%) and saponin. Dry ripe seeds contain 5 to 15% of a volatile oil and 25 to 40% of a fixed oil. Dry leaves yield 1.56% essential oil consisting of 80% $\alpha$-pinene and 10% myristicin. In addition, the oil contains elemicin and safrol (Gottlieb, 1979).
The essential oil extracted from the nut is an aromatic stimulant, at higher doses it is convulsant and contracts the uterus. The arils and seeds exhibit hallucinogenic properties (Truitt, 1967; Wiel, 1967). Large doses of myristicin causes physical collapse, nausea and congestion (Weiss, 1960).

Uses as food: Nutmeg and mace are used as a condiment. Pericarp used in pickles and jellies. Essential oil from leaves used in the preparation of chewing gums.

69. Nelumbo nucifera Gaertn.

Family : NELUMBONACEAE

Synonyms : Nelumbo speciosum Willd.; Nelumbo nelumbo Druce

Botanical description : Aquatic rhizomatous herb.

Distribution : Throughout the warmer parts of India

Vernacular Names

E - East-Indian lotus, sacred lotus, Chinese water lily; H - Kamal, Kanural; S - Ambuja, padma, pankaja, kamala; K - Kamala, tavaregadde; Mal - Thamara, senthamara. Tam - Ambal, thamarai; Tel - Kalung, erra-tamara

Parts used : Rhizomes, flowers, torus and seeds

Medicinal uses

a) Ayurveda : Paste obtained from seeds is used to cure skin diseases. Extract of rhizome used as a cardiac tonic. Rhizomes yield a kind of arrow root which is given in dysentery and diarrhoea. Root and carpels demulcent.

Flowers are cooling, used as astringent in diarrhoea, cholera, fever, diseases of the liver and as a cardiac tonic.

Seeds are used to check vomiting, given to children as diuretic and refrigerant. Forms a cooling medicine for skin diseases and considered an antidote to poisons.
Filaments are considered astringent and cooling useful in burning sensation of the body, bleeding piles and menorrhagia.

Petals pounded and administered for syphilis. They are given to remove 'kapha' and 'pitta'. Sedative to the uterus, good in thirst, piles, inflammation and poisoning.

Root powder as a paste used in skin affections and ringworm.

b) Others: Embryo (called 'mekula') used to reduce high fever and in the treatment of cholera, haemoptysis and spermatorrhoea in China and Malaya.

Chemistry: Petioles, pedicels and embryos contain an alkaloid, nelumbine, which acts as a cardiac poison. Alkaloid nupharine in 8 mg/kg dose to a dog caused lasting restoration and stimulation of respiration. Leaves yield the alkaloids nuciferine, roemerine and normuciferine. Fresh leaves on extraction yield nelumboside 0.1% which is quercitin 3-glucoglucuronide.

The rhizomes produced narcosis which led to somnolence in mice, dogs and eels (Delphaut and Balansard, 1941).

Uses as food: Raw seeds eaten as food during famine. Rhizomes, seeds and young leaves are eaten as vegetable. Fruiting torus (Kamal-gatta, kaul chapam) contains round or oblong carpels which are eaten after removing the outer covering and intensively bitter embryo. Carpels are sweet and eaten raw, roasted, boiled, candied or ground into flour considered more nutritive than cereals.

70. Neolitsea cassia (L.) Koster.

Family : LAURACEAE

Synonym : Neolitsea zeylanica (Nees) Merrill.


Distribution : Melekote, N. Bengal and Western Ghats
Vernacular Names

K - Bilinisangi, massimara; Mal - Vayana; Tam - Molaga shembagapalei; Tel - Aku pattrikamu.

Parts Used : Roots, bark, wood, leaves and kernels.

Medicinal Uses

Ayurveda : Roots and bark are applied to eruptions and bruises.

Chemistry : Sesquiterpenes such as zeylanine, zeylanicline, zeylanidine, linderalactone, linderane and neolinderane were isolated from the roots (Rastogi and Mehrotra, 1990).

Uses as food : Leaves used as an adulterant of cinnamon.

71. Nigella sativa L.

Family : RANUNCULACEAE
Synonym : Nigella indica Roxb. ex Flem.

Botanical description : Herb, 30-60cm. high with pinnatisect leaves.

Distribution : Cultivated in Punjab, Bengal, Assam and Bihar.

Vernacular Names

E - Black cummin, Nutmeg flower; H - Kalajira; S - Kalajaji; K - Karejirage; Mal - Karushiragam; Tam - Karunjiragam; Tel - Nallajeelakarra.

Parts used : Herb, seeds

Medicinal Uses

a) Ayurveda : The herb is bitter, aromatic, appetite, stimulant, used as an emmenagogue, carminative, anthelmintic and as an adjunct to purgative remedies (Nadkarni, 1954).

Sushrutha recommended the seeds in combination with other drugs for treating snake-bites and scorpion sting; seeds alone were not antivenomous (Nadkarni, 1954).
b) Unani : The herb is slightly bitter, with a sharp taste, used in ascites, as a diuretic, emmenagogue and abortifacient. It finds its use in bronchial complaints and jaundice. Used also in hydrophobia, in paralysis and for the sore-eye. It forms a good adjunct in remedies for piles.

72. *Nymphaea alba* L.

**Family** : NYMPHAEACEAE

**Botanical description** : A perennial aquatic herb.

**Distribution** : Found in the lakes of Kashmir, a native of Europe and North Africa.

**Vernacular Names**

E - European white water lily; H - Pandharenkamal; S - Kumuda; K - Bilitavare; Tel - Tella tamara

**Parts used** : Root and flower

**Medicinal uses**

*Ayurveda* : Demulcent, used in diarrhoea (Nadkarni, 1954). Root and stock used as an astringent, slightly narcotic, administered in dysentery. Flowers anti-aphrodisiac. Infusion of flower and fruit given in diarrhoea and as diaphoretic. Rhizome decoction given in diarrhoea. Rhizomes act as a sedative and an antispasmodic to counteract convulsions induced by strychnine (Delphaut and Balansard, 1943).

*Chemistry* : Dried roots yield alkaloid nupharine and nymphaeine; toxic with affinity for nervous system. Root contains alkaloid nymphaeine and several astringent principles. Flowers contain cardiac glucoside nymphalin. Blossoms contain alkaloid similar to nupharine.

Delphaut and Balansard (1941) studied 'nupharine' from *Nymphaea alba* L. a non-African species which is found to consist of nelombine, nupharidine, nymphaeine and L-nupharidine.

Nupharine administered to frogs, mice, rats, guinea pigs and pigeons produce paralysis of the cerebrum, causes death by
respiratory arrest. Flowers and rhizomes yield two alkaloids both showing sedative action in small doses. Minimum effective and lethal doses of nymphaein for frogs 30 and 50 mg/kg, for mice and pigeon 60 and 80 mg/kg; warm blooded animals die from central respiratory paralysis (Chopra et al., 1956). Alcoholic extracts of rhizomes, containing the alkaloid nymphaeine, have a mild sedative and spasmytotic action, but in large doses shows paralysing action on medulla (Ambasta, 1986).

Uses as food: Boiled rhizomes and parched seeds eaten in times of scarcity.

73. Nymphaea rubra Roxb. ex Salisb.

Family : NYMPHAEACEAE


Distribution : Throughout India in the warmer parts

Vernacular Names

E - Indian red water lily; H - Kanval, Koka, Kof, Bhenght; S - Kumuda; K - Nyadale huvu; Mal - Periambal, neerambal, ampala. Tam - Allitamarai, Vellambal; Tel - Allitamara, erra-kalava

Parts used : All parts

Medicinal uses

a) Ayurveda : Rhizome is considered demulcent and used for dysentery and dyspepsia. Flowers are astringent and cardiotonic. Seeds are used as a cooling medicine in cutaneous diseases. Flowers are cardiotonic. Powdered rootstock given in piles.
b) Others: In northern Nigeria (the Hausas) tribe use seeds in eruptive fevers. In Sierra Leone, an eye lotion is prepared from the leaves, decoction of the flowers used as a narcotic, sedative and an infusion of stems and roots act as an emollient and diuretic. A decoction of Nymphaea is taken for coughs and bronchitis in the Ivory Coast (Oliver, 1960).

Uses as food: All parts of the plant are eaten. Starchy rhizomes eaten raw or boiled, sometimes baked. Flowering stalks used in salads and stems, unripe fruits as vegetable. Flowers used for the preparation of Ghillard and Gulkand.

74. **Nymphaea stellata Willd.**

Family : NYMPHAEACEAE

Synonym : *Nymphaea lotus* L.

Botanical description : A large perennial aquatic herb.

Distribution : Found in ponds and ditches throughout India.

Vernacular Names

E - Indian blue water lily, Egyptian lotus, Foxnut; H - Nilpadma, Nilkamal; S - Nilopala; K - Niltavare; Mal - Sitambel; Tam - Karu neythal, Nilotpalam; Tel - Nallakalava, Nitikalava, Kalava puvvu

Parts used : All parts

Medicinal uses

Ayurveda : The powdered rhizome is given in dyspepsia, diarrhoea and piles. An infusion of rhizomes and stems is considered emollient and diuretic; it is used for blennorrhagia, gonorrhoea and diseases of the urinary tract. Macerated leaves used as a lotion in eruptive fevers. Seeds stomachic and restorative. Decoction of flowers narcotic; prescribed in palpitation of heart.

Uses as food : Rhizomes, tender leaves and flower peduncles are used as vegetable. Seeds eaten in times of scarcity, they are made into flour which is mixed with wheat or barley flour.
75. *Oroxyllum indicum* Vent.

**Family** : BIGNONIACEAE

**Synonyms** : *Bignonia indica* L., *Calosanthes indica* Blume

**Botanical description** : A small tree with compound leaves and large flat fruits, branched at the top.

**Distribution** : Distributed throughout the greater part of India.

**Vernacular Names**

H - Arlu; sauma; S - Shyonaka, aralu; K - Tigdu, bunepale, sonepatta; Mal - Palagapaiyani; Tam - Achi, peiarlanthei; Tel - Dundilum, pampini.

**Parts used** : Root, root bark, stem, stem bark, leaves, fruits and seeds.

**Medicinal uses**

Ayurveda : Root-bark a tonic, stomachic, anodyne, sudorific and astringent used in diarrhoea and dysentery; also as a diaphoretic and in rheumatism. Boiled in oil, it is used in otorrhoea. Root is used in dropsy and as vulnerary. Leaves are used as an emollient and externally for enlarged spleen, headaches and ulcers. Stem is used in scorpion stings. Tender fruits are refreshing and stomachic; seeds purgative. Decoction of leaves is given in stomach ache and rheumatism. Plant is credited with antiseptic properties.

Powdered bark along with turmeric used as a poultice for sore backs of horses. Infusion of the bark useful in rheumatism.

Chemistry : The bark and seeds yielded a crystalline bitter substance oroxylin and baicalein isolated from the bark (Chopra et al., 1956). The leaves of *Oroxyllum* yield saponins, tannins and quinones (Gibbs, 1974).

The bark extract decreased capillary permeability in rats sensitised by egg albumin. The extract suppressed inflammation caused by egg albumin in intact and adrenal ectomised rats (Rastogi & Mehrotra, 1990). The root bark extract was found to be bactericidal in vitro against...
Salmonella typhi, Salmonella paratyphi A, Salmonella paratyphi B, Shigella, Pseudomonas and Vibrio but showed no action against Klebsiella and some strains of E. coli (Sundar et al., 1991).

Uses as food: Young shoot and unripe fruits eaten as a vegetable; flowers and bark are edible. The thin light seeds are eaten.

76. Oryza sativa L.

Family : POACEAE (GRAMINEAE)

Botanical description : Cultivated marshy grass. Stem smooth, hard straw green. Leaves coriaceous, linear, acuminate, margin spinulose; sheath glabrous; ligule with a fringe of hairs.

Distribution : Grown all over India as a food crop.

Vernacular Names

E - Rice, paddy; H - Chawal, Dhan; S - Dhanya, vrihi, nivara; K - Nellu, batta, akki; Mal - Nellu, ari; Tam - Nellu, arisi; Tel - Vadlu, varidhanyam, biyyamu

Parts used : Rice straw, bran and endosperm

Medicinal uses

Ayurveda : Rice gruel in disorganised digestion; in bowel complaints, in diarrhoea and dysentery. Rice water is demulcent, refrigerant, soothing nourishing drink in febrile diseases and inflammatory states of intestines.

Chemistry : Alkaloid oridine (antineuritic when impure) silver skin contains oryzyanin, a base; bran gave a glucoside nukain which on hydrolysis yielded the aglucone nukagenin (Chopra et al., 1956). The main constituent of rice is starch but the embryo contains 10-20% lipids. The lipid fraction contains sterols and tocopherols. Rice oil is used in treating sterility in women. A steroid, oestrone (Farnsworth et al., 1975 b) found in Oryza sativa induces ovulation (Heftman, 1967; Paris and Moyse, 1967).

Rice seeds contain a 2-acetamido-2-deoxy-D-glucose specific lectin. Rice lectin agglutinates rabbit, rat, hamster,
guinea pig and monkey erythrocytes. It is non-specific in agglutinating the A, B, AB and O groups in humans. Normal and transformed human leukocytes and He La cells were agglutinated by rice lectin (Poola, 1982; Poola et al., 1986). The lectin binds to the bacteria found in the rhizosphere of rice (Tabary et al., 1984). Both Poola et al., (1986) and Tabary (1987) observed that rice lectin stimulated the incorporation of tritiated thymidine by peripheral lymphocytes in humans, although neither the lymphocyte proliferated nor there was blast formation.

Uses as food: Staple diet of the third world's population. Rice bran oil is used as a cooking medium.

Special mention: One of the oldest food crops; impressions of paddy on clay lumps and remnants of husk as far back as 2,300 B.C. have been found.

77. Pavonia odorata Willd.

Family : MALVACEAE

Botanical description : Erect, odorous hairy herb.

Distribution : Commonly found in semi-arid regions in the eastern plains.

Vernacular Names

H - Sugandhabala; S - Bala; K - Balarakkasi, peramutiberu; Mal - Kuruntotti; Tam - Peramutti, avibattam; Tel - Ettakuti

Parts used : Root

Medicinal uses

Ayurveda : Root - astringent, tonic, prescribed in intestinal haemorrhage and dysentery, demulcent, carminative, febrifuge, antipyretic, stomachic and refrigerant. Plant used as a cure for rheumatism.

Chemistry : Essential oil from roots is unpleasant to smell and has an yield of 0.5%.
78. Phoenix dactylifera L.

Family : ARECACEAE (PALMAE)
Synonym : Phoenix sylvestris Roxb.

Botanical description : Trunk stout, covered with persistent leaf base and topped by a crown of large feathery pinnate leaves.

Distribution : Distributed in India, over the hills of Himachal Pradesh, grows on rocky slopes.

Vernacular Names

E - Date palm, wild date; H - Khajur; S - Kharjura, kharjur; K - Kharjura; Mal - Ittappazham, tenitta; Tam - Perichchankay, karchuram; Tel - Kharjuramu

Parts used : Sap, leaves, fruits and seeds.

Medicinal uses

Ayurveda : Dates are demulcent, expectorant and laxative; also used in respiratory diseases and fever. Sap is sweet, nutritive and laxative. Tree yields a gum used in diarrhoea. Pollen exhibit gonadotrophic activity in rats (El Ridi, 1960) an oestrogenic substance is isolated from the fatty oil of dried pollen and kernels (Hassan and El Waffa, 1947; Heftman, 1967; Paris and Moyse, 1967).

Uses as food : Dates are rich in sugars and eaten fresh and dried; also used in bakery, confectionery, jams and preserves. Brandy of good quality is prepared from dates. Seeds (stones) when ground or softened by soaking in water are used for feeding camels, goats and horses and have been successfully substituted as a poultry feed. Sap is used for the preparation of jaggery and sugar. Terminal leaf-bud consumed as vegetable.

79. Picrorhiza kurrooa Royle ex Benth.

Family : SCROPHULARIACEAE

Synonym : Picrorhiza scrophulariflora Pennell; Picrorhiza kurrooa Hook. f., in part, non Royle ex Benth.
Botanical description: Flowers pale blue-purple, in a dense cylindrical head, corolla small (Pollunin and Stainton, 1984).

Distribution: Distributed on rocky slopes from Pakistan to Uttar Pradesh 3300-4300 m.

Vernacular Names
S - Katuka, katuropini; H - Kuru, kutki; Mal - Katukarogani; Tam - Katukarogani; Tel - Katukarogani

Parts used: Dried rhizomes and roots

Medicinal uses
Ayurveda: Dried rhizomes and roots constitute the drug picrorhizin, considered to be a bitter tonic, also cholangogue and stomachic; laxative in small doses but cathartic in large doses; effective in dropsy and diseases where constipation is predominant.

Chemistry: The rhizomes contain picrorhizin, its bitter principle as glucosidovanilloyl glucose, extraction of kurrim, a water-soluble crystalline compound identified as D-mannitol and kutkin.

80. Pimpinella anisum L.

Family: APIACEAE (UMBELLIFERAE)

Botanical description: Herbaceous annual, pubescent, leaves pinnately decompound

Distribution: Cultivated in North Western India

Vernacular Names
E - Spanish aniseed oil; Anise, aniseed; H - Saonf, sawonf, badian; S - Shetapushpa; K - Shombu; Mal - Shombu; Tam - Shombu; Tel - Kuppi, sopu

Parts used: Fruits

Medicinal uses
Ayurveda: Fruit diuretic, carminative, used to prevent flatulence and colic; expectorant, stimulant, diaphoretic,
used in the preparation of asthma powders and in veterinary medicine.

Chemistry: Seeds contain an essential oil, 90% of which is anethole and the rest being p-methoxy-phenyl acetone and chavicol.


Family : PINACEAE  
Synonym : *Pinus roxburghii* Sarg.  
Botanical description : A gregariously large tree with deeply fissured bark.  
Distribution : Grows extensively from Afghanistan to Bhutan at 1000-2000 m.

Vernacular Names  
E - Chir pine, Himalayan long-leaved pine; H - Chir, chil, sarala; S - Sarala; K - Sarala, thailaparni; Mal - Saralam; Tam - Simaidevadari; Tel - Sarala  
Parts used : Oleoresin, twigs, needles and cones  
Medicinal uses  
Ayurveda : Oleoresin is an expectorant, useful in chronic bronchitis and especially recommended for gangrene of lungs. Given as a carminative in flatulent colic and also used to arrest minor haemorrhages in tooth sockets and nose. Externally used as a rubefacient in rheumatic affections and for deep-seated inflammations, especially of abdomen.  
Uses as food : Seeds are edible.

82. *Piper cubeba* L. f.

Family : PIPERACEAE  
Synonym : *Cubeba officinalis* Raf.  
Botanical description : A woody climber, flowers unisexual
Distribution: Cultivated mainly in Karnataka

Vernacular Names

E - Cubebs, tailed pepper; H - Kababchini, Sitalachini; S - Sungadha-muricha; K - Bala menasu; Mal - Valmilaku; Tam - Valmilaku; Tel - Chalava-miriyalu, tokamiriyalu

Parts used: Fruits

Medicinal uses

a) Ayurveda: Fruits used in dysentery and as an aromatic stimulant, local irritant, diuretic, carminative and sedative. They are used in rheumatism, gonorrhoea, and bronchial troubles.

b) Homeopathy: Aimed chiefly at mucous membranes, especially of the urinary tract, affected by frequent urination of a nervous origin.

Uses as food: Oil of cubebs, used in lozenges and for flavouring bitters and cigarettes and as a condiment.

83. **Piper longum** L.

Family: PIPERACEAE

Botanical description: A slender undershrub, with subscandent branches.

Distribution: Native of India and cultivated in Western Ghats, Karnataka and Tamil Nadu.

Vernacular Names

E - Indian long pepper; H - Pipal, pipli, pliplamul (root); S - Pippali; K - Hippali, tippali; Mal - Tippali, pippali magadhi; Tam - Tippili, pippili, sirumulam, vettilai (root); Tel - Pippallu

Parts used: Roots and fruits

Medicinal uses

Ayurveda: Roots (Pipplamool) and fruits used for diseases of the respiratory tract; as counter-irritant and analgesic
for muscular pains and inflammation; as snuff in coma and drowsiness; internally as carminative; as sedative in insomnia and epilepsy; as cholagogue in obstructions of bile duct and gall-bladder; as an emmenagogue and abortifacient.

Uses as food: Fruits used as a spice, in preserves and pickles.

84. *Piper nigrum* L.

**Family**: PIPERACEAE

**Botanical description**: A stout glabrous climbing shrub, leaves cordate

**Distribution**: Cultivated in Western Ghats, Karnataka, Tamil Nadu, Kerala and Maharashtra.

**Vernacular Names**

E - Black pepper; H - Kali mirch, Gol mirch; S - Maricha; K - Kare menasu; Mal - Kurumulaku; Tam - Milagu; Tel - Miriyalu

**Parts used**: Fruits

**Medicinal uses**

a) **Ayurveda**: Fruits used as stimulant, carminative and stomachic.

b) **Homeopathy**: Used in gastric discomfort, thirst, cramps and tympanites. Used also in dyspnoea, palpitation and difficult micturition.

**Chemistry**: Seeds contain an essential oil which is fungicidal (Chaurasia and Kher, 1978; Raina et al., 1976). Fruits aromatic with a biting pungent taste due to the presence of an oleoresin. Piperine is the major constituent causing pungency. The plant contains cyanogenic glycosides, saponins, tannins and terpenoids. Debrauwere and Verzele (1975) identified the largest number of oxygenated compounds, aliphatic acids, esters, carbonyls, aromatic ethers and new esters and terpenes in pepper. The monoterpene and sesquiterpenes forming 89% of the volatile oil were found to have a turpentine smell (Govindarajan and Narasimhan, 1989).
Uses as food: Fruits used as spice and condiment. Green fruits are pickled. Peppers retard rancidity in oils and fats, frozen ground pork, beef and lard. Pepper oil is used as an adjunct in the flavouring of sausages, canned meats, soups, table sauces and certain beverages and liqueurs. Pepper hulls are used for flavouring tinned food and for extraction of pepper oil.

85. *Pistacia integerrima* Stewart ex Brandis.

Family : PISTACIACEAE

Synonym : *Pistacia chinensis* Bunge var. *Integerrima* Zohary.

Botanical description : A medium sized tree with short trunk

Distribution : Himalayan mountain ranges on the north-west from Kashmir to Simla; cultivated by river sides.

Vernacular Names

E - Chian turpentine tree; H - Kakra singi; S - Karkata shringi; K - Dustapachatva, karkata ashrunji; Mal - Kakkata shringi Tam - Kakata shingi; Tel - Kakarashingi

Parts used : Wood, large crooked dull red galls on leaves

Medicinal uses

Ayurveda : Galls on the leaves employed in asthma, phthisis, and other diseases of the respiratory tract and for dysentery. Galls contain an essential oil used as a carminative.

86. *Plumbago zeylanica* L.

Family : PLUMBAGINACEAE

Botanical description : Scandent shrub with white flowers
**Distribution**: Common straggler in open forest and in waste places, cultivated throughout India.

**Vernacular Names**

E - Ceylon leadwort; H - Chita, chitarak, chitra; S - Chitraka; K - Chitramula, vahni, bilicitramula; Mal - Tumba koduveli, vellakoduveli; Tam - Cithiramulam; Tel - Agnimata, chitramoolam

**Parts used**: Root and leaves

**Medicinal uses**

a) **Ayurveda**: Root abortifacient, vesicant; used in dyspepsia, piles, anasarca, diarrhoea and skin diseases. Paste of the root applied for opening abscesses. Infusion of roots used in influenza and black water fever.

b) **Homeopathy**: This is an anti-psoric of great power. Aids absorption of cicatricial tissue and induration of tissue. Used in the cancer of pylorus and duodenal ulcer.

c) **Others**: Plumbago leaves are mixed with soup as a remedy for fever and as an anthelmintic in Nigeria. The root is used as an enema to treat piles (Dalziel, 1937). Leprosy is treated by using the leaves in the Ivory Coast and Volta (Kerharo and Bouquet, 1950).

**Chemistry**: The roots contain two quinones, plumbagin and plumbagol; the leaves and stems have very small amounts of volatile oil (Watt and Breyer-Brandwijk, 1962).

Plumbagin is said to stimulate secretion of sweat, urine and bile; it acts as stimulant of the CNS and on muscles (Bhatia and Lal, 1933). Plumbagin was found effective against Staphylococci and some pathogenic fungi (Coccidioides imminenitis, Histoplasma capsulatum, Trichophyton furaseum (Carrara and Lorenzin, 1946; Van der Vijver and Lotter, 1971). In vitro, plumbagin can inhibit growth of Staphylococcus aureus, Streptococcus pyogenes, Pneumococcus, Escherichia coli and Salmonella (Skinner, 1955; Oliver, 1960; Wichkanova et al., 1973b). The whole plant including the roots contains plumbagin (2-methyl-4-hydroxy-1,4-naphthoquinone) which shows abortive properties in vitro but not in vivo (Bhatia and Lal (1933); Ko (1933); Premakumari et al. (1977); Bingel and Farnsworth (1980); Santhakumari and Sujantham (1980).
87. *Pongamia glabra* Vent.

**Family**
: FABACEAE (PAPILIONACEAE)

**Synonym**
: *Pongamia pinnata* Pierre.

**Botanical description**
: A moderate sized evergreen tree, leaves alternate, imparipinnate

**Distribution**
: Commonly found in West Bengal and South India

**Vernacular Names**

E - Pongam oil tree, karanj, Indian beech; H - Karanja; S - Karanj; K - Honge; Mal - Pungu, punnu; Tam - Ponga, pongam; Tel - Kanuga, pungu

**Parts used**
: Roots, bark, leaves, flowers, fruits, seeds and oil from seeds

**Medicinal uses**

Ayurveda : Pongamia oil from seeds is applied in scabies, herpes, leucoderma, and other cutaneous diseases. Internally it is used in dyspepsia with sluggish liver. Juice of leaves prescribed in flatulence, dyspepsia, diarrhoea and cough; also used in leprosy and gonorrhoea. Juice of roots used for cleansing foul ulcers, fistulous sores, cleaning teeth and strengthening gums. Fresh bark given in piles. Decoction of bark used in beri-beri.

Chemistry : Karanjin is the active principle. Bark contains a bitter alkaloid, resin, mucilage and sugar but no tannin. The furolavones keranjin, pongapin, pinnatin and gamatin were isolated from the roots and pongapin from seeds and waxes of the stem bark (Chopra et al., 1969).

The aqueous extract of the stem bark exhibited significant CNS sedative and antipyretic effects in experimental animals. There was no effect on cardiovascular system, though it showed antispasmodic effects on smooth muscle (*in vitro*) (Pillai and Vijayamma, 1988).
88. *Portulaca oleracea* L.

Family : PORTULACACEAE

Synonym : Portulaca sativa Haw

Botanical description : A prostrate succulent herb

Distribution : All over India, particularly in dry districts

Vernacular Names

E - Common purslane; H - Khursa, baralaniya, kulfa; S - Brihalloni, lonika, lonamla; K - Dooddagoonf soppu; Mal - Karicheera; Tam - Karikeera, paruppukiray, pullikirai; Tel - Peddapayilikura, ganga-pavilikura

Parts used : Herb

Medicinal uses

Ayurveda : Herb is refrigerant, alterative, useful as an article of diet in scurvy and liver disease. Seeds are vermifuge. Juice of stems applied to prickly heat and to the hands and feet when a burning sensation is felt.

89. *Portulaca quadrifida* L.

Family : PORTULACACEAE

Synonym : Portulaca meridiana L.

Botanical description : Succulent herb, leaves lanceolate

Distribution : Throughout the warmer parts of India.

Vernacular Names

H - Chotaluniya; S - Upadyki; K - Hali bachchele, gonnisoppu; Tam - Passalaikkirai; Tel - Goddupavili

Parts used : Leaves and seeds
Medicinal uses

Ayurveda: Fresh leaves bruised and used as external application in erysipelas; an infusion used as a diuretic in dysuria. Seeds considered vermifuge.

90. Prunus cerasoides D. Don

Family: ROSACEAE

Synonym: Prunus puddum Roxb. ex Brandis, non Miq.

Botanical description: A moderate sized tree with smooth bark

Distribution: Commonly found between Himachal Pradesh and South West China; often planted.

Vernacular Names

E - Himalayan wild cherry; H - Paddam, phaya; S - Padmaka

Parts used: Bark, fruit and kernel

Medicinal uses

Ayurveda: Kernels yield an oil similar to that of bitter almonds, and used for stone and gravel.

Uses as food: Fruits are edible and used in the preparation of brandy.

91. Prunus cerasus L.

Family: ROSACEAE

Botanical description: Small round-headed bushy-topped tree, with grey tight bark. Fruits globular and red.

Distribution: Native of Eurasia, cultivated in Kashmir, Himachal Pradesh and Kumaon
Vernacular Names
E - Red cherry, sour cherry, dwarf cherry; H - Alubalu, gilas
Parts used : Bark, leaves, fruit, fruit stalks and kernel
Medicinal uses
Ayurveda : Bark bitter, astringent, febrifuge. Kernel used in nerve tonics and used for same purpose as hydrocyanic acid. Bark used for allaying heart palpitation; also used in diarrhoea. Infusions of leaves given to children to cure convulsions. Fruit stalks are diuretic and pectoral.
Uses as food : Large quantities used for canning and cooking; too acidic as a table fruit. Cherry juice and syrup are used as vehicles for administering salty and bitter drugs and for masking iron preparations. Sour cherries also used in the preparation of liquors. Kernels used as a salad and to obtain culinary oil.

92. Psoralea corylifolia L.

Family : PAPILIONACEAE (FABACEAE)
Botanical description : Erect sparsely hairy herb. Leaves are warded (psorelos)
Distribution : Throughout India.

Vernacular Names
E - Babchi; H - Babchi, bavanchi, bukchi; S - Bakuchi, kushthanashini, sugandhakantak; K - Bavanchigida, karbekhiga; Mal - Karpokkari, kaurkoalari; Tam - Kaarboka arisi, karporgam; Tel - Baavanchalu, bapunga, bawuchee
Parts used : Fruits and seeds
Medicinal uses
Ayurveda : Fruits and seeds are laxative, diuretic, diaphoretic and aphrodisiac. Specially recommended for leucoderma, leprosy, psoriasis and inflammatory diseases of the skin; used both internally and externally as a paste. Trials have shown that seeds are useful in the treatment of leucoderma of non-syphilitic origin.
Chemistry: Psoralen and iso-psoralen are the active principles. Seeds contain a fixed oil and an essential oil.

93. *Punica granatum* L.

Family : PUNICACEAE

Botanical description : A large shrub or a small tree

Distribution : Cultivated in warm parts of India

Vernacular Names

E - Pomegranate; H - Anar, dalim; S - Dadima; K - Dalimbay; Mål - Matalam; Tam - Madulai; Tel - Danimma

Parts used : Root-bark, dried stem bark, leaf, flowers, unripe and ripe fruit, rind, pulp and seeds

Medicinal uses

Ayurveda: The rind of the fruit is an astringent, digestive, cardiotonic, stomachic and is very effective in chronic diarrhoea and dysentery, dyspepsia, colitis, piles and uterine disorders.

Seeds of rotten fruit used in scorpion sting.

The root bark and stem bark are vermicides.

Chemistry: Bark contains alkaloids pelletierine, isopelletierine, tannates and trieldin.

The flowers contain a pigment, pelargonidin 3,5-diglucoside.

Leaves of the young plant contains piperideine. Root may contain inulin.

The rind of *Punica granatum* was shown to have antifertility effects. The seed oil was found to inhibit *Salmonella typhosa*, *Salmonella paratyphi*, *Shigella flexneri* and *Klebsiella pneumoniae* (Chopra et al., 1969).

The extracts of the rind, flowers, leaves and stem bark exhibits antibacterial activity.
Uses as food: Fruit is edible. Dried seeds used as a condiment, juice from the seed is used in making wine.

94. *Rhus succedanea* L.

<table>
<thead>
<tr>
<th>Family</th>
<th>ANACARDIACEAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonyms</td>
<td><em>Rhus succedanea</em> L. var. <em>himalaica</em> Hook. f.; <em>Rhus verniciflua</em> Stokes; <em>Rhus wallichii</em> Hook. f.; <em>Rhus vernicifera</em> DC., in part.</td>
</tr>
<tr>
<td>Botanical description</td>
<td>A small deciduous tree with large pinnate leaves.</td>
</tr>
<tr>
<td>Distribution</td>
<td>Grows in Pakistan extending up to Bhutan at 1200-2400 m.</td>
</tr>
</tbody>
</table>

Vernacular Names

E - Wild varnish tree, wax tree, galls; H - Kapra-singi; S - Karkatashringi; K - Karkata-shringi; Tam - Karkkaadagasurgi; Tel - Kapeera-sryngi

Parts used: Wood, resin, leaves, galls, mesocarp and fruit-kernel.

Medicinal uses

Ayurveda: Galls on the branches are astringent, tonic, expectorant and stimulant. Used in diarrhoea and dysentery. Ethanol extract of leaves shows anti-cancer and anti-viral action.

Uses as food: Mesocarp of the fruit edible.

95. *Ricinus communis* L.

<table>
<thead>
<tr>
<th>Family</th>
<th>EUPHORBIACEAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Botanical description</td>
<td>A herbaceous plant or a soft-wooded shrub with long-petioled palmately lobed leaves</td>
</tr>
</tbody>
</table>
Distribution: Native of the tropics, common in hills, cultivated or found growing in wastelands.

Vernacular Names

E - Castor oil plant; H - Endi; S - Eranda; K - Haralu; Mal - Chittamanakku; Tam - Amanakkam-chedi; Tel - Amudalu

Parts used: Roots, leaves and seeds

Medicinal uses

a) Ayurveda: Seeds yield castor oil, used effectively as a purgative. Purgative action is due to local irritation of the intestines caused by ricinoleic acid formed by hydrolysis due to the lipolytic enzymes. Decoction of roots given in lumbago. A paste made from seeds are applied to sores, boils and rheumatic swellings. Seeds find use in scorpion-sting and as fish poison. Poultice of leaves applied to relieve headaches and for boils.

b) Homeopathy: Castor-oil has marked action on the gastro-intestinal tract. Increases the quantity of milk in nursing mothers. Useful in vomiting, purging, langour and weakness.

Chemistry: Seeds are rich in alkaloid ricine, ricinine, 95% hydroxyacid, ricinoleic acid (fatty acid) and norlupan from the testa of the castor bean (Rastogi, 1990). Ricin, the seed lectin, is one of the most potent of plant toxins and inhibiting ribosome function.

Undecylenic acid prepared from the oil is antibacterial and a fungistatic (Tinea spp. and monilias) [Oliver (1960); Martindale 1958, p. 1331; Paulose et al., 1964].

96. Ruta graveolens L.

Family: RUTACEAE

Synonyms: Ruta angustifolia Pers., Ruta bracteosa DC., Ruta chalepensis L., Ruta graveolens L. var. angustifolia Hook. f.

Botanical description: Perennial herbs, leaves glandular-punctate
Distribution : Native to the Mediterranean region, cultivated all over India

Vernacular Names

E - Garden Rue; H - Pismarum, sadab, satari; S - Sadapaha; somalata; K - Naga dali soppu, simesdanu; Mal - Nagadhali; Tam - Aruvadom chedi, arvada; Tel - Arudu, serdapa

Parts used : Leaves, fruits and seeds

Medicinal uses

a) Ayurveda : Leaves are used as an anthelmintic, antispasmodic, antiepileptic, rubefacient and emmenagogue. Employed largely for veterinary purposes. In large doses it acts as an acronarcotic poison. Herb used in hysteria and amenorrhoea.

b) Homeopathy : Acts upon the periosteum and cartilages, eyes and uterus. Used in epistaxis and stiffness in wrists and hands.

Chemistry : Yields an essential oil containing heptyl ketone accounting for its low congealing point; Garden Rue Oil consists predominantly of methyl nonyl ketone with only small quantities of coumarins, essential oil and an unidentified agent. Seeds yield a drying oil.

Uses as food : Aromatic leaves used in salads, stews and ragouts. Leaves used as a condiment and garnish; also used for flavouring and pickling (Vitamin C 480 mg/100g).

97. Saccharum officinarum L.

Family : POACEAE (GRAMINEAE)

Botanical description : A tall, thick stemmed perennial grass

Distribution : Cultivated chiefly in Uttar Pradesh, Bihar, Punjab and South India

Vernacular Names

E - Sugarcane, noble cane; H - Paunda, ieekh, ganna; S - Ikshu, khanda, sarkara; K - Patta patti kabbu; Mal - Karimbu; Tam - Poovan karumbu; Tel - Cheruku
Parts used : Stem

Medicinal uses

a) Ayurveda : Sugarcane is used as a preservative, demulcent, antiseptic, cooling, laxative and diuretic. Vinegar prepared from sugarcane stimulates appetite, promotes digestion and allays thirst.

b) Homeopathy : Sugar is an antiseptic. Combats infection and putrefaction; has a solvent action on fibrin and stimulates secretion by the intense osmotic changes induced. Cures leg ulcers. Sugar must be considered a sustainer and developer of the musculature of the heart and hence useful in cardiovascular troubles. Acts as a nutrient and tonic, in wasting disorders, anaemia and neurasthenia. Increases weight and stamina. Used in opacity of cornea and in dim sight, in acidity and anal itching, as a cold expectorant and myocardial degeneration. Locally used in gangrene and in epilepsy. Sugar has an oxytocic property.

Uses as food : Sugarcane juice gives three sweetening products gur or jaggery, vacuum pan sugar, and open pan sugar or khandsari. A good quantity is also used for juice and chewing.

98. Salmalia malabarica (DC.) Schott. & Endl.

Family : BOMBACACEAE

Synonym : Ceiba pentandra L. Gaertn.

Botanical description : Large deciduous trees, trunk butressed at the base.

Distribution : Indigenous to Bengal; cultivated elsewhere.

Vernacular Names

E - Silk cotton tree; H - Semul; S - Panchpurni, Salmali; K - Booruga; Mal - Pula-maram; Tam - Illavam; Tel - Booruga.

Parts used : Root bark, stem bark, gum, fruits and seeds.
Medicinal uses

Ayurveda: Seeds are used in gleet, catarrh and consumption. Root bark used in fever. Gum is an astringent and aphrodisiac; used in diseases where secretion is excess like diarrhoea, dysentery, leucorrhoea, diabetes and haemorrhages. It is demulcent, tonic and styptic. Stem bark demulcent, tonic and styptic. Fruits stimulant, expectorant and diuretic used in calculus affections and ulceration of bladder and kidneys.

Chemistry: Seeds yield a good edible non-drying fatty oil. Gum contains tannic and gallic acids. The juice, roots and bark contains quercetol and kaempferol glucosides, traces of gossypiol, methylglucuronoxylan. The seeds contain B-sitosterol.

The glycosides are reported to be antidiabetic in India, needs checking Currie and Timell, 1959; Oliver-Bever, 1986).

Uses as food: Flower-buds and fleshy calyces used as vegetables. Seeds yield an edible fatty oil.

99. Santalum album L.

Family: SANTALACEAE

Botanical description: Sandal tree is a partial root parasite, especially when young

Distribution: Commonly occurring in dry regions of Karnataka and Tamil Nadu.

Vernacular Names

E - Sandal tree; H - Safed chandan, sandal; S - Chandana, ananditam, taliaparnam; K - Srigandha, gandha, agarugandha, bavanna, bhandrasri; Mal - Chandanam, chandana-mutti (wood); Tam - Sandanam, ulocidam, kulavuri; Tel - Chandanamu, chandanapuchettu, tellagandhapu-chettu (tree), gandhataruvu (tree), srigandhamu, gandhapu-chekka (wood)

Parts used: Heart wood of root and trunk

Medicinal uses

Ayurveda: Oil is extracted from the heartwood which is diuretic, diaphoretic, refrigerant and expectorant. Has
several applications in household remedies. It was used very widely as an antimicrobial agent till sulphonamides were discovered.

Chemistry: The bark contains a triterpenoid - Urs-12-In-3B-yl-Palmitate (Shankaranarayana et al., 1980) in addition to the sandalwood oil which is richly present in the secondary wood. The benzene extract of the bark inhibits insect growth and is a chemosterilant (Shankaranarayana et al., 1980). The sandalwood oil when incorporated into hair oil controls head lice. The sandalwood oil is a refrigerant and perfume. It is very effective against prickly heat.

100. **Schoenoplectus articulatus** (L.) Palla

<table>
<thead>
<tr>
<th>Family</th>
<th>: CYPERACEAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonym</td>
<td>: <em>Scirpus articulatus</em> L.</td>
</tr>
<tr>
<td>Distribution</td>
<td>: Common in tanks and pools all over India; upto 3000 ft. in the Himalayas.</td>
</tr>
<tr>
<td>Vernacular Names</td>
<td>: H - Chichora; S - Chichora.</td>
</tr>
<tr>
<td>Parts used</td>
<td>: Tubers and dried plants</td>
</tr>
<tr>
<td>Medicinal uses</td>
<td></td>
</tr>
<tr>
<td>Ayurveda</td>
<td>: Tubers given to stop diarrhoea and vomiting.</td>
</tr>
</tbody>
</table>

101. **Schoenoplectus grossus** L.f.

<table>
<thead>
<tr>
<th>Family</th>
<th>: CYPERACEAE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Synonym</td>
<td>: <em>Scirpus kysoor</em> Roxb.</td>
</tr>
<tr>
<td>Botanical description</td>
<td>: Herb, stem rigid, erect. and trigonous.</td>
</tr>
</tbody>
</table>
102. *Sida acuta* Burm. f.

Family : MALVACEAE

Synonym : *Sida carpinifolia* Mast., in part, non L.f.

Botanical description : Erect fruticose, glabrous herbs

Distribution : Throughout the hotter parts of India

Vernacular Names

H - Barlara kareta, kharenta; S - Bala; K - Cheruparuva. malatanni; Tam - Vattatirippi, malaitangi, mayir-manikham, pazhampaasi, ariva-mooku kelrai, pon musuttai, kayapunalu; Tel - Neelabenda, visha boddi, chitimutti, mutuvapulagam

Parts used : Roots, stem and leaves

Medicinal uses

Ayurveda : Leaves are demulcent and diuretic; boiled in oil and applied to testicular swellings and in elephantiasis. Decoction of leaves and roots emollient, used for haemorrhoids and impotence. Roots tonic, stomachic, diaphoretic, and antipyretic, used in nervous, bronchial and urinary disorders and bowel complaints, also used as an electuary for expelling worms.
Chemistry: Oil contains derivatives of trimethylamine (Githens, 1949). Alkaloids such as cryptolepine and vasicine are found in the stem and leaves which were found effective against Proteus vulgaris (Gunatilaka et al., 1980; Prakash et al., 1981; Oliver-Bever, 1986). Alkaloid ephedrine and L-amyrin were isolated from roots (Oliver-Bever, 1986).

103. Solanum nigrum L.

Family: SOLANACEAE

Synonyms: Solanum nodiflorum Jacq., Solanum guineense (L.) Lam.

Botanical description: An erect annual herb

Distribution: Occurs in all districts, at all elevations, a cosmopolitan weed of roadsides and cultivated land

Vernacular Names

E - Black nightshade; H - Makoi, gurkama; S - Kakamachi; K - Kakamunchi, kempukachi; Ma - Tadavalam; Tam - Manattakkali; Tel - Kachchipundu, kachi, kamanchi, gajju chettu.

Parts used: Herb, berries and seeds

Medicinal uses

a) Ayurveda: Antiseptic and antidysenteric, used in cardalgia and gripe. Infusion of herb applied to anthrax pustules. The herb also used as a diuretic and laxative; decoction narcotic and antispasmodic (Paris and Moyse, 1971). Freshly prepared extract of herb is effective in cirrhosis of liver. Juice of fresh leaves produces dilatation of the pupils. Berries tonic, diuretic and cathartic, used in anasarca and heart diseases. They are employed as a domestic remedy in fevers, diarrhoea and eye troubles. (Chopra et al., 1956). Leaves used as an adulterant of belladona.

b) Homeopathy: Used in ergotism, with tetanic spasms, stiffness of the whole body and with mania. In meningitis and chronic intestinal toxaemia. In brain irritation
during dentition. Restlessness of a violent and convulsive nature, formication with contraction of extremities. Used in vertigo, acute coryza and in constrictive feeling in the chest.

c) Others : In Nigeria a decoction of the leaves is used as a diuretic and laxative, the young shoots are given to heal psoriasis and other skin ailments (Dalziel, 1937).

Chemistry : Immature fruits contain four steroidal glycoalkaloids. Seeds contain a fatty oil. An alkaloid, solanine, extracted from the leaves has anticholinesterase action and used as an analgesic as well as a sedative on the CNS (Denoel, 1958). Green fruits contain solanine which on hydrolysis produces glucose, rhamnose and solanidine. Heterosides such as solasonine, solamargine and solanigrine were found (Henry, 1949; Paris and Moyse, 1971). Solanine, most abundantly found in the berries, is toxic at high concentrations and causes vomiting, diarrhoea and hyperglycemia. These alkaloids are used as raw material for the synthesis of progesterone on a commercial basis (Daniel, 1991).

Solanine from the leaf is antibacterial. It inhibits the growth of Staphylococcus aureus and Candida albicans.

Uses as food : Leaves and tender shoots are boiled and eaten like spinach. Ripe fruits used in pies and preserves and make a delightful jam.

104. Solanum surattense Burm. f.

Family : SOLANACEAE

Synonym : Solanum xanthocarpum Schrad. & Wendl.

Botanical description : A diffuse perennial conspicuous herb

Distribution : All districts in the plains and low hills, a weed of roadsides and waste land

Vernacular Names

E - Yellow berried nightshade; H - Kateli, katal, ringani; S - Kantakari, nidigadhika; K - Ramagulla, karigulla; Mal - Kandankattiri; Tam - Kandankattiri Tel - Pinnamulaka, nelamulaka, vankuda
Parts used : Whole plant

Medicinal uses

a) Ayurveda: Roots expectorant, form a constituent of Dasha moola. They are employed in cough, asthma and pain in the chest. Stem, flowers and fruits are carminative; used in the burning sensation in the feet accompanied by vesicular watery eruptions. Juice of the berries used for sore throat. Like roots, seeds also are administered as an expectorant in asthma and cough. Juice of the leaves, mixed with black pepper, is prescribed in rheumatism. Herb is an ingredient of a compound, Arkadhi, useful in dengue fever, bronchitis and fever accompanied by chest affectations.

b) Homeopathy: Excellent remedy for hoarseness with cough; catarrhal fever; chest pain; respiratory diseases with aphonia, bronchopneumonia; retention of urine. It is also a remedy in asthma. It is considered a sure preventive against small-pox.


Pharmacological studies have shown that aqueous and alcoholic extracts of the plant possess hypotensive effect which is partly inhibited by atropine. The beneficial effect in bronchial asthma may be attributed to the depletion of histamine from bronchial and lung tissue. Extract of the herb shows antiviral activity against Ranikhet disease virus and also against sarcoma 180 in mice.

Uses as food: Fruits used in curries. Seeds also edible.

105. **Solanum violaceum** Ortega

Family : SOLANACEAE

Synonym : Solanum indicum auct. non L.

Botanical description : Shrub, armed with short spines, stellately tomentose

Distribution : Commonly found occurring in plains and foot hills throughout India
Vernacular Names

E - Poison-berry, Indian nightshade; H - Barhanta, birhatta; S - Vrihati, bhanati; K - Kempugulla, habbugula; Mal - Cheru-chunda, cheruvazhudhena Tam - Mulli, pappara-mulli, karimulli; Tel - Tella-mulaka, kakimunchi

Parts used: Roots, leaves, fruits and seeds

Medicinal uses

Ayurveda: Roots carminative and expectorant, useful in coughs and catarrhal affections, dysuria and colic; pounded and applied to nasal ulcers. An ingredient of Dasha mool, an important Ayurvedic medicine. Fruits are laxative and digestive. Extracts of herb affect human epidermal carcinoma of the naso-pharynx in tissue culture and on Friend-virus leukaemia (solid) in mice. Utilization of fruits as alternative source of steroidal material for preparation of cortisone and steroidal sex hormones was suggested.

106. Stereospermum suaveolens DC.

Family: BIGNONIACEAE

Synonym: Bignonia suaveolens Roxb.

Botanical description: Tree

Distribution: Occurs throughout India.

Vernacular Names

E - Trumpet-flower tree; H - Paral, padiala, padaria, Padal; S - Patala; K - Hudaybilla, vulumantrimarada, kavi; Mal - Parul; Tam - Padri; Tel - Goddali pulusu, kalagora, kulerakshi, patali

Parts used: Root, stem bark, wood, leaves and flowers

Medicinal uses

Ayurveda: Root-bark is an ingredient of Dasha mool. Decoction of roots used for intermittent and puerperal fevers, inflammatory chest affections, affections of the brain. Stem bark diuretic and tonic. Flowers given with honey to stop hiccups.
Chemistry: Flowers contain albuminous saccharine and mucilaginous substances and wax.

Ethanolic extract showed activity against Ranikhet disease; also showed hypoglycaemic action in rats and anti-cancer activity against human epidermoid carcinoma of the nasopharynx in tissue culture.

107. **Streblus asper** Lour.

**Family**: MORACEAE

**Botanical description**: Small gnarled ever green tree with rough leaves.

**Distribution**: Drier parts of India.

**Vernacular Names**

E - Siamese Rough brush; H - Siora, khorus, dahia, cheeroopathi; S - Shakhotaka; K - Ponalige, punje, mitligade; Mal - Paruva; Tam - Piray, kakkabedi, barivenkachettu; Tel- Barinika, barniki.

**Parts Used**: Roots, bark, latex, fruits and seeds.

**Medicinal Uses**

**Ayurveda**: Decoction of bark given in fever, dysentery and diarrhoea.

A poultice of roots applied to chronic ulcers and sinuses. Antidote to snake bite. Milky juice used as antiseptic, astringent, applied to chapped hands, glandular swellings and sore heels. Bark contains a bitter substance.

Twigs are chewed for cleaning teeth and to cure pyorrhoea. Poultice of roots is applied to inflamed swellings and boils. Leaves used as a galactogogue. Poultice of leaves applied to swellings and buboes. Pulverized roots are given in dysentery. Latex applied to the temples as sedative in neuralgia. Seeds used in epistaxis, piles and diarrhoea. Externally the paste is applied in leucoderma.

**Chemistry**: Root bark extract yielded glycoside derivatives such as kamaloside, asperoside, cannodimethoside, glucokamaloside, glucogitodomethoside and strophanolloside (Rastogi and Mehrotra, 1990).
The extract of the root bark induced a positive inotropic effect and systolic response in isolated frog's heart. At dilutions of 0.05 µg to 0.5 µg tonic contractions were observed in the rabbit intestine and guinea pig uterus in vitro. Cardenolide produced increased contraction of the rabbit heart in vitro; the effect was prolonged compared to adrenaline (Rastogi and Mehrotra, 1990).

Uses as food: Fruits are edible. Infusion of leaves taken as a substitute for tea. Wood used for making yokes and wheels of carts.

108. **Striga lutea** Lour.

**Family**: SCROPHULARIACEAE

**Synonym**: *Striga asiatica* (L.) Kuntze.

**Botanical description**: An erect scabrous hirsute branching parasitic herb with yellow flowers

**Distribution**: Occurs in all Districts, upto 7,000 ft in hills, dry grassy places and among crops

**Vernacular Names**

H - Agia; S - Kuranti, agnivruksha; K - Berumarigida, bilikasa, hotke; Mal - Theepalli; Tam - Pallipoondu; Tel - Pogaakumalle, errakanchamma konda

**Parts used**: Whole plant

**Medicinal uses**

Ayurveda: Plant is bitter; improves appetite and taste; useful in strangury and diseases of blood.

109. **Swertia chirayita** (Roxb. ex Flem.) Karst.

**Family**: GENTIANACEAE

**Synonym**: *Swertia chirata* Buch.-Ham. ex C.B. Clarke

**Botanical description**: Herb, stem four angled
Distribution : Distributed in temperate Himalayas from Kashmir to Bhutan and in Khasi hills

Vernacular Names

E - Chiretta; H - Chirayita; S - Kirata-tikta, bhunimba; K - Nelabevu; Mal - Nilaveppa; Tam - Shirat-kuch-chi, nilavembu; Tel - Neelavemu, neelaveru

Parts used : Dried plants

Medicinal uses

a) Ayurveda : Chiretta is esteemed as a bitter tonic and febrifuge; also used against asthma and liver disorders. Used as a laxative. If taken with sandalwood paste, it stops internal haemorrhage of the stomach.

b) Homeopathy : Chirata is well indicated in dyspepsia, flatulence, anorexia and used as a vermifuge.

c) Unani : Bark arrests uterine haemorrhages and is used as an aphrodisiac and an anti-inflammatory. An infusion of the plant used as tonic to the heart, liver and eyes; a good resolvent, astringent, in coughs, scanty urine, sciatica and skin diseases.

Chemistry : Dried plants constitute the drug chitara or Brown or white chiretta, which is distinct from Green Chiretta derived from Andrographis paniculata Nees, used as an adulterant. Herb also yields a dye. Bark contains two alkaloids, loturine and colloturine which are chemically related to harmine found in Peganum harmala (Chopra et al., 1956).

Taxonomic Notes : As Swertia chirayita does not occur in Southern India, Swertia corymbosa Wt. is substituted.

110. Symlocos racemosa Roxb.

Family : SYMPOCACEAE

Synonym : Symlocos beddomei C.B. Clarke

Botanical description : Trees, leaves elliptic-lanceolate
Distribution: Throughout Northern India, up to 2500 ft.

Vernacular Names

E - Lodh tree; H - Lodh; S - Lodhra, marjana, tillaka; K - Balalodduginamara, pachettu; Mal - Pachotti; Tam - Velli-lothi; Tel - Lodduga, erralodduga

Parts used: Bark, wood and leaves

Medicinal uses

Ayurveda: Bark astringent, used in diarrhoea, dysentery, liver complaints, also used for ophthalmia and conjunctivitis. Decoction employed to stop bleeding of gums. In combination with sugar, bark used for menorrhagia and...

111. *Syzygium aromaticum* (L.) Merrill & Perry

Family: MYRTACEAE


Botanical description: A tree

Distribution: Cultivated in the Southern districts of Tamil Nadu, Kerala and Karnataka

Vernacular Names

E - Clove tree; H - Laung; S - Lavangaha; K - Lavanga; Mal - Karayampu, krambu Tam - Kirambu; Tel - Lavangamuchettu (tree), lavangamulu (buds)

Parts used: Stems and floral buds

Medicinal uses

a) Ayurveda: Cloves are aromatic, stimulant and carminative, used in dyspepsia and gastric irritation. Clove oil is an ingredient of dentrifices, gargles and chewing gums. Oil is employed as a local analgesic for...
hypersensitive dentines and carious cavities; used externally as a rubefacient and counter irritant and internally as a carminative and antispasmodic. Oil has a benumbing action on nerves, hence used as a local anaesthetic.

b) Unani : Cloves are used as an aphrodisiac, carminative, in paralysis, bronchitis, nausea, loss of appetite and hiccough.

Chemistry : The peduncle of clove contains 6% oil, the leaves contain 3-4%. The flower bud oil is highly valued for its aromatic flavour. Dried clove buds yield 70-90% eugenol, 17% eugenol acetate and 5-12% caryophyllene. Oleanolic acid constitutes a fraction of the non-volatile oil, besides, carbohydrates such as glucose, rhamnose, xylose, galactose and steroids such as sitosterol, stigmasterol and compestrol have been identified. Tannins contribute to the darkening of the ageing oil. Flavanoids (quercetin and kaempferol have been reported (Gopalakrishnan, 1989).

Uses as food : Dried unopened floral buds, known as cloves, are esteemed as a flavouring; also used in spicing wines, for scenting chewing tobacco, and as an ingredient of betel-chew. Clove oil, is extensively used for flavouring food products and fermented beverages.

112. Syzygium cumini (L.) Skeels

Family : MYRTACEAE

Synonym : Eugenia jambolana Lam.

Botanical description : A large evergreen tree with white flowers and purple fruit.

Distribution : Throughout the plains from the Himalayas to South India.

Vernacular Names

E - Jaman, Jambolan, Black plum, Java plum; H - Jaman, Jam;
S - Jambu; K - Nerale; Mal - Naval, perinnaral; Tam - Neredam, naval, sambal; Tel - Neredu.

Parts Used : Bark, leaves, fruits and seeds.
Medicinal Uses

a) Ayurveda: Bark, leaves and seeds are astringent. Berry as a whole is astringent.

Bark used in gargles and mouthwashes. Decoctions of bark and that of powdered seeds are used in diabetes.

Juice of the fruit is stomachic, astringent and diuretic and anti-diabetic.

The decoction of the bark is used in cases of chronic diarrhoea, dysentery and spongy gums. Paste of the bark is applied over inflamed areas. Juice of tender leaves given in case of diarrhoea. Powdered seeds diminishes the quantity of sugar in urine and allays thirst of diabetics.

b) Homeopathy: Has an immediate effect of increasing the blood sugar, glycosuria results. A most useful remedy in diabetes mellitus. But over dosage is followed by weakness and fatigue, tremulousness and profuse sweating.

Chemistry: Seed contains a glucoside jambosine, ellagic acid, essential oil, chlorophyll, fat, resin, gallic acid, albumen. Bark contains tannin and gum. Glucoside jamboline prevents the conversion of starch to sugar in the case of diabetics.

Uses as food: Ripe fruits edible, a spirituous liquor as well as wine is prepared from them. Fruits also used for making preserves, jams, squashes and jellies. Blossoms are an important source of honey.

113. Tamarindus indica L.

Family: CAESALPINIACEAE

Botanical description: Evergreen trees

Distribution: Frequent in dry plains along roadsides. Cultivated extensively

Vernacular Names

E - Tamarind tree; H - Imli, amli, anbli; S - Amlika, chincha; K - Huli, amli; Mal - Pulī, amlam; Tam - Pulī, amlam; Tel - Chintachettu (tree), chintapandu (fruit)
Parts used : Bark, wood, leaves, flowers, fruit pulp and seeds

Medicinal uses

Ayurveda : Fruit pulp is a refrigerant, carminative, and laxative, given as infusion in biliousness and febrile conditions. Bark, leaves and seeds are astringent. Tender leaves and flowers are cooling and antibilious. Pulp of ripe fruit and paste of the leaves are anti-inflammatory. Testa of the seed is used as a valuable remedy in diarrhoea and dysentery. Poultice of flowers used in the inflammatory conditions of the eye. Extract of the flowers given for bleeding piles. Decoction of leaves used as a gargle in throat affections (Nadkarni, 1954).

Chemistry : The bark, leaves and flowers yielded hordenine (Rastogi and Mehrotra, 1990). Fruit contains tartaric acid and traces of oxalic acid (Chopra et al., 1956). Tamarind pulp contains 3.1 g protein; 0.1 g fat; 5.6 g fibre; 67.4 g carbohydrates; 170 mg calcium; and 3 mg Vit C (Gopalan et al., 1985). Seeds contain albuminoids, fats and 63.22% carbohydrates (Nadkarni, 1954).

Uses as food : Fruit pulp is one of the most acidic naturally occurring products and is the principal souring agent for sauces, chutneys and beverages. Pulp is freed from fibre and seed, mixed with about 10% salt and preserved. Because of its antiscorbutic properties, pulp was used by sailors instead of lime or lemon juice. Kernels are used as food in times of scarcity, alone or mixed with cereal flour. The polysaccharide (jellose) in tamarind kernel powder forms gel with sugar concentrates, as do fruit pectins, and is an excellent substitute for fruit pectins, in the manufacture of jams, jellies or marmalades. Tender leaves, flowers and young seedlings eaten as vegetables. Flowers are a good source of honey which has slight acidity peculiar to flowers.

114. **Terminalia bellirica** Roxb.

**Family** : COMBRETACEAE

**Synonym** : *Myrobalanus bellirica* Gaertn.

**Botanical description** : Trees upto 8 m tall
Distribution: Throughout the forests of India, below elevations of 3000 ft., except in dry and arid regions of Sind and Rajasthan.

Vernacular Names

E - Belliric myrobalan; H - Bahera; S - Vibhitaki; K - Taarekaayi mara, shanthimara; Mal - Thanf; Tam - Tani; Tel - Tani.

Parts used: Bark, wood, fruits and kernels.

Medicinal uses

Ayurveda: Ripe fruits used as an astringent in combination with chebulic myrobalan; half ripe fruits used as a purgative due to presence of an oil having properties similar to castor oil. The oil is applied to the hair and rheumatic swellings. Mixed with honey, the fruit pulp is employed in ophthalmia. Bark diuretic and gum demulcent and purgative. Fruit is bitter, tonic, antipyretic, used in piles, dropsy, biliousness, leprosy and headache. Kernel is narcotic (Chopra et al., 1956).

Chemistry: Oil extracted from the kernel has purgative action and its prolonged action was tolerated in mice. The hydrolysed fraction is an irritant. A cardiac glycoside bellericin isolated yielded glucose and galactose (Rastogi and Mehrotra, 1990). Fruits contain 17% tannin (Chopra et al., 1956).


Family: COMBRETACEAE

Synonym: *Myrobalanus chebula* (Retz.) Gaertn.

Botanical description: Trees upto 15-20 m tall

Distribution: Occurring throughout the deciduous forests of India.

Vernacular Names

E - Chebulic myrobalan, black myrobalan, ink nut; H - Harra; S - Haritaki; K - Alalekaayi; Mal - Kadukka Tam - Kadukka Tel - Karakkai.
Parts used: Roots, tree, bark and fruit

Medicinal uses

a) Ayurveda: Fruits laxative, stomachic, tonic and alterative; forms a constituent of Triphala, used for a host of ailments. The laxative principle, a glycoside, may be similar to sennoside. Fruit pulp used in dentrifices. Coarsely powdered fruit is smoked in asthma. Bark diuretic and cardiotonic.

b) Homeopathy: Indicated in bleeding piles, diarrhoea, chronic dysentery, vertigo, dropsy and in some skin diseases.

c) Unani: Fruits used to improve memory and vision. Controls diarrhoea, piles and headache (Nadkarni, 1954).

Chemistry: Fruits are a rich source of terchebin, a tannin; large amount of gallic acid and chebulinic acid (Nadkarni, 1954). Chebulin isolated from flowers has a melting point of 249°C (Rastogi and Mehrotra, 1990).

LD50 of chebulin was found to be 550 mg/kg in mice. Chebulin is antispasmodic in action similar to papaverine (Rastogi and Mehrotra, 1990). The dry fruit powdered contains quercetin, chebulin and caffeic acid which reduces the blood sugar (Nagaraju and Rao, 1989).

116. Tinospora cordifolia (Willd.) Miers ex Hk. f. & Thoms.

Family: MENISPERMACEAE

Botanical description: Deciduous, large, climbing, glabrous shrub.

Distribution: Throughout tropical India and the Andamans

Vernacular Names

E - Gulancha tinospora; H - Amrita, giloe; S - Amrita, guluchi, jwarari, gudicchi; K - Amruthaballi; Mal - Amrytu, chittamritam; Tam - Amudom, chindil; Tel - Tippateege

Parts used: Root, bark, stem, leaves and fruits
Medicinal uses

a) Ayurveda: Juice of fresh plant diuretic, useful in gonorrhoea. Stem is a constituent of several Ayurvedic preparations used in general debility, dyspepsia, fevers and urinary disease; dry twigs with bark intact, constitute the drug. Bitter principles present in the drug show antispasmodic, antipyretic, anti-inflammatory and anti-cancerous properties. A kind of starch called Giloe-ka-sat, prepared from aqueous extract of dry stems, is used as a tonic, in chronic diarrhoea and dysentery.

The decoction of leaves given in gout. Root is a powerful emetic and used for visceral obstruction; its watery extract is used in leprosy. Pulverized fruit is used as a tonic and also in jaundice and rheumatism (Rastogi and Mehrotra, 1990). Tinospora cordifolia has been attributed to have hypoglycaemic and diuretic effects (Nanjoshi, 1955).

b) Homeopathy: It has curative influence over seminal debility, fevers, jaundice, splenic affections, leprosy, leucorrhoea, rheumatism, skin diseases, secondary syphilis, gonorrhoea and dysuria. Also used in acute or chronic malarial fever.

Chemistry: Glycosides namely giloin and giloinin are reported to be present in fresh stems (Paris and Beauquesne, 1938; Paris and Moyse, 1963). Stem contains berberine (Chopra et al., 1956).

The plant possesses one fifth of the analgesic effect of sodium salicylate.

Experiments conducted on rabbits indicate that aqueous and alcoholic extracts caused reduction in fasting blood sugar and glucose tolerance was increased, but a deterioration in tolerance occurred after a month's treatment. It was suggested that the action of the drug is due to its effect on the endogenous insulin secretion, glucose uptake, and inhibition of peripheral glucose release.

117. Trachyspermum ammi (L.) Sprague

Family: APIACEAE (UMBELLIFERAE)

Synonym: Carum copticum Benth. ex Clarke
<table>
<thead>
<tr>
<th><strong>Botanical description</strong></th>
<th>An erect aromatic herb, stem semi-woody, cylindrical, green and ribbed.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Distribution</strong></td>
<td>Cultivated in Madhya Pradesh, Andhra Pradesh, Uttar Pradesh and Karnataka</td>
</tr>
<tr>
<td><strong>Vernacular Names</strong></td>
<td>E - Bishop's weed, Lovage, Ammi, Carum; H - Ajwain, Ajowan, Ajvan, Onva; S - Ajmoda; K - Omu, Oma, Omakki, Ajvana; Mal - Omam, ayamodakam; Tam - Omum, asampadam, amam; Tel - Omamu, Vaamu</td>
</tr>
<tr>
<td><strong>Parts Used</strong></td>
<td>Roots and fruits.</td>
</tr>
<tr>
<td><strong>Medicinal Uses</strong></td>
<td><strong>Ayurveda</strong> : Fruits (Ajowan, omum) are stimulant, antispasmodic, tonic and carminative, administered in flatulence, atonic dyspepsia and diarrhoea. Also often recommended in cholera. Ajowan is used for relaxed sore throat and bronchitis and is a common ingredient of cough mixtures. A paste of crushed fruits is applied to the abdomen externally for relief from colic. It shows antibiotic activity and is used in lotions and ointments applied for checking chronic discharge. Roots are carminative, diuretic, used in febrile conditions and stomach disorders. Ajowan oil from fruits is employed as an aromatic, carminative and antiseptic, as an expectorant in emphysema, bronchial pneumonia and other respiratory ailments. Aqueous solution left after separation of essential oil is called Omum water, used as a carminative in flatulence and grippe. Fruits also yield a fatty oil, used externally on rheumatic swellings. Fruits have considerable antifungal activity against pathogenic fungi. Hot fomentation of fruits on chest is useful for asthma (Chopra, et al., 1956). <strong>Chemistry</strong> : Essential oil yielded by the fruits is called Ajowan (4-6%) oil. Principle constituent of oil is thymol 45-55% of which can be crystallised from the oil and is known as Flowers-of-Ajowan. <strong>Uses as food</strong> : Fruits used as a spice, in pickles, confectionery and beverages.</td>
</tr>
</tbody>
</table>
118. **Trachyspermum roxburghianum** (DC.) Craib.

**Family** : APIACEAE (UMBELLIFERAE)

**Synonyms** : *Trachyspermum involucratum* Wolff, *Carum roxburghianum* Benth. ex Kurz.

**Botanical description** : An annual about 3 ft. high.

**Distribution** : Cultivated in India.

**Vernacular Names**

E - Bishop's weed, Lovage, Ajawa seeds; H - Ajmud, ajmod, ajmot, chanu, randhuni, ajmuda; S - Ajmada; K - Ajmodavoma; Māl - Homam; Tam - Ashamtagam, ashamtavomam; Tel - Ajumoda-vaamu, ashumadagavaamu; ashumadagavoman.

**Parts Used** : Leaves, fruits and seeds.

**Medicinal Uses**

*Ayurveda* : Fruits (Ajmud) used as a stimulant, carminative. Used as a cardiac tonic and emmenagogue, in bronchial and asthmatic troubles, stomachic, in dyspepsia, hiccoughs, vomiting and pain in bladder (Nadkarni, 1954).

*Chemistry* : Seeds yield an essential oil with D-limonene, L-terpinene, dipentene, D-linalool, terpinenol, dl-piperiton, thymoquinol, thymol and a crystalline ketonic acid.

**Uses as food** : Fruits are used as spice and in preparing pickles, preserves and chutneys. Leaves are used as a substitute for parsley. Aromatic fruits are used in flavouring curries.

119. **Trichosanthes dioica** Roxb.

**Family** : CUCURBITACEAE

**Botanical description** : A climbing herb, stem woolly

**Distribution** : Cultivated throughout the plains of North India
Vernacular Names

E - Pointed gourd; H - Parwal; S - Putuliku; K - Kaadupadavala; Mal - Patolam; Tam - Kombu-pudulai; Tel - Kommupotla

Parts used : Leaves, fruit and seeds.

Medicinal uses

Ayurveda : Fruits are useful for convalescents, as they are laxative and easily digestible. Fruits show some prospects in the control of some cancer-like conditions. Leaves and roots are cathartic and febrifuge. Fruit used to treat spermatorrhoea.

Chemistry : Roots contain saponin hentriacontane, a phytosterol, a glycoside and traces of tannin (Chopra et al., 1956). Seeds contain a fatty oil.

Extracts of seeds show very strong haemagglutinating activity.

Uses as food : Fresh extract of unripe fruit used as a cooling, laxative and as an adjunct to alternative medicine. Fruits consumed as a vegetable; also used in confectionery and pickled. Leaves edible.

120. Uraria picta Desv.

Family : FABACEAE (PAPILIONACEAE)

Botanical description : A perennial, erect undershrub reaching 3 ft in height recognised by narrow white-clouded upper leaflets and white jointed pods

Distribution : A native of tropical Africa, widely occurring in Srilanka, Malay, Phillipines, Java and less commonly in India

Vernacular Names

H - Dabra; S - Prasniparni; Tam - SittirappaladaI

Parts used : Roots, herb and pods
Medicinal uses

Ayurveda: Total extract of the herb effected quicker healing of fractures in experimental animals due to early accumulation of phosphorus and more deposition of calcium (Nadkarni, 1954). Decoction of the root given in cough, chills and fevers. Roots and pods are employed for the treatment of prolapse of anus in infants; pods also used for sore mouth.

In Ayurvedic treatment, roots of Uraria picta constitute, one of the ingredients of 'Dasamulaarishtha'. Tribes of Gujarat use the powdered seed mixed with honey in acute dysentery. A paste of the leaves is used by the Umarapada tribal women to stop excess menstrual flow. In other tribal areas the crushed plant is applied as an antivenom to snake bites. Roots are used as an aphrodisiac.

Gupta et al., (1984), showed antipyretic and anti-inflammatory action of Dasamula kvatha against carragenin induced oedema, thus proving its beneficial effects in treating pain, gout, pyrexia, sciatica and oedema (Gopal and Misra, 1991).

121. Vetiveria zizanioides (L.) Nash

Family: GRAMINEAE (POACEAE)

Synonyms: Andropogon muricatus Retz., Andropogon squarrosus Hook. f., non L. f., Anatherum zizanioides (L.) Hitchcock & Chase

Botanical description: Coarse, perennial herbs with stout rhizomes. Roots are aromatic

Distribution: In all districts except on the West Coast. Found up to 3000 ft.

Vernacular Names

E - Vetiver, khas, khus-khus; H - Khas, bena; S - Reshira, sugandhimula; K - Vattiveeru, laamanche, kaadu karidappasajje hallu; Mal - Ramaccham, vettiveeru; Tam - Vettiver; Tel - Kuruveeru, vettivellu, vettiveeru

Parts used: Roots and leaves
Medicinal uses

a) Ayurveda: Essential oil from roots is diaphoretic, stimulant, febrifuge and refrigerant, used in colic, flatulence and obstinate vomiting. Affords relief when applied in rheumatism, lumbago and sprains.

b) Unani: Tonic to the heart and brain, blood purifier, headache and palpitation.

Chemistry: The oil yields a sesquiterpene hydrocarbon, isobisabolene, khusol, khusinol, khusinol oxide, khusenic, isokhusenic acid, khusimene and khusimol.

Uses as food: Fragrant roots yield an essential oil, called vetiver oil, widely used for scenting sherbets.


Family: Fabaceae (Papilionaceae)

Synonyms: Vigna cylindrica (L.) Skeels
           Vigna catjang Walp.
           Vigna sinensis (L.) Sav & Hask.

Botanical description: Herb.

Distribution: Cultivated throughout India. Occurs in warm and tropical countries. Probably Asian in origin.

Vernacular Names

E - Cowpea; H - Lobia; S - Rajamasha; K - Alsandî; Mal - Kottapayuru, Vellapayarî; Tam - Caramanni payira; Tel - Alusundi, bobbarlu

Parts used: Seeds.

Medicinal Uses

Ayurveda: Cowpea is considered as antibilious and prescribed in hepatic troubles and jaundice. Seeds are acrid, dry, with a good flavour, laxative, appetiser, galactagogue, tonic, aphrodisiac, anthelmintic, but causes flatulence (Nadkarnî, 1954).
Chemistry: Cowpea contains 97% edible portion; of which 24.1g protein; 1g fat; 3.2g minerals; 3.8g fibre; 54.5g carbohydrates; 323 K Cal energy; 77mg calcium; 414mg phosphorous; 5.9mg iron and 12mg vitamins (Gopalan, et al., 1985). Seeds contain r-L-Glutamyl-S-methyl-L-cysteine (Rastogi and Mehrotra, 1990).

Seeds contain stigmasterol, may be used in the preparation of steroidal hormones (Chopra et al., 1969).

Powdered seeds produced a lowering of blood sugars by 42% in fasted rats. It was observed that the level of cholesterol was lowered by 26.7% in rats (Oliver-Bever, 1986).

Uses as food: Seeds are edible.

123. **Vitis vinifera** L.

**Family**: VITACEAE

**Botanical description**: Climbing shrub with tendrils opposite to the leaves.

**Distribution**: Cultivated in Deccan hills, in Karnataka and Andhra Pradesh

Vernacular Names

E - Common grape wine; H - Angur; S - Draksha; K - Angura, drakshi; Mal - Mundiri; Tam - Kodimundiri; Tel - Draksha.

Parts used: Sap, leaves and fruits (unripe, ripe and dried).

**Medicinal Uses**

**Ayurveda**: Fresh grapes are laxative, stomachic, diuretic, demulcent and cooling. Juice of unripe fruits used in throat affections. Leaves are astringent, and antidiarrhoeic. Sap of young branches used in skin affections. Dried grapes are considered as attenuant, supplicative, nutritious, blood purifier, useful in thirst, to reduce body heat, in cough and in hoarseness of voice (Chopra, et al., 1956).

**Chemistry**: Blue variety of grapes contains 0.6g protein; 0.4g fat; 13.g carbohydrates; 58 K Cal energy; 20mg Calcium; and 23mg Phosphorous.
The pale green variety contains 0.5g protein; 0.3g fat; 16.5g carbohydrates; 71 K Cal energy; 20mg Calcium; and 30mg phosphorous.

Unripe fruits contain oxalic, malic, tartaric and racemic acids (Chopra et al., 1956).

Anthocyanin pigments were identified as 3-monoglucosides of malvidin, paeomadin, delphidin and petumidin (Rastogi and Mehrotra, 1990).

Uses as food: Varieties of grapes eaten and fermented to yield wine, brandy, etc.

124. Xeromphis spinosa (Thunb.) Keay

Family : RUBIACEAE

Synonyms : Randia dumetorum Poir.
Randia spinosa Poir.
Randia brandisii Gamble
Randia longispinosa Wt. & Arn.,
Randia tomentosa Wt. & Arn.,
non Blume

Botanical description : A large spiny deciduous shrub or small tree

Distribution : Occurs from Himachal Pradesh to Sikkim. Commonly found in the hot valleys of Nepal and Western Ghats.

Vernacular Names

E : Common emetic nut; H : Mainphal; S : Madana; K : Kare, banegara, mangri; Mal : Kara; Tam : Marukkallankay, mad karai; Tel : Manga.

Parts used : Roots, bark, wood, flowers, fruits and seeds.

Ayurveda : Fruits are emetic and are used as substitute for ipecacuanha (Cephaelis ipecacuanha A. Rich.); in small doses expectorant and diaphoretic. Medicinal activity attributed
to saponins. Bark astringent, given in diarrhoea and dysentery; infusion used as an emetic; considered an abortifacient. Bark is a sedative, given to relieve pains due to bruises, and bone ache during fever; used internally or externally as an anodyne in rheumatism. Seeds used to induce appetite.

Chemistry: The root yielded an iridoid compound. Fruit yields a fat (Sat et al., 1986).

Uses as food: Fruits eaten after roasting or cooking.

125. Zingiber officinale Rosc.

Family: ZINGIBERACEAE

Botanical description: Plants with aromatic tuberous rootstock.

Distribution: Widely cultivated in India.

Vernacular Names

E - Common ginger; H - Adrak; S - Ardraka; K - Ardraka; Mal - Andrakam; Tam - Inji; Tel - Ardrakamu, allamu

Parts used: Rhizome, plant

Medicinal Uses

a) Ayurveda: Rhizome used as a stimulant, carminative, in dyspepsia and flatulent colic; prescribed as an adjunct to many tonics and stimulating remedies.

The plant is used with pepper as an abortifacient (Chopra et al., 1956).

Dried rhizomes are sialagogue, digestive, a local stimulant and rubefacient (Nadkarni, 1954).

b) Homeopathy: Ginger is used in debility of the digestive tract, respiratory troubles and dysfunction of the sexual system. Remedy for heaviness in stomach, flatulence and thirst.

Ginger finds its use in colic, diarrhoea due to intake of contaminated water, chronic intestinal catarrh and in hot and painful haemorrhoids.
Ginger also finds its use in treating the malfunction of the kidneys, urinary troubles and in hoarseness of voice (Boerjcke, 1991).

c) Unani : Rhizomes are carminative, digestive, aphrodisiac, sedative in pain, strengthen memory, remove obstruction in the vessels, used in nervous diseases, incontinence of urine and in balgham.

Chemistry : Rhizomes contain potassium oxalate, essential oil, with camphene, β-phellandrene and zingiberene. Rhizome yields volatile oil containing camphene, phellandrene, cineol, citral, borneol and zingiberene; gingerol and shogaol are the pungent constituents (Chopra, et al., 1956).

Fresh ginger constitutes 2.3g, protein, 0.9g fat; 2.4g fibre; 12.3g carbohydrates; 67 K Cal energy; 20 mg calcium and 60mg phosphorus (Gopalan et al., 1985).

Ginger oil obtained by steam-distillation yields constituents such as monoterpenes, sesquiterpenes and oxygenated terpenes (Zingiberene, Zingiberol, Citral, Phellandrene, nerolidol, borneol, linalool and methyl heptenone) (Shankaranarayana, and Krishnamurthy, 1987).

Uses as food : Rhizome used as a condiment for culinary purposes.

126. Zizyphus mauritiana Lamk.

Family : RHAMNACEAE

Synonym : Zizyphus jujuba Lamk.

Botanical description : Moderate sized prickly tree with pubescent branches.

Distribution : Often found as a cultigen in villages all over India; cultivated in many parts of the country.

Vernacular Names

E - Jujube fruit; H - Baer; S - Badari; K - Barihannu; Mal - Ilantha; Tam - Elandai; Tel - Regu.
Parts used: Root, bark, fruit and seeds

Medicinal Uses

Ayurveda: Root useful as a decoction in fever and delirium. Juice of the root bark used as a purgative and externally in gout and rheumatism. Bark, an astringent, is a remedy for diarrhoea. Powdered bark is used as a dressing to wounds and ulcers. Leaves are laxative and given in throat affections (Singh et al., 1983). A poultice of leaves used on boils, as a plaster in strangury, abscesses, carbuncles and in scorpion sting (Nadkarni, 1954). Fruits are stomachic, a mild laxative and expectorant. Used against bilious complaints, in digestion and 'bad' blood. Kernels are sedative, antiemetic, antidote and pain killer. Seeds are antidiarrhoeic and a contraceptive.

Chemistry: Stem bark contains tannin and zizyphic acid (Nadkarni, 1954).

The bark contains leucocyanidin.

The wood contains leucopelargonidin, betulinic and ceanothic acids (Rastogi and Mehrotra, 1990).

The fruit constitutes 0.8g, protein; 0.3g fat; 17g, carbohydrates; 74 K cal energy; 4 mg calcium and 9mg, phosphorous (Gopalan et al., 1985).

Uses as food: Fruits are eaten.

Nomenclatural Notes: Zizyphus jujuba Lamk; is a later homonym of Z. jujuba Mill. The correct name is Z. mauritiana Lamk.
Aconitum heterophyllum
Adhatoda vasica - flowering branch
Amomum subulatum

a. Fruits   b. Seeds
Azadirachta indica

a. Flowering branch, b. Flowers
Azadirachta indica
c. Seeds and kernels
Boerhavia chinensis
Boerhavia diffusa

a. Twig  b. Flowers
The variety with white flowers is considered by some taxonomists as Calotropis procera R. Br. The difference between Calotropis gigantea and Calotropis procera should be based on corona character and not flower colour. Consequently, the blue and white flowered plants are to be considered as varieties of Calotropis gigantea R. Br.
Calotropis gigantea

a & b. Flowering branches of white and blue-flowered varieties
Cinnamomum zeylanicum - flowering branch
Coriandrum sativum - flowering branch
Dalbergia sissoo

a. Flowering branch
b. Ripe pods
Elephantopus scaber - whole plant
Elettaria cardamomum - plant with fruits
Mesua ferrea - mature fruits
Myristica fragrans

a. Flower   b. Fruit
Myristica fragrans

c. Nutmeg and Mace
Nymphaea stellata - leaves & flower
Oroxyllum indicum - mature pods
Pinus longifolia - branch with female cone
Piper cubeba - fruits
Piper longum - fruits
Plumbago zeylanica

a. Flowers
b. Fruits
c. Seeds
Pongamia *glabra*

a. Branch with flower buds
b. Flowers
Pongamia glabra

c. Unripe pods
d. Mature pods
Ricinus communis

a. Branch with male and female flowers
Ricinus communis

b. Fruits
c. Mature fruit and seeds
PLATE 29 (96)

Ruta graveolens

a. Whole plant
PLATE 30 (96)

Ruta graveolens

b. Flowers
c. Fruits
PLATE 31 (09)

Santalum album

a. Tree in bloom    b. Mature fruits
Sida acuta - whole plant
Solanum nigrum

a. Flowers       b. Unripe fruits
Streblus asper - branch with female flowers
Terminalia bellirica - mature fruits
Terminalia chebula - mature fruits