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Saccharum munja Roxb.

Synonym ▶ *S. sara* Roxb.
S. bengalense Retz.
Erianthus munja Jesw.

Family ▶ *Gramineae; Poaceae*.

Habitat ▶ Throughout the plains and low hills of India.

Ayurvedic ▶ Munja, Bhadramuja, Vaana, Shara, Sara, Raamshara.

Siddha/Tamil ▶ Munjipul, Munjap-pullu.

Folk ▶ Sarpata.

Action ▶ Refrigerant. Useful in burning sensation, thirst, dyscrasia, erysipelas and urinary complaints.

The Ayurvedic Pharmacopoeia of India recommends the use of the root in dysuria, giddiness and vertigo.

The stem is a good source of furfural (yield 5.67%, dry basis). It yields 19.5% (on dry weight) of reducing sugars when digested with sulphuric acid; glucose, xylose, galactose and rhamnose have been identified in the hydrolysate which contains 34.5% fermentable sugars. (It can be used as a potential source of alcohol.)

In Kerala, *Saccharum arundinaceum* Retz. is used as Shara for dysuria, diseases due to vitiated blood, erysipelas, leucorrhoea and piles. The grass is known as Raamshara in North India. It can also be used for the production of furfural (yield 5.1% dry basis) and yields 24.1% of reducing sugars when

digested with sulphuric acid. The hydrolysate contains 65% of fermentable sugars, viz. glucose, xylose, galactose and rhamnose.

Dosage ▶ Root—20–50 g for decoction; 6–10 g powder. (*API*, Vol. III.)

Saccharum officinarum Linn.

Family ▶ *Gramineae; Poaceae*.

Habitat ▶ Uttar Pradesh, Bihar and Punjab.

English ▶ Sugarcane, Noble Cane.

Ayurvedic ▶ Ikshu, Dirgha-chhada, Bhuurirasa, Morata, Asipatra, Madhutrna, Gudamuula, Trnarasa.

Unani ▶ Gannaa, Naishakar.

Siddha/Tamil ▶ Karumbu, Nanal.

Action ▶ Cane Juice—restorative, cooling, laxative, demulcent, diuretic, antiseptic. Used in general debility, haemophilic conditions, jaundice and urinary diseases.

The Ayurvedic Pharmacopoeia of India recommends the juice of the stem in haemorrhagic diseases and anuria; and the root in dysuria.

Sugarcane juice contains sucrose (70–80% of soluble solids in the juice), glucose and fructose. Non-sugar constituents present in the cane juice are carbohydrates other than sugars. Asparagine and glutamine are prominent amino acids in the juice. Other

amino acids include alanine, gamma-amino butyric acid, aspartic and glutamic acids, glycine, leucine, lysine, serine and tyrosine. The presence of phenylalanine, histidine, valine, proline, threonine and arginine, pipercolic acid, methionine and tryptophan has also been reported.

Aconitic acid constitutes about three-fourths of the total carboxylic acid present in the juice.

Vitamins present in the juice are: thiamine, riboflavin, niacin, pantothenic acid, biotin, and vitamin D; enzymes include diastase, invertase, lactase, peroxidase, tyrosinase.

Phenols in the cane juice are mainly polyphenols from tannin and anthocyanin from the rind.

Cane juice contains glycolic acid which improves skin complexion as it has antiwrinkle effect, prevents scaly growth and increases natural collagen and elastin in the skin.

Enzymes present in the seeds include large quantities of diastase and invertase.

An ester, vanilloyl-1-O-beta-D-glucoside, has been isolated from the bagasse.

The leaves contain alpha-amylase and glutathione-S-transferase.

Dosage ▶ Stem—200–400 ml juice; rootstock—15–30 g for decoction. (API, Vol. IV.)

Saccharum spontaneum Linn.

Family ▶ *Gramineae; Poaceae*.

Habitat ▶ Throughout India.

English ▶ Thatch Grass.

Ayurvedic ▶ Kaasha, Kandekshu, Shvetachaamara.

Siddha/Tamil ▶ Naanal, Pai Karumbu.

Action ▶ Plant—cooling, astringent, diuretic, galactagogue. Used in the treatment of burning sensation, dysuria, dyscrasia, kidney and bladder stones, dysentery, bleeding piles. Root—diuretic, galactagogue.

Ayurvedic Pharmacopoeia of India recommends the root in calculus, dysuria and haemorrhagic diseases.

Dosage ▶ Root—3–6 g powder. (API, Vol. III.)

The Five-Grassroots (*Tripanchmulla*) of Ayurvedic medicine contain extracts of *S. munja*, *S. officinarum* and *S. spontaneum*. The compound is prescribed as a diuretic.

Saccolabium papillosum Lindl.

Family ▶ *Orchidace*.

Habitat ▶ The outer range of Himalayas from Uttar Pradesh eastwards to Sikkim and Assam.

Ayurvedic ▶ Naakuli (substitute), Vrksaadani (var.).

Folk ▶ Raasanaa, Naakuli, Gandhalataa.

Action ▶ Roots—used for rheumatism.

An alkaloid and a bitter resin has been reported in the plant.

Roots are used as a substitute for Sarsaparilla (*Hemidesmus indicus*).

Sagittaria trifolia Linn.

Synonym ▶ *S. sagittifolia*
Hook. f. (non L.)

Family ▶ *Alismataceae*.

Habitat ▶ Throughout the plains of India.

English ▶ Old world Arrowhead.

Folk ▶ Chhotaa Kuuta, Muyaa (Bengali).

Action ▶ Plant—discutient, anti-galactagogue, astringent, anti-inflammatory. Tuber—used for cutaneous diseases. Leaves—powder dusted in pruritus; mashed with molasses used in sore throat and inflammation of the breasts.

The plant contains a diterpene, sagitariol, beta-sitosterol, its glucoside and hentriacontanone. The diterpenes, trifoliones A, B, C and D, inhibited histamine release from rat mast cells.

The bulbs contain sandaracopimaric acid which suppressed the immune function of animal T-cells.

Salacia chinensis Linn.

Synonym ▶ *S. prinoides* DC.

Family ▶ *Hippocrateaceae; Celastraceae*.

Habitat ▶ A large, climbing shrub or small tree occurring throughout India, including the Andaman Islands.

English ▶ Saptrangi.

Ayurvedic ▶ Saptachakra, Swarnmuula, Saptarangi.

Folk ▶ Ingali (Maharashtra), Modhuphal (Bengal), Cherukuranti (Kerala).

Action ▶ Roots—used in diabetes. Also used for amenorrhoea, dysmenorrhoea and genito-urinary and venereal diseases.

The root bark contains proanthocyanidins, consisting of monomeric leucopelargonidin, its monomer, dimer and tetramer; triterpenoids (friedelin and its derivatives), mangiferine, phlobatannin, and glucosidal tannins.

The stem yielded gutta, dulcitol and proanthocyanidin consisting of dimer of leucopelargonidin.

Dosage ▶ Root—50–100 ml decoction. (CCRAS.)

Salacia macrosperma Wight.

Family ▶ *Hippocrateaceae; Celastraceae*.

Habitat ▶ The Western Ghats, from Konkan southwards.

Folk ▶ Lendaphala (Maharashtra), Anakoranti (Kerala).

Action ▶ Root—decoction is given after parturition. Leaves—applied to eczema.

A decoction of the roots of *S. grandiflora* Kurz, synonym *S. longifolia* Hook. (the Andamans) and *S. macrophylla* Blume, synonym *S. flavescens* Kurz and *S. ovalis* M. Laws. (Konkan and the Andamans) is also given after parturition.

Salacia oblonga

Wall. ex Wight & Arn.

- Family** ▶ *Hippocrateaceae*; *Celastraceae*.
- Habitat** ▶ Rain forests of Western Ghats from Konkan to Kerala.
- Folk** ▶ Chundan (Tamil Nadu), Ponkoranti (Kerala).
- Action** ▶ Root bark—used for the treatment rheumatism; also for gonorrhoea, swellings and skin diseases. Plant—mildly antiseptic.

Salacia reticulata Wt.

- Family** ▶ *Hippocrateaceae*; *Celastraceae*.
- Habitat** ▶ Orissa, Andhra Pradesh, Kerala.
- Folk** ▶ Ekanyakam, Koranti (Kerala, South India), Anukudu-chettu (Andhra Pradesh)
- Action** ▶ Plant—mild antiseptic. Root bark—used against gonorrhoea, skin diseases and inflammations. The root bark exhibits hypoglycaemic activity.

Salicornia brachiata Roxb.

- Family** ▶ *Chenopodiaceae*.
- Habitat** ▶ Sea coast from Bengal to Gujarat.
- Folk** ▶ Kohlu (Andhra Pradesh).
- Action** ▶ Ash—used in mange and itch.

Air-dried plant contains 8.97% ash; a high percentage of sodium and chloride ions (sodium 5.68, chloride 10.02%). The plant is a source of alkaline earth (called Sajji), used for extracting sodium carbonate.

Salix acmophylla Boiss.

- Family** ▶ *Salicaceae*.
- Habitat** ▶ Sub-Himalayan tracts from Uttar Pradesh westwards ascending to an altitude of 1,800 m.
- Ayurvedic** ▶ Jala-vetasa.
- Action** ▶ Bark—febrifuge.

Salix alba Linn.

- Family** ▶ *Salicaceae*.
- Habitat** ▶ North-western Himalayas, up to an altitude of 2,400 m.
- English** ▶ White Willow, European Willow.
- Ayurvedic** ▶ Jalavetasa.
- Unani** ▶ Bed Saadaa.
- Folk** ▶ Vivir (Kashmir).
- Action** ▶ Analgesic, anti-inflammatory, febrifuge. Used for rheumatic inflammation, painful muscles, spondylitis, lumbago, sciatica, neuralgia, gout and fever. (In 1838, chemists identified salicylic acid in the bark. Afterwards, synthesized it as acetylsalicylic acid, aspirin, in 1899.)
- Key application** ▶ In diseases accompanied by fever, headache,

rheumatic ailments. (*German Commission E.*) *The British Herbal Pharmacopoeia* reported anti-inflammatory action. The *British Herbal Compendium* additionally reported analgesic, antipyretic, antirheumatic and astringent actions of the willow bark.

The bark contains phenolic glycosides; salicin, picein and triandrin with esters of salicylic acid and salicyl alcohol, acetylated salicin, salicortin and salireposide; tannins; catechin; *p*-coumaric acid; flavonoids and polysaccharides.

Salicylic acid inhibits prostaglandin production, relieves pain and brings down fever.

Salix babylonica Linn.

Family ▶ *Salicaceae*.

Habitat ▶ North India, along the banks of rivers and water-courses.

English ▶ Weeping Willow.

Siddha/Tamil ▶ Aatru Paalai.

Folk ▶ Giur (Kashmir). Bed.

Action ▶ Leaves and bark— astringent, antipyretic. Used in intermittent and remittent fevers. Bark—anthelmintic. Biological activity of aerial part—antiviral, CNS active, hypothermic.

The leaves are reported to contain delphinidin and cyanidin, fragilin, salicin, salicortin, salidroside, tremuloidin, triandrin and vimalin. Salicin content in the stems and leaves is reported to be 3 to 4%. The bark yields

phenolics—triandrin, salicin, gallo catechol, catechol.

Salix caprea Linn.

Family ▶ *Salicaceae*.

Habitat ▶ Kashmir, Punjab, Himachal Pradesh and Uttar Pradesh.

English ▶ Sallow, Goat Willow, Common Willow.

Ayurvedic ▶ Vetasa, Vaanira, Vidula, Vanjula, Vaanjulaa. In Kerala *Homonoia riparia* Lour., *Euphorbiaceae*, is used as Vetasa or Jalavetasa.

Unani ▶ Bed Mushk.

Action ▶ Distilled water from flowers—cordial, stimulant; externally applied to headache. Stem and leaves— astringent. Leaves—decoc-tion used as febrifuge. Bark and twigs— astringent, applied to piles. Ash of wood—used in haemoptysis; mixed with vinegar, applied to piles.

Alkaloids, glycosides and saponins of male racemes increase the amplitude and slow the heartbeat and act more rapidly than digitalis on isolated frog heart.

Flavonoids present in the male racemes are: diometin, isorhamnetin, cap-reoside and salicaproside.

Phenol glycosides present in the bark are: delphinidin, cyanidin, piper-colic acid, fragilin, picein, salicin, salicortin, salireposide, triandrin and vimalin. Tannin content is reported to be 8–13%.

Salix daphnoides Vill. and *Salix elegans* Wall. (The Himalayas from Kash-

mir to Nepal) are also known as Jalavetasa.

Dosage ▶ Leaf, bark, root—50–100 ml decoction. (CCRAS.)

Salix fragilis Linn

Family ▶ Salicaceae.

Habitat ▶ Cultivated in Kashmir and Himachal Pradesh.

English ▶ Crack Willow, Kashmir Willow.

Folk ▶ Tilachaang (Himachal Pradesh).

Action ▶ Bark—antirheumatic.

Key application ▶ For relief of low back pain; symptomatic relief of mild osteoarthritic and rheumatic complaints. (ESCOP) The bark contains salicin 0.23%, salicase and tannin (6–12%).

The phenol glycosides reported from the plant include fragilin, glycosmin, grandidentatin, picein, populin, salicin, salireposide, salicyloyl tremuloidin, triandrin and tremuloidin.

Willow bark consists of the dried bark or twigs of various species of the genus *Salix*, including *S. purpurea* L. and *S. daphnoides* Vill.

Salicylate concentrations vary greatly among *Salix* sp. *Salix alba* bark is reported to contain 0.49–0.98% salicin; *Salix purpurea* bark 3–9%, *Salix daphnoides* bark 4.9–5.6% and *Salix fragilis* bark 3.9–10.2%. (Natural Medicines Comprehensive Database, 2007.)

Salix nigra Marsh.

Family ▶ Salicaceae.

Habitat ▶ Native to America (New York and Pennsylvania).

English ▶ Black Willow.

Unani ▶ Bed-Siyaah.

Action ▶ Astringent, febrifuge, sedative, nervine tonic. Anaphrodisiac (used for reducing sexual activity; in spermatorrhoea). Largely used in the treatment of nocturnal emissions.

The bark contains tannin, about 1% of glucoside salinigrin. Once considered a substitute for potassium bromide, but without a depressant effect.

Salix tetrasperma Roxb.

Family ▶ Salicaceae.

Habitat ▶ Throughout the greater part of India, along the banks of rivers and streams.

English ▶ Indian Willow.

Ayurvedic ▶ Jalavetasa, Naadeya, Niketan, Baishi.

Siddha/Tamil ▶ Attupalai.

Folk ▶ Vaanira, Vaalunja.

Action ▶ Dried leaves—anti-inflammatory, given in rheumatism, swellings, piles. Bark—febrifuge.

The bark is reported to contain 6.5% tannin, also salicin A.

Salix viminalis Linn. (The Himalayas from Kashmir to Sikkim) is known as Basket Willow and the Osier.

The bark contains 8.2%–8.8% tannin and phenol glycosides, fragilin, picein, salicin (0.13%), salicortin, salireposide, triandrin and vimalin. Salicase, and calcium and potassium nitrates are also reported from the bark.

Dosage ▶ Bark—59–100 ml decoction. (CCRAS.)

Salmalia malabarica (DC) Schott & Endl.

Synonym ▶ *Bombax ceiba* Linn.
Bombax malabaricum DC.
Gossampinus malabarica (DC.)
Merr.

Family ▶ *Bombacaceae*.

Habitat ▶ The hotter parts of India, up to 1,350 m.

Ayurvedic ▶ Shaalmali, Mochaa, Mochaahva, Pichhila, Raktapushpa, Sthiraayu, Kankataadhya, Tuulini. Shaalmali-veshtaka (gum).

Unani ▶ Semal. Mochras (gum).

Siddha ▶ Mul Ilavam. Ielavampisin (gum).

Folk ▶ Semar.

Action ▶ Young roots (Semulmusali)—astringent, (used for dysentery) stimulant, demulcent. Fruits—stimulant, diuretic, expectorant. Used for chronic inflammation of bladder, kidney also for calculus affections. Flowers— astringent and cooling, applied to cutaneous affections. Leaves— anti-inflammatory. Stem bark— demulcent, styptic. Aqueous extract

with curd is given for blood-dysentery. Bark—paste is applied to skin eruptions, boils, acne, pimples. Seeds used for chickenpox, smallpox, catarrhal affections, chronic cystitis and genitourinary diseases. Gum—astringent, demulcent, styptic. Used for diarrhoea, dysentery, haemoptysis, bleeding piles, menorrhagia, spermatorrhoea. Root and pod—used for the treatment of low vitality and debility.

The Ayurvedic Pharmacopoeia of India recommends the stem bark in bleeding disorders and in acne vulgaris.

All parts of the plant gave beta-sitosterol and its glucosides; seeds, bark and root bark, lupeol; flowers, hentriacontane, hentriacontanol; root bark, in addition, gave 7-hydroxycadalene. The seed oil yields arachidic, linoleic, myristic, oleic and palmitic acids; seeds contain carotenes, *n*-hexacosanol, ethylgallate and tocopherols; the gum contains gallic and tannic acids, yields L-arbinose, D-galactose, D-galacturonic acid and D-galactopyranose.

Younger roots contain more sugars (arabinose and galactose 8.2%) and peptic substances (6.0%) than the older ones. They contain mucilage, starch (71.2%), mineral matter (2.1%), tannins 0.4 and non-tannins 0.1%, along with other constituents.

The Musali compares favourably with the nutritive value of *Pueraria tuberosa*, *Dioscorea bulbifera*, *Ipomoea digitata* and *Butea monosperma* (all used in sexual debility).

A related species, *Salmalia insignis* (Wall.) Schott & Endl., synonym

Bombax insigne Wall. (Assam, Western Ghats and the Andamans); is known as Semul; Dumboil (Assam), Didu (Andamans) and Kal-ilavu (Tamil Nadu).

Dosage ▶ Stem bark—5–10 g powder. (API, Vol. III.) Flower, bark root—3–5 g powder. (CCRAS.)

Salsola kali Linn.

Family ▶ *Chenopodiaceae*.

Habitat ▶ North-West Himalayas and Kashmir.

English ▶ Glass-Wort, Russian Thistle, Prickly-Saltwort.

Ayurvedic ▶ Sarjikka, Katol, Laanaabuuti, Sajji-buuti.

Unani ▶ Ushnaan, Ghaajuraan.

Folk ▶ Barilla.

Action ▶ Plant—cathartic. Juice of fresh plant and seed-vessels—a potent diuretic. Ash of the plant is used in Unani medicine.

Alcoholic extract of the plant showed antimicrobial activity against *Salmonella paratyphi* and *Serratia marcescens*.

Salvadora oleoides Dcne.

Family ▶ *Salvadoraceae*.

Habitat ▶ The arid regions of Punjab, Rajasthan and western India.

Ayurvedic ▶ Pilu (bigger var.).

Siddha ▶ Kalawa (Tamil).

Action ▶ Leaf—bechic. Bark—vesicant. Fruit—febrifuge (in low fever), used in enlarged spleen. Oil from seed—applied in rheumatic affections and after child birth.

The fruit contains sterols, beta-sitosterol and its glucosides and stigmasterol; benzylisothiocyanate, *n*-octacosanol and tetracosane; flavonoids including quercetin and rutin; thiourea derivatives and phospholipids. Myristic, lauric and palmitic acids were obtained from the seed fat.

Salvadora persica Linn.

Synonym ▶ *S. persica* L. var. *wightiana* Verde.
S. indica Wt.

Family ▶ *Salvadoraceae*.

Habitat ▶ Arid regions, on saline lands and in coastal regions.

English ▶ Mustard tree. Salt Bush tree, Tooth Brush tree.

Ayurvedic ▶ Pilu (smaller var.), Pilukaa, Sransi, Angaahva, Tikshnavrksha.

Unani ▶ Miswaak, Araak.

Siddha ▶ Perungoli.

Action ▶ Fruit—carminative (used in biliousness), deobstruent (used for rheumatism, tumours, splenomegaly), diuretic, lithotriptic. Leaves—decoction used for cough and asthma, poultice in painful piles and tumours; juice in scurvy. Flowers—stimulant, laxative. Applied in painful rheumatic conditions. Seeds—diuretic; purgative; fatty

oil applied locally on rheumatic swellings. Root bark—topically vesicant. Bark—emmenagogue, ascarifuge, febrifuge. Biological activity of stem bark—spasmodic. Plant—anti-inflammatory, hypoglycaemic, antibacterial.

The root gave elemental gamma-monoclinic sulphur, benzyl glucosinolate, salvadourea (a urea derivative), *m*-anisic acid and sitosterol. Benzyl isothiocyanate, isolated from the root, exhibits antiviral activity against *Herpes simplex virus-1* which affects oral region. (The root is used in many parts of the world as a tooth brush.) Root bark and stem bark contain trimethylamine. Myristic, lauric and palmitic acids are the major acid components of the seed fat.

Dosage ► Fruit—3–6 g powder; 50–100 ml decoction. (CCRAS.)

Salvia aegyptiaca Linn.

Synonym ► *S. pumila* Benth.

Family ► *Labiatae; Lamiaceae*.

Habitat ► Arid areas from Delhi westwards in Punjab and Rajasthan, and southwards in Gujarat and Maharashtra.

Unani ► Tukhm-Malangaa.

Action ► Seeds—used for diarrhoea, also in haemorrhoids.

Seeds yield mucilage and a gum which contain aldobiuronic acid and aldotriouronic acid.

The mucilage on hydrolysis yields D-galactose, L-arabinose, L-rhamnose and galacturonic acid.

The seeds of this plant are often confused with those of *Lallemantia royleana* Benth. which are also sold as Tukhm-Malangaa.

Salvia coccinea Linn.

Family ► *Labiatae; Lamiaceae*.

Habitat ► Cultivated in Indian gardens.

Ayurvedic ► Samudrashosha (var.).

English ► Red Sage, Texas Sage.

Action ► Decoction—used in renal diseases, also for lumbago. Contraindicated during pregnancy.

Salvia haematodes Linn.

Family ► *Labiatae; Lamiaceae*.

Habitat ► Cultivated in Indian gardens.

English ► Blood-veined Sage.

Unani ► Behman Surkh. (Behman Safed is equated with *Centaurea behen* Linn.)

Action ► Both the varieties of Behman are used in Unani medicine as a cardiac and sex tonic, also as a liver tonic in jaundice.

Salvia lanata Roxb.

Family ► *Labiatae; Lamiaceae*.

Habitat ► The temperate Himalayas from Kashmir to Nepal

Folk ► Kuuthan-Kali.

Action ▶ Roots—an adulterant of *Saussurea lappa*. Used as a substitute for *Saliva moorcroftiana*.

Salvia moorcroftiana

Wall. ex Benth.

Family ▶ *Labiatae; Lamiaceae*.

Habitat ▶ Northwestern Himalayas from Kashmir to Kumaon at 2,000–3,000 m.

Folk ▶ Kaali-jarri (Punjab).

Action ▶ Root—bechic. Leaves—antitussive; applied as poultice to boils and chronic skin affections. Seeds—antispasmodic, emetic. Used for colic, dysentery, also for haemorrhoids; applied to boils.

The root gave a diterpene quinone.

Salvia officinalis

Linn.

Family ▶ *Labiatae; Lamiaceae*.

Habitat ▶ Native to the Mediterranean region; grown as an ornamental.

English ▶ Sage.

Folk ▶ Salvia Sefakuss.

Action ▶ Plant—astrigent, anti-inflammatory, carminative, antispasmodic, antiseptic. Leaf and flower—cholagogue, hypoglycaemic, antiasthmatic (used for respiratory allergy), cholagogue, emmenagogue, antisudoriferous, antiseptic. Leaf—diaphoretic, antipyretic. Used for sore throat, laryngitis, tonsillitis, stomatitis.

Key application ▶ Leaf—internally, for dyspeptic symptoms and excessive perspiration; externally for inflammations of the mucous membranes of nose and throat. (*German Commission E.*) ESCOP indicates its use for inflammations and infections such as stomatitis, gingivitis, pharyngitis, and hyperhidrosis.

The leaves contain a volatile oil; diterpene bitters including carnosolic acid; flavonoids including salvigenin, genkwanin, hispidulin, luteolin and its derivatives; phenolic acids including rosmarinic, caffeic, labiatic; a condensed catechin, salvia tannin.

The roots contain diterpene quinones royleanone and its derivatives. Volatile oil contains alpha- and beta-thujone, 1,8-cineole and camphor. Thujone is strongly antiseptic and carminative, also has an oestrogenic action that is partly responsible for the herb's hormonal activity in reducing breast milk production. The volatile oil also relieves muscle spasms. Rosmarinic acid, a phenol, allays inflammations.

Cirsiliol, linalool and alpha-terpineol, constituents of the volatile oil, exhibit CNS depressant activities.

In a double blind, randomized and placebo controlled trial, extracts of *Salvia officinalis* showed improvement in patients with mild to moderate Alzheimer disease. (*Natural Medicines Comprehensive Database*, 2007.)

Sage oil is used in perfumes as a deodorant and for the treatment of thrush and gingivitis. The herb is used in tooth powders, mouth washes, gargles,

poultices, hair tonics and hair dressings.

Salvia plebeia R. Br.

Family ► *Labiatae; Lamiaceae.*

Habitat ► Throughout the plains of India, up to 1,500 m in the hills.

Ayurvedic ► Samudrashosha, Kammarkasa.

Folk ► Bhuu-Tulasi.

Action ► Plant—diuretic, antelmintic, astringent, demulcent. Leaves—used for toothache. Seeds—mucilaginous, used for diarrhoea, leucorrhoea, menorrhagia and haemorrhoids.

The plant contains flavones—nepetin and hispidulin and their glucosides. Flowers also contain nepetin. Sitosterol and oleanolic acid are also present. The seeds yield secoisolariciresinol diester.

Salvia spinosa Linn.

Family ► *Labiatae; Lamiaceae.*

Habitat ► Native of Baluchistan. (Used in Unani medicine.)

Unani ► Kanochaa, Marv. Seeds—Tukhm Kanochaa, Tukhm Marv. (*National Formulary of Unani Medicine* equated Kanochaa with *Phyllanthus maderaspatensis* Linn.)

Action ► Used for colic and as an intestinal tonic, deobstruent and disinfectant. Roasted or processed seeds are prescribed in diarrhoea and dysentery.

Salvinia cucullata Roxb.

Family ► *Salviniaceae; Azollaceae.*

Habitat ► Throughout India in shallow, freshwater lakes, ponds, ditches.

Ayurvedic ► Aakhukarni (Kerala). (Suggested by Rashtriya Ayurveda Vidyapeeth.)

Action ► Root—digestive, diuretic, febrifuge, anthelmintic. Used for epistaxis, fever and colic. Also for dysuria, polyuria and skin diseases.

In Kerala, *Merremia emarginata* (*Convolvulaceae*) or *Hemionitis arifolia* (*Cheilantheaceae*) are used as Aakhukarni.

Salvinia is an aquatic fern, rich in protein, minerals, chlorophyll and carotenoids. Its extract exhibited strong antifungal activity against *Fusarium nivale*.

Sambucus ebulus Linn.

Synonym ► *S. wightiana* Wall. ex W. & A.

Family ► *Caprifoliaceae.*

Habitat ► Kashmir at 2,000–3,600 m.

English ► Dwarf Elder.

Unani ► Khamaan Saghir, Khamaan-ul-Arzaa, (Nabli) Khamaan.

Siddha/Tamil ► Mushkiyaara (Punjab), Khamman, Ganhulaa.

Action ► Diuretic, expectorant. Used for kidney and bladder torpor.

Lipid fraction of drupes contains unsaturated fatty acids, sterols, aliphatic alcohols, triterpenic alcohols, alpha- and beta-amyrin; also anthocyanin pigments, phenolic acids. The root contains beta-sitosterol and alpha-amyrin. Aqueous extracts induced diuresis in rats and exhibited hypotensive activity in cats. The extract of flowering herb showed significant anti-ulcerogenic activity.

Sambucus nigra Linn.

Family ▶ *Caprifoliaceae*.

Habitat ▶ Kangra and in Simla hills.

English ▶ European Elder, Black Elder.

Unani ▶ Khamaan Kabir.

Action ▶ Anti-inflammatory, anticatarrhal, diuretic. Flowers and berries—used for common cold, influenza, nasal catarrh, sinusitis; as a gargle in sore throat. Inner bark—cathartic, hydragogue, emetic, diuretic. Infusion of bark and flowers—given in epilepsy; also used as a gentle circulatory stimulant, diaphoretic, expectant and anticatarrhal; locally in inflammations.

Key application ▶ In colds, also as a diaphoretic and anticatarrhal. (*German Commission E, The British Herbal Compendium, WHO.*)

The flowers contain triterpenes including ursolic acid; flavonoids (up to 3%) including rutin; phenolic acids; triterpenes; sterols; tannins; mucilage; volatile oil (up to 0.2%); leaves gave

cyanogenic glycosides; berries contain flavonoids, anthocyanins, vitamin A and C.

Anti-inflammatory activity of the flowers has been attributed to ursolic acid. Elder flowers and peppermint is an old remedy for influenza in the Western herbal.

The berry is used against influenza virus A and B. (*J Alt Compliment Med*, 1(4), 1995.)

Sandoricum indicum Cav.

Synonym ▶ *S. koetjape* (Burm. f.) Merrill.

Family ▶ *Meliaceae*.

Habitat ▶ Wild in Kangra and in Simla hills.

English ▶ European Elder.

Siddha/Tamil ▶ Sevai, Sayai.

Action ▶ Root—astrigent, carminative, antispasmodic. Used for diarrhoea. Bark—anthelmintic.

Fruit hulls gave bryonic and bryonic acids, mesoinosital and dimethyl mucate; heartwood also gave triterpenic acids including katonic and indicic acid.

The seeds gave limonoids—sandoricin and 6-hydroxysandoricin. A secotriterpene, koetjapic acid, together with katonic acid, has been isolated from the stem. Sandoricin and 6-hydroxysandoricin exhibited effective antifeedant activity. Katonic acid exhibited significant cytotoxicity against a variety of cultured human cancer cells.

Sanicula europaea Linn.

Family ▶ *Umbelliferae*.

Habitat ▶ Europe, including Britain. The Himalayas from Kashmir to Bhutan, Assam, Western Ghats and Palni hills in South India.

English ▶ Wood Sanicle.

Action ▶ Plant—astringent, alterative, vulnerary. Used in leucorrhoea, menorrhagia, bleeding piles; also in diarrhoea and dysentery. The herb is also employed as an ingredient of an ointment used for septic ulcers.

The herb contains saponins based on saniculogenins; allantoin; chlorogenic and rosmarinic acids. The flowers contain 3.1 and fruits 1.1% rosmarinic acid. The leaves contain 0.6% chlorogenic acid. The roots contain 23.1, leaves 12.8, flowers 6.0 and fruits 5.2% sucrose. Rhizome contains chlorogenic acid 1.2 and sucrose 13.9%.

Sansevieria hyacinthoides (Linn.) Druce.

Synonym ▶ *S. zeylanica* (L.) Willd.

Family ▶ *Liliaceae*.

Habitat ▶ Native to Sri Lanka; found along coastal regions of India from Bengal to Tamil Nadu.

English ▶ Ceylon Bowstring Hemp.

Ayurvedic ▶ Naagadamani (related species) (also known as Muurvaa).

Siddha/Tamil ▶ Marul, Motta manji.

Action ▶ See *S. roxburghiana*. Leaves and rhizomes are applied externally in high fever with delirium.

Rhizomes—diuretic, diaphoretic, expectorant.

The leaf contains aconitic acid; the root yielded an alkaloid sansevierine (0.018%).

Sansevieria roxburghiana

J. & J. Schultes

Synonym ▶ *S. zeylanica* auct. non-(L.) Willd.

Family ▶ *Liliaceae*.

Habitat ▶ The eastern coast of India from West Bengal to Tamil Nadu in South.

English ▶ Indian Bowstring Hemp.

Ayurvedic ▶ Naagadamani, Takshaki. Used in West Bengal as a substitute for Muurvaa.

Siddha ▶ Marul, Motta Manji (Tamil).

Action ▶ Rhizomes—mucilaginous, used for cough. Tender shoots—juice given to children for clearing phlegm from the throat. Whole plant—finds application in glandular enlargement and rheumatism.

Care must be taken that the herb does not accumulate in the system.

The plant must not be confused with Indian Hemp (*Cannabis indica*).

Santalum album Linn.

Family ▶ *Santalaceae*.

Habitat ▶ Dry regions of Peninsular India from Vindhya mountains

southwards, especially in Karnataka and Tamil Nadu.

English ▶ White Sandalwood.

Ayurvedic ▶ Chandana, Shvetachandana, Shrikhanda, Bhadra-Shree, Gandhsaara, Malayaja, Hima, Ekaangi.

Unani ▶ Sandal Safed, Sandal-e-Abyaz.

Siddha/Tamil ▶ Chandanam, Sandana, Ingam.

Action ▶ Cooling, diaphoretic, diuretic, expectorant, antiseptic and bacteriostatic against Gram positive bacteria. Used as a urinary antiseptic in chronic cystitis and sexually transmitted diseases. A paste is applied to temples in headache, during fevers and on burns, local inflammations and skin diseases (to allay pruritus). Essential oil—antibacterial, antifungal. Used as urinary antiseptic in dysuria, urethral discharges and diseases of gallbladder.

Key application ▶ In adjuvant therapy of infections of the lower urinary tract. Contraindicated in the diseases of the parenchyma of the kidney. (*German Commission E.*)

The bark contains a triterpene—*urs-12-en-3* butyl-palmitate. Chief constituents of the essential oil from heartwood are alpha- and beta-santalol. Other constituents include sesquiterpene hydrocarbons—alpha-, beta-, *epi*-beta-santalene and alpha- and beta-curcumene and beta-farnesene. Dihydroagarofuran is also present in the essential oil.

Dosage ▶ Heartwood—3–6 g powder. (*API*, Vol. III.)

Santolina chamaecyparissus Linn.

Family ▶ *Compositae*.

Habitat ▶ Mediterranean region. Grown as an ornamental on the hills of South India.

English ▶ Lavender Cotton.

Action ▶ Plant—stomachic, antispasmodic, vermifuge, emmenagogue, analgesic, anti-inflammatory.

The herb contains flavonoids, particularly 6-methoxy flavones; pectolinarigenin, hispidulin, nepetin and an essential oil.

The extract of flowers, leaves and roots of the plant are reported to be active against Gram-positive bacteria. Anti-inflammatory effects of the herb were demonstrated in rats without ulcerogenicity or toxicity. (*Planta Medica*, 6, 1986.)

Sapindus laurifolius Vahl.

Synonym ▶ *S. trifoliatus* auct. non Linn.

Family ▶ *Sapindaceae*.

Habitat ▶ South India; also cultivated around villages in Madhya Pradesh, Uttar Pradesh, Bihar and West Bengal.

English ▶ Soapnut tree of South India.

Ayurvedic ▶ Arishtaka, Phenila, Raktabeeja, Reethaakaranja, Garbhapaatana.

Unani ▶ Reethaa.

Siddha/Tamil ▶ Puvamkottai, Manipungu.

Action ▶ Fruit—astrigent, emetic, detergent, anthelmintic. Pulp—aqueous solution used as nasal drops in migraine, epilepsy and hysteria. Root—used for gout, rheumatism and paralysis.

Saponin from pericarp of nuts yielded the genins, methylhedragenate, sapindic acid and methyl oleanolate.

Dosage ▶ Fruit—3–6 g powder. (CCRAS.)

Sapindus mukorossi Gaertn.

Family ▶ *Sapindaceae*.

Habitat ▶ Native to China and Japan; distributed in the Himalayas from Himachal Pradesh eastwards and in Assam.

English ▶ Chinese Soap Berry, Soap Nut tree of North India.

Ayurvedic ▶ Arishtaka, Phenila.

Folk ▶ Reethaa.

Action ▶ Fruits—emetic and expectorant; used in excessive salivation, chlorosis and epilepsy. The plant yielded triterpenoid glycosides, sapindosides, derived from hederagenin. Saponins exhibit hypotensive, anticholesterolemic, spermicidal and antimicrobial properties.

Saponin A and C sapindoside A and B, extracted from the fruit rind, showed antifungal activity. Hederagenin, isolated from the fruit rind or pericarp, is used in skin-lightening and anti-inflammatory cosmetics.

Other constituents from the plant are flavonoids—quercetin, kaempferol, apigenin and rutin.

Sapium indicum Willd.

Family ▶ *Euphorbiaceae*.

Habitat ▶ Moist parts of India, especially along sea-coasts and back waters.

Siddha/Tamil ▶ Pencolum.

Folk ▶ Hurnaa (Maharashtra).

Action ▶ Root bark—emetic, acrid and purgative.

The fruit contains aesculetin. A lactone and an alcohol has been isolated from the bark.

Sapium sebiferum Roxb.

Family ▶ *Euphorbiaceae*.

Habitat ▶ Native to China; introduced at various elevations in northern India, chiefly on ravine lands in the foothills. Planted throughout India as ornament.

English ▶ Chinese Tallow tree.

Folk ▶ Tayapippali, Vilaayati Shisham, Mom-China.

Action ▶ Seed oil—vulnerary, emetic, purgative; used for skin diseases and for promoting healing of wounds.

Leaves latex—vesicant. Bark—a decoction is given in dyspepsia. Resin—purgative.

Chinese vegetable tallow (of low iod. val.) is obtained from waxy mass covering the seed; the Stillingia Oil (of high iod. val.) from the kernel. The tallow from Indian trees contains 62.3% palmitic and 27.4% oleic acid. A related species, *S. discolor* Muell-Arg., introduced into the Lal Bagh Gardens, Bangalore, yields a tallow containing comparatively more oleic and less palmitic acids. Stillingia Oil is considered superior to linseed oil. The oil contains lauric, myristic, oleic, palmitic and stearic acids; the leaves contain ellagic and gallic acids, isoquercitrin and tannin 5.5%.

Ethanol extract of powdered root bark yielded 0.1% phloroacetophenone 2,4-dimethylether and menthol extract gave xanthoxyline. The bark also contains moretenone, moretenol and a triptene, 3-*epi*-moretenol.

S

Saponaria officinalis Linn.

Family ▶ *Caryophyllaceae*.

Habitat ▶ Native to temperate region of Europe; introduced in Indian gardens.

English ▶ Bouncing Bet, Soapwort.

Action ▶ Roots—blood purifier, cholagogue, expectorant, diuretic, diaphoretic. Roots and leaves—used for scrofula and skin diseases. Sap used as a depurative for scabies, furuncles, hepatic eruptions and venereal ulcers (as a lotion). Plant—employed for jaundice (to increase

bile flow); also in respiratory disorders (bronchitis, sore throat).

Key application ▶ Root—in catarrhs of the upper respiratory tract. (*German Commission E.*)

The plant contains saponin, sapotoxin and saponarin. The root contains sapotoxin (4–5%) and saporubric acid. Saponin content of the root is highest (7.7–8.2%) just before flowering stage and the lowest (about 3%) during the flowering period. The bark yield 0.8% of saponin. The leaves contain saponarin. Youngest leaves show the highest haemolytic activity.

Aqueous extract of the plant exhibit antibacterial activity.

Saponaria vaccaria Linn.

Family ▶ *Caryophyllaceae*.

Habitat ▶ Throughout India as a weed of cultivated fields of wheat and barley. Also cultivated in gardens for ornament.

Folk ▶ Musna, Saabuni.

Action ▶ See *S. officinalis*. The mucilaginous sap of the plant is febrifugal and used in chronic fevers. It is a mild depurative and used in the treatment of furuncles and scabies.

Saprosma ternatum

Benth. & Hk. f. in part.

Family ▶ *Rubiaceae*.

Habitat ▶ Hills of Assam, in damp places and in the Andamans.

Folk ▶ Bhedeli (Assam).

Action ▶ Leaf—carminative, eaten to relieve flatulence and stomachache. A poultice is used after parturition.

Saraca asoca (Roxb.) De Wilde.

Synonym ▶ *S. indica* auct. non L.

Family ▶ *Caesalpinaceae*.

Habitat ▶ Throughout India, except Northwestern India, up to 750 m.

English ▶ Ashoka tree.

Ayurvedic ▶ Ashoka, Ashoku, Hempushpa, Taamrapallava, Pindapushpa, Gandhapushpa. (*Polyalthia longifolia* Benth. & Hook. f., an ornamental roadside tree, is wrongly called Ashoka.)

Unani ▶ Ashoka.

Siddha/Tamil ▶ Asogam.

Action ▶ Bark—uterine tonic (imparts healthy tone to uterus), used for suppressed menses, leucorrhoea, menstrual pain, menorrhagia, complaints of menopause. Also used for dyspepsia, biliousness, colic, burning sensation. Flowers—pounded and mixed with water, used in haemorrhagic dysentery, bleeding piles and retention of urine.

The Ayurvedic Pharmacopoeia of India recommends the bark in metrohagia, menorrhagia, chronic lymphadenitis and inflammations.

The flowers contain fatty acids and gallic acid; apigenin-7-O-beta-D-glucoside, cyanidin-3,5-diglucoside, kaempferol 3-O-beta-D-glucoside, perylarginidin-3,5-diglucoside, quercetin

and its 3-O-beta-D-glucoside and sitosterol.

The bark yields alkanes, esters and primary alcohols. It gave *n*-octacosanol, tannin (6%), catechin, (+)-catechol, (-)-epicatechin, (-)-epicatechol, leucocyanidin, leucopelargonidin, procyanidin derivatives, methyl- and ethylcholesterol derivatives.

Quercetin and its 3-O-rhamnoside, kaempferol-3-O-alpha-L-rhamnoside, amyirin, ceryl alcohol and beta-sitosterol have been isolated from leaves and stems.

Alcoholic extract of the bark is reported to be active against a wide range of bacteria. The aqueous extract has been found to enhance the life span of mice infected with Ehrlich ascites carcinoma by 24%.

Pure phenolic glucoside (P2), isolated from stem bark, exhibited highly potent oxytocic activity on different mammals and was similar in nature to pitocin and ergometrine.

Dosage ▶ Dried stem bark—20–30 g for decoction. (*API*, Vol. I.)

Sarcococca saligna

(D. Don) Muell.-Arg.

Synonym ▶ *S. pruniformis* Hook. f. *S. trinervia* Wt.

Family ▶ *Buxaceae*.

Habitat ▶ The Himalayas and the hills of North-eastern India up to 2,700 m.

Folk ▶ Geru (Garhwal, Patiala), Tiliari (Jaunsar), Sukatsing (Kumaon).

Action ▶ Leaves—used in the treatment of rheumatism and fever.

The leaves contain steroidal alkaloids, including saracosine, saracodine and saracodinine; also betulin.

Aerial parts exhibit spasmolytic, diuretic and anti-inflammatory activity. Steroidal alkaloids induce non-recoverable fall in blood pressure in dogs.

Sarcostemma brevistigma

W. & A.

Synonym ▶ *S. acidum* Voigt.

Family ▶ *Asclepiadaceae*.

Habitat ▶ Dry places in West Bengal, Bihar and Peninsular India.

English ▶ Moon Plant, Soma Plant.

Ayurvedic ▶ Somavalli, Somalataa, Somakshiri, Saumyaa, Dwijpriyaa. (Not to be confused with Soma of the Vedas.) (Substitute: *Ephedra gerardiana*.)

Siddha/Tamil ▶ Somamum, Kodi-Kalli.

Action ▶ Dried stems—emetic. Plant—insecticidal.

The plant contains malic acid, succinic acid, reducing sugar, surcosa, traces of tannin, an alkaloid, a phytosterol, alpha- and beta-amyrins, lupeol and lupeol acetate and beta-sitosterol. The milky exudate from the stem contains 4.1% of caoutchouc. Coagulum contains: caoutchouc 16, resins 68.1 and insolubles 15.9%.

Related species, *Sarcostemma brunonianum* W. & A. (South India),

known as Perumaattaaan kodi in Tamil Nadu; *S. intermedium* Decne (Peninsular India), and *S. stocksii* Hk. f. (Peninsular India), are also said to have similar uses as those of *S. acidum*.

Sarcostemma secamone (L.) Bennet, synonym *S. esculentum* (L. f.) Holm. (throughout the plains in semi marshy places) is known as Dughdhikaa or Duudhilataa in Northern India and Usippalai in Tamil Nadu. Whole plant is depurative, galactagogue and antiseptic (used as a gargle in sore throat and stomatitis; fresh root is prescribed in jaundice. A pregnane triglycoside, esculentin and cardenolide tetraglycosides have been isolated from the root.

Dosage ▶ Milky exudate from stem—1–3 drops. (CCRAS.)

Sarcostigma kleinii W. & A.

Family ▶ *Icacinaceae*.

Habitat ▶ The Western Ghats, from Konkan southwards.

Ayurvedic ▶ Ingudi. (*Balanites aegyptiaca* is also equated with Ingudi.)

Siddha ▶ Odal (Tamil).

Action ▶ Seed oil—used externally in rheumatism. Powdered bark—given in rheumatism, neurological disorders and skin diseases.

Sassafras albidum (Nutt.) Nees.

Synonym ▶ *S. officinale* Nees and Eberm.
S. variifolium Kuntze.

Family ▶ *Lauraceae*.

Habitat ▶ Canada to Florida. Dried roots of *S. albidum* are imported into India.

English ▶ Ague tree.

Unani ▶ Sassafras.

Action ▶ Root—used earlier for rheumatism, gout, kidney complaints and skin diseases.

Safrole is the main constituent of the volatile oil (80–90%), in addition to condensed tannins, resin, cinnamic acid derivatives. Safrole and its metabolite, L-hydroxysafrole are both neuro- and hepatotoxic (carcinogenic in animals). Its internal use is no more advised. Safrole-free extracts are ineffective.

Satureja hortensis Linn.

Family ▶ *Labiatae; Lamiaceae*.

Habitat ▶ Native to Mediterranean region; found in Kashmir.

English ▶ Summer Savory. Winter Savory is equated with *S. montana* L.

Action ▶ Flowering top—carminative, digestive, laxative, stomachic, diuretic, sudorific and vermifuge. Used in flatulent colic and menstrual suppression. A tea (of leaves) is given as a carminative and expectorant. Essential oil—antibacterial, antifungal, spasmolytic.

The plant gave fluorine, labiatic acid, ursolic acid and beta-sitosterol. Labiatic acid is antioxidant. The volatile

oil consists mainly of carvacrol with *p*-cymene, beta-pinene, beta-phellandrene, limonene and borneol.

The volatile oil of *S. montana* contains carvacrol, *p*-cymene and thymol with alpha- and beta-pinene, cineole and borneol.

Sauropus androgynus Merrill.

Family ▶ *Euphorbiaceae*.

Habitat ▶ Sikkim, Khasi Hills and Western Ghats, and also grown in South India.

English ▶ Star Goose Berry.

Siddha/Tamil ▶ Thavasai Murungai.

Action ▶ Plant—known as Multi-vitamin Green for its substantial vitamin content. Decoction is given in stricture of the bladder and in fevers; used as a diuretic.

The leaves contain protein 6.8; carbohydrates 11.6; mineral matter 3.4, Ca 0.57, phosphorus 0.20, iron 28.0 mg, carotene (as vitamin A), 9,510 IU, thiamine 0.48, riboflavin 0.32, nicotinic acid 2.6, and vitamin C 247 mg/100 g.

Saussurea affinis Spreng. ex DC.

Family ▶ *Compositae; Asteraceae*.

Habitat ▶ Foot Hills of Eastern Himalayas and in Aka and Laushai Hills.

Folk ▶ Ganga-muula (Assam).

Action ▶ Root—juice is prescribed in gynaecological diseases.

Saussurea gossypiphora D. Don.

Family ▶ *Compositae, Asteraceae.*

Habitat ▶ Himalayas from Garhwal to Sikkim at 4,200–5,100 m.

Folk ▶ Phen-kamal, Jogi Paashaa, Hiyun Kauni.

Action ▶ Plant, root—a decoction is prescribed in gynaecological diseases.

The plant afforded beta-sitosterol, 3-stigmastanol, stigmast-7-en-3-ol and ergostan-3,24-diol. The aerial parts of the plant collected from Himalayas gave heptacosane, hentriacontane, nonacosane, alpha- and beta-amyrins and their acetates and palmitates, lupeol, its acetate, fructose, glucose and sucrose.

Saussurea heteromalla

(D. Don) Raizada & Saxena.

Synonym ▶ *S. candicans* C. B. Clarke.
Carduus heteromallus D. Don.

Family ▶ *Compositae, Asteraceae.*

Folk ▶ Batula, Kaaliziri (Punjab).

Action ▶ Leaves—antiseptic; applied to wounds. Seeds—carminative. The plant exhibits CNS depressant and hypothermic properties.

Saussurea hieracioides Hook. f (Sikkim Himalayas at 3,600–4,200 m) gave a sesquigignan, saussol; scopoletin, luteolin-7-O-beta-D-glucoside and syringin were isolated from the aerial parts.

Saussurea hypoleuca spreng.

Synonym ▶ *S. auriculata* (DC.) Sch.-Bip.

Aplotaxis auriculata DC.

Family ▶ *Compositae; Asteraceae.*

Habitat ▶ The Himalayas from Kashmir to Sikkim.

Ayurvedic ▶ Kushtha (pseudo).

Folk ▶ Uplet (Maharashtra).

Action ▶ Leaves—used in the treatment of syphilis.

The root of the plant is found mixed with the root of Kushtha of Indian medicine.

Saussurea lappa

(Decne) Sch.-Bip.

Synonym ▶ *S. costus* (Falc.) Lipsch.

Family ▶ *Compositae; Asteraceae.*

Habitat ▶ Kashmir, Himachal Pradesh and Garhwal at 2500–3,000 m; cultivated in Kashmir and neighbouring regions.

English ▶ Kuth, Costus.

Ayurvedic ▶ Kushtha, Kusht, Vaapya, Kaashmira, Gada, Rug, Ruk, Aamaya, Paalaka. (Substitute: Pushkara Muula, *Inula racemosa*.)

Unani ▶ Qust.

Siddha/Tamil ▶ Kostum, Kottam.

Folk ▶ Sugandha-Kuutth.

Action ▶ Root—antispasmodic, expectorant, carminative, astringent, antiseptic. An ingredient of prescriptions for dyspepsia, asthma,

cough, chronic rheumatism, skin diseases. Applied locally to wounds and ulcerations. Powdered root, mixed with mustard oil, is applied to scalp in prurigo.

The Ayurvedic Pharmacopoeia of India recommends the root in cough, bronchitis, dyspnoea; erysipelas and gout.

The root (containing both the essential oil and alkaloid, saussurine) is used for asthma, particularly of vagotonic type. It produces a definite relaxation of the bronchioles. The relief obtained is comparable to that of conventional bronchodilators without side effects, like a rise in blood pressure, sweating or headache even on repeated administration.

Saussurine depresses parasympathetic nervous system. The aminoacid-sesquiterpene adducts, saussureamines A, B and C show antiulcer effect. The aqueous extract of the root exhibits antianginal activity.

Essential oil inhibits peristaltic movement of the gut. It is absorbed from the gastro-intestinal tract and partly excreted by lungs producing an expectorant action and partly by the kidneys producing diuretic effect. (In Western herbal, Kuth essential oil is not prescribed internally.)

Kuth roots contain resinoids (6%), and essential oil (1.5%), alkaloid (0.05%) inulin (18%), saussurea lactone (20–25%), a fixed oil and minor constituents like tannin and sugars. Roots obtained from Kashmir are, in general, richer in essential oil content than roots obtained from Garhwal and Nepal. The roots of Punjab variety gave cos-

tunolide, dehydrocostuslactone, costic acid, palmitic and linoleic acids, beta-sitosterol and alpha-cyclocostunolide. The Kashmir variety, in addition, gave alantolactone, beta-cyclocostunolide and *iso*-alantolactone.

The essential oil of the roots exhibit strong antiseptic and disinfectant activity against *Streptococcus* and *Staphylococcus*.

Costus speciosus Sm. synonym *Banksea speciosa*, also known as Kushtha, is a different herb of *Zingiberaceae* family. Rhizomes and stems yield diosgenin.

Dosage ► Root—0.2–1.0 g powder. (*API*, Vol. I.)

Saussurea obvallata

Wall. ex C. B. Clarke.

Family ► *Compositae; Asteraceae*.

Habitat ► The Himalayas from Kashmir to Sikkim at 4,200–5,000 m.

Folk ► Brahma-kamal (Kumaon); Birm-kanwal (Punjab).

Action ► Roots—antiseptic, styptic, anti-inflammatory. Applied to wounds and cuts.

Plant—hypothermic. Flower—CNS active, antiviral. The flowers, after frying, are used in rheumatism.

Saussurea sacra Edgew.

Family ► *Compositae; Asteraceae*.

Habitat ▶ Near snow line at elevations of 4,000 m and above in the Himalayas.

English ▶ Yogiraj Plant, Sacred Saussurea.

Folk ▶ Jogi-paadshaah (Kashmir), Ghuggi (Garhwal).

Action ▶ Plant—used for nervous debility. Root—used for gynaecological disorders.

Scaevola frutescens auct. non-Krause.

Synonym ▶ *S. koenigii* Vahl.
S. taccada (Gaertn.) Roxb.

Family ▶ *Goodeniaceae*.

Habitat ▶ Sea coasts all around India and in the Andaman Islands.

English ▶ Fan Flower, Malay Rice Paper Plant.

Siddha/Tamil ▶ Vella-muttangam.

Folk ▶ Bhadraka, Bhadraaksha.

Action ▶ Leaves—digestive, carminative; applied externally on tumours and swollen legs. Fruit—juice, internally for inducing menstruation. Roots—used for dysentery.

A decoction of the leaves and the bark is reported to combat tachycardia, one of the principal symptoms of beriberi. The drug reduces the frequency of heartbeat, slows down pulse rate and at the same time stimulates the heart to normal contraction (does not possess cumulative action of digitalis). The drug acts as a diuretic by increasing the tension in the renal arteries without causing irritation of the

kidney parenchyma; and is used for dropsy.

The aerial parts gave loganin, sylvestroside III, its dimethyl acetal, cantleyoside and its dimethyl acetal.

Schima wallichii (DC.) Korth., Choicy.

Family ▶ *Theaceae*.

Habitat ▶ Eastern Himalayas from Nepal eastwards to Assam, Khasi Hills and Manipur up to 2,100 m.

English ▶ Chilauni Needle Wood.

Folk ▶ Chilauni. Makria (Assam).

Action ▶ Stem bark—anthelmintic (used for tapeworms), rubefacient. Aerial parts—antifungal.

The plant contains octacosanol, phytol, alpha-spinasterol and a saponin, schiwallin. Schiwallin is antidermatophytic.

The bark and leaves contain 6% and 4% tannin, respectively.

Schizachyrium exile Stapf.

Synonym ▶ *Andropogon exilis* Hochst.

Family ▶ *Gramineae; Poaceae*.

Habitat ▶ Bihar, Assam, Bengal and Tamil Nadu.

Ayurvedic ▶ Sprkaa, Sprk.

Action ▶ Used as a substitute for *Delphinium Zalil*.

Schleichera oleosa (Lour.) Oken.**Synonym** ▶ *S. trijuga* Willd & Klein.**Family** ▶ *Sapindaceae*.**Habitat** ▶ The sub-Himalayan tract from Kashmir to West Bengal; Bihar, Punjab, Madhya Pradesh, southwards to Peninsular India.**English** ▶ Lac tree, Macassar Oil tree, Honey tree, Ceylon Oak.**Ayurvedic** ▶ Koshaamra, Kshudraamra, Lakshaa vrksha, Ghanaskandha.**Siddha/Tamil** ▶ Puvathipuvam, Pulaachi.**Action** ▶ Bark—astrigent; mixed with oil, applied externally in skin eruptions. Seed oil—used for massage in rheumatism and applied in alopecia, itch and acne; stimulates hair growth. (Tree is an important host of Kusmi lac.)

Fatty acids of the oil consisted of oleic (52%), gadoleic, stearic, arachidic, behenic, palmitoleic and palmitic acids. Young leaves contain gallo-tannic acid (5.09%, dry matter basis). The bark contains 9.4% tannin.

Dosage ▶ Bark—50–100 ml decoction. (CCRAS.)**Schrebera swientenioides** Roxb.**Family** ▶ *Oleaceae*.**Habitat** ▶ Tropical and subtropical Himalayas from Kumaon eastwards; also Bihar, West Bengal and Peninsular India, up to 1,200 m.**English** ▶ Weaver's Beam tree.**Ayurvedic** ▶ Muskakaa. (Mokshaka, Ghantaa-Paatali, Kaashthapaatalaa are varieties of Paatalaa.)**Siddha/Tamil** ▶ Mogalingum.**Action** ▶ Leaves—used in enlargement of spleen and in urinary discharges. Root—used for leprosy. Bark—used for boils and burns. Fruits—beneficial in hydrocele.

The Fruits gave betulinic and oleonic acids.

Schweinfurthia sphaerocarpa
A. Br.**Synonym** ▶ *S. papilionacea* (Burm. f.) Boiss.**Family** ▶ *Scrophulariaceae*.**Habitat** ▶ The arid regions of Gujarat and in Rajasthan.**Ayurvedic** ▶ Nepaal-Nimba.**Folk** ▶ Saannipaat (Maharashtra).**Action** ▶ Broken pieces of dried fruits, stems and leaves—used in enteric fever. Leaf—antidiabetic. Fruit, leaf, stem—diuretic.

An alkaloid, schweinfurthin, a hydrocarbon and an unsaturated ketone were reported from the leaves. Recently, two macrocyclic alkaloids, 11-*epi*-ephedradine and schweinine, have been isolated from the whole plant, along with (–)-ephedradine A. Experimentally, 11-*epi*-ephedradine A was mutagenic to *Salmonella typhimurium*.

Scilla indica Baker non-Roxb.

Synonym ▶ *S. hyacinthiana* (Roth) Macb.

Ledebouria hyacinthina Roth.

Family ▶ *Liliaceae*.

Habitat ▶ Central and Southern India, including Deccan Peninsula.

English ▶ South Indian Squill. Substitute for White Squill, *Urginea maritima* Baker and Indian Squill, *Urginea indica* Kunth.

Ayurvedic ▶ Vana-Palaandu (South India), Korikanda.

Unani ▶ Jangli Piyaz.

Siddha/Tamil ▶ Kattu velvengayam.

Action ▶ Bulb—cardiotonic, stimulant, expectorant, diuretic. Used in cough, dysuria, strangury. (Not used as a diuretic when kidneys are inflamed.)

The bulb contains cardioactive glycosides including bufadienolides, scillaren A, scillaridin A and proscillaridin A.

The squill has shown to have cardiac effects similar to digoxin, including positive inotropic and negative chronotropic effects. The aglycones in squill are poorly absorbed from the GI tract and are therefore less potent than digitalis cardiac glycosides. Additional cardiovascular properties include reducing left ventricular diastolic pressure and reducing pathologically elevated venous pressure. (*Natural Medicines Comprehensive Database*, 2007.)

Large amounts of squill are gastric irritants; small amounts expectorant.

The squill of the Indian bazaars consists partly of *S. indica* and chiefly of *Urginea indica*.

Scindapsus officinalis Schott.

Family ▶ *Araceae*.

Habitat ▶ Tropical Himalayas, Bengal, southwards to Andhra Pradesh and the Andamans.

Ayurvedic ▶ Gajakrishna, Hastipip-pali, Gajapip-pali (also equated with *Piper chaba*).

Siddha/Tamil ▶ Anaitippili.

Action ▶ Fruits—stimulant, carminative, diaphoretic, anthelmintic, anti-diarrhoeal. Decoction is used as an expectorant in asthma. Fruits and shoots—hypoglycaemic. Fruit pulp—applied externally in rheumatism.

The Ayurvedic Pharmacopoeia of India recommends dried pieces of mature female spadix in dyspnoea. (Gajapip-pali is wrongly equated with male or female inflorescence of *Borassus flabel-lifer* Linn.)

The fruits contain two glycosidic substances—scindapsin A and B, which on hydrolysis yield the aglucons, scindapsinidine A and B. Free sugars, rhamnose, fructose, glucose and xylose together with some di- and trisaccharides have been identified in the plant.

Dosage ▶ Dried pieces of mature female spadix—2–3 g for infusion. (*API*, Vol. II.)

Scirpus articulatus Linn.**Family** ▶ *Cyperaceae*.**Habitat** ▶ Grown in aquatic gardens.**Ayurvedic** ▶ Laghu Kasheruka.**Folk** ▶ Chichodaa.**Action** ▶ Tubers—prescribed in diarrhoea and vomiting.See *S. kysoor*.**Scirpus corymbosus** Roth.**Family** ▶ *Cyperaceae*.**Habitat** ▶ Throughout India, in shallow waters.**Ayurvedic** ▶ Kronchaadana.**Action** ▶ Tuber—prescribed for diarrhoea, dysentery and emesis.**Scirpus kysoor** Roxb.**Synonym** ▶ *S. grossus* Linn. f.**Family** ▶ *Cyperaceae*.**Habitat** ▶ Distributed throughout India, especially in swamps, up to an altitude of 700 m.**Ayurvedic** ▶ Kaseru, Kasheruka.**Siddha/Tamil** ▶ Karundan, Gundati-gagaddi (rhizome).**Folk** ▶ Kaseru.**Action** ▶ Tuber—nutritious, astringent, antidiarrhoeal, antiemetic, galactagogue, hypoglycaemic, diuretic, urinary antiseptic. Used in prescriptions for dysuria, diabetes, genitourinary affections, dyscrasia

and as a spermopoietic and liver tonic.

The Ayurvedic Pharmacopoeia of India recommends the powder of the rhizome for promoting spermatogenesis and development of breast.

The tuber gave progesterone, sugars, tannins, starch and saponins. The fruit contains amylase.

The tuber of *Scirpus lacustris* L. (Kashmir, Ladakh, Kumaon), known as Great Bulrush or Clubrush, is also used as astringent, diuretic and antimicrobial. The aromatic compounds isolated from the rhizomes include derivatives of benzaldehyde, hydroxybenzoic and cinnamic acids.**Dosage** ▶ Rhizome—5–10 g powder. (*API*, Vol. I.)**Scirpus tuberosus** Desf.**Synonym** ▶ *S. maritimus* C. B. Clarke non Linn.**Family** ▶ *Cyperaceae*.**Habitat** ▶ Marshy areas and on the banks of streams up to an altitude of 3,000 m.**English** ▶ Sea Clubrush.**Ayurvedic** ▶ Raaj Kasheruka.**Action** ▶ Tuberous root—stringent, diuretic, laxative.

Oil from rhizomes on hydrolysis gave phellonic acid.

Scleria lithosperma Sw.**Family** ▶ *Cyperaceae*.

Habitat ► Throughout India, up to an altitude of 900 m, except in arid areas in the West.

English ► Scleria.

Action ► Plant—antinephritic. Root—decoction is given after parturition. Young tops—given to children for enlarged stomach.

The roots of *Scleria biflora* Roxb. smell strongly of camphor or cajeput.

The fruits of *S. levis* are used for cough and stomach disorders.

A decoction of the sedge of *S. pergracilis* (Nees) Kunth (the Himalayas from Garhwal to Assam at altitudes of 1,500 m and in Bihar, West Bengal and Deccan Penninsula) is used for cough.

(Folk names not known. About 28 species are found in India.)

Scoparia dulcis Linn.

Family ► *Scrophulariaceae*.

Habitat ► Indigenous to tropical America; introduced into India, commonly found as a weed in Bengal and Tamil Nadu, and in many parts of India.

English ► Sweet Broomweed.

Folk ► Jastimadhu, Madhukam, Ghodaa-tulasi.

Action ► Plant—decoction is used for gravel and other renal affections. Leaves—infusion used in fever, cough and bronchitis. Root—febrifuge. Stem and leaves—used in anemia, albuminaria, ketonuria and other complications associated with diabetes mellitus.

An antidiabetic compound, amellin, occurs in the leaves and stems of the green plant.

According to some researchers, hypoglycaemic compounds were not present in the extracts obtained from dry plant material.

The leaves contain the flavonoids, scutellarein and 7-O-methylscutellarein. Whole plant gave the triterpenoids, dulcitol, friedelin, scopadol, betulinic acid, dulcitolic acid and dulcitolone. Benzoxazolinone, beta-sitosterol, D-mannitol, hexacosanol and triacontane were also obtained from the plant.

Scopolia anomala Airy Shaw.

Synonym ► *S. lurida* Dunal.

Family ► *Solanaceae*.

Habitat ► The Himalayas from Kumaon to Sikkim, up to 3,900 m.

English ► Scopolia.

Action ► Used like belladonna.

Dried leaves contain 0.32% of alkaloids comprising hyoscyamine, himaline, atropine and scopolamine.

Ripe seeds contain a small amount of atropine but no hyoscyamine. Extracts of leaves, stalks and seeds showed presence of atropine, scopolamine, cuscohygrine, hellaradine, tropine, scopine. The alkaloid himaline exhibits atropine type activity. Roots (total alkaloid content 1.9–2.8%), in addition, contain hyoscyamine and himaline. The alkaloid content of the root is reported to be 4.64 times more than that of the leaves of *Atropa belladonna*.

Flavonoids occurring in the leaves and roots are chlorogenic acid, scopoletin, and scopoline; the leaves, in addition, contain rutin and caffeic acid.

A related species, *S. carniolica* Jacquin, (rhizome), has been approved by *German Commission E*, for use in spasm of gastrointestinal tract, bile ducts and urinary tract.

The rhizome of *S. carniolica* (Central and Eastern Europe) gave tropane alkaloids, including hyoscyne and hyoscyamine with cuscohygrine, tropine and pseudotropine.

Leaf extract of Indian species (*S. anomala*) is found to be more active than belladonna infusions.

Scutellaria galericulata Linn.

Family ▶ *Labiatae; Lamiaceae.*

Habitat ▶ Kashmir at 1,500–2,400 m.

English ▶ Skullcap (equated with *S. lateriflora* Linn.), Scurvy Grass.

Action ▶ Central nervous relaxant and restorative, brain and CNS vasodilator, sedative, antispasmodic, anticonvulsive. Used for nervous stress, disturbed sleep, menstrual tension, headache, migraine, neurological and neurimotor conditions, epilepsy.

Roots, stem and flowers of *S. galericulata* gave flavonoids and their glycosides, chrysin-7-glucuronide, baicalein, baicalin, apigenin, apigenin-7-glucoside and galeroside (baicalcin-7-beta-L-rhamnofuranoside). Cytotoxicity of baicalin and baicalein (isolated from *S. barbata* D. Don synonym *S.*

rivularis Wall.) has been investigated on human hepatoma cell lines, human liver cells and human pancreatic cancer line. (*Chem Abstr*, 121, 292196y, 1994.)

S. galericulata is used as an adulterant of *S. lateriflora*. (See also *WHO* monograph on *Scutellaria grandiflora* Adams.)

In Oriental medicine, Skullcap refers to *S. baicalensis* Georgi. It contains the flavonoids baicalin, baicalein, wogonin, skullcapflavones I and II in addition to other flavones. Baicalin exhibits anti-inflammatory and antiallergic properties.

S. baicalensis inhibited lipid peroxidation in rat liver and has been clinically tested in China; patients with chronic hepatitis showed improvement (above 70%) in various symptoms. (*Potter's New Cyclopaedia.*)

According to *The British Herbal Pharmacopoeia*, *S. lateriflora* can be used as a mild sedative.

Scutia myrtina Kurz.

Synonym ▶ *S. indica* Brongn.

Family ▶ *Rhamnaceae.*

Habitat ▶ The Deccan peninsula from Mahabaleshwar southwards, and Orissa.

Folk ▶ Cheemaat (Gujarat, Maharashtra); Tuvadi (Tamil Nadu); Gariki (Andhra Pradesh).

Action ▶ Fruit—astringent. Leaf—used in an ointment applied locally to hasten parturition.

Sebastiania chamaelea Muell.-Arg.

Family ▶ *Euphorbiaceae*.

Habitat ▶ Uttar Pradesh, Madhya Pradesh, Bihar, West Bengal, Orissa and South India.

Folk ▶ Bhui-erendi.

Action ▶ Plant—astrigent, antidiarrhoeal. A decoction of the plant, mixed with purified butter, is applied to the head in vertigo.

Secale cereale Linn.

Family ▶ *Poaceae*.

Habitat ▶ Ladakh, Lahul and other north-western Himalayan areas; and as host for cultivation of medicinal ergot (fungus) in Kashmir.

English ▶ Rye Grass.

Action ▶ Grass—used for benign prostatic hyperplasia (BPH), chronic prostatitis and prostatodynia.

Rye bread, biscuits, porridge and alcoholic products are available in European countries and the US. Rye grain contains 12.1% protein; made up of 42% gliadin (a prolamine), 42% glutelin, 8% globulin and 8% albumin. The biological value of Rye protein at 5% level of intake is 80.4% and the coefficient of true digestibility 91.0%.

The mineral contents in the grain are: calcium 61, potassium 453, magnesium 155, phosphorus 376, sulphur 146 and iron 4.8 mg/100 g; and small amounts of zinc, copper, manganese

and aluminium. The carbohydrates (73.4%) include sucrose, pentosans, starch and raffinose.

Medicinally applicable part of Rye Grass is the pollen extract. The extract contains beta-sitosterol; relaxes urethral smooth muscle tone and increases bladder muscle contraction. Some evidence suggests that it might affect alpha-adrenergic receptors and relax the internal and external bladder sphincter muscle. The extract does not affect LH, FSH, testosterone or dihydrotestosterone. A specific Rye Grass pollen extract 126 mg three times daily has been used for BHP. (*Natural Medicines Comprehensive Database*, 2007.)

(It is not known if Rye Grass pollen is comparable to finasteride or hytrin. However, it is comparable to Pygeum and Paraprost, a Japanese prostate remedy containing L-glutamic acid, L-alanine and aminoacetic acid.)

Securinega suffruticosa (Pall.) Rehder.

Synonym ▶ *S. ramiflora* Muell.
Flueggea suffruticosa Baill.

Family ▶ *Euphorbiaceae*.

Habitat ▶ Eastern Himalayas, up to an altitude of 250 m.

Siddha/Tamil ▶ Vellaippula (*S. virosa*).

Folk ▶ Dalme, Kodarsi, Pandharphali (*S. virosa*).

Action ▶ Alkaloid, securinine in the leaves stimulates central nervous system similar to strychnine and

is comparatively less toxic. It is found useful in paresis and paralysis following infectious diseases and physical disorders. (The plant can replace strychnine and nux-vomica in medicinal preparations.)

A related species, *Securinega virosa* (Roxb. ex Willd.) Baillon, distributed throughout India up to an altitude of 2,000 m, gave securinine as the main alkaloid, along with virosecurinine and viroallosecurinine, and a coumarin, bergenin. The root bark contains an alkaloid, virosine. Whole root contains alkaloids, hordenine (flueggeine) and nor-securinine. A decoction of the root is given to induce sleep and for fever; that of bark in diarrhoea and pneumonia. The leaves are reported to be given in venereal diseases.

Selaginella involvens Spring.

Family ▶ *Selaginellaceae*.

Habitat ▶ Hilly regions of India at altitudes of 1,000–2,000 m.

Ayurvedic ▶ Kara-jodi-kanda (related species).

Folk ▶ Hatthaa jodi (related species).

Action ▶ Used as an age-sustaining tonic. The original source is *S. rupestris* Spring.

Selaginella rupestris Spring.

Family ▶ *Selaginellaceae*.

Habitat ▶ Indian gardens, as ornaments.

English ▶ Little Clubmoss.

Ayurvedic ▶ Kara-jodi-Kanda.

Folk ▶ Hatthaaajodi.

Action ▶ Plant—a decoction is prescribed as a tonic and protective medicine after child birth; also as a sedative.

S. tamariscina Spring var. *pulvinata* (Kumaon to Assam), known as Hatt-haajodi, is used as an age-sustaining tonic and has been credited with the property of prolonging life. A decoction is prescribed for amenorrhoea, bleeding piles and prolapse of rectum.

A decoction of *S. wallichii* Spring (hilly regions of north-eastern India), known as Hatthaaajodi, is prescribed after childbirth. *S. willdenovii* Baker (Nicobar Islands) is also known as Hatthaaajodi. Its infusion is administered in cases of high fever and ashes are used in a liniment for backache.

Selenicereus grandiflorus

Britton & Rose.

Synonym ▶ *Cereus grandiflorus* Mill.

Family ▶ *Cactaceae*.

Habitat ▶ Indigenous to Mexico; introduced in Indian gardens.

English ▶ Night-Blooming Cereus, Sweet-scented Cactus.

Ayurvedic ▶ Visarpin, Mahaapushpa, Raatripraphulla.

Action ▶ Flowers and tender shoots—cardiac stimulant and diuretic (used for irritable bladder and congested kidneys), central nervous system stimulant.

The plant contains alkaloids (including cactine) and flavonoids based on isorhamnetin.

Alkaloid, cactine is reported to have a digitalis-like activity on the heart. (Alcoholic extract is used in homoeopathy.)

Selinum monnieri Linn.

Family ▶ *Umbelliferae; Apiaceae.*

Habitat ▶ East Bengal, Bhutan and Assam.

Folk ▶ Muraa (var.).

Action ▶ Fruits—extracts used for osteoporosis, gynaecological problems and stress-related disorders. Seeds—prescribed in rheumatism and renal diseases.

In Japan, the plant is mainly used for the treatment of swelling of women's genitals.

The aerial parts contain the chromones, cnidimol and karenin. The fruits contain the benzofurans, cnidioside A, B and C, cnidiol b and C; besides furocoumarins, imperatorin, bergapten, xanthotoxin, osthol and several terpenoids. The seeds and volatile oil from the fruits also contain osthol and other coumarins.

The coumarins prevented glucocorticoid-induced osteoporosis in rats; they also reversed bone loss at early menopausal stage. Osthol showed anti-allergic activity. Cnidioside A and B and cnidiol b alleviate physiological disorders caused by physical and mental stress; enhancement of sexual activity has also been observed.

Selinum tenuifolium

Wall. ex DC.

Synonym ▶ *S. candollei* DC.

Family ▶ *Umbelliferae; Apiaceae.*

Habitat ▶ The Himalayas from Kashmir to Nepal at altitudes of 1,800–4,200 m.

Ayurvedic ▶ Muraa, Surabhi, Daitya, Gandhakuti, Gandhavati. (Substitute for *Nardostachys jatamansi*.)

Siddha/Tamil ▶ Mural.

Folk ▶ Bhuutakeshi (Kashmir), Muur (Garhwal).

Action ▶ Roots—sedative, analgesic.

Isoimperatorin and oxypeucedanin have been isolated as major inotropic constituents from the rhizomes.

The Ayurvedic Pharmacopoeia of India recommends the root in syncope, giddiness, also for asthma.

Dosage ▶ Root—1–3 g powder. (*API*, Vol. II.)

Selinum vaginatum C. B. Clarke.

Family ▶ *Umbelliferae; Apiaceae.*

Habitat ▶ North-Western Himalayas from Kashmir to Kumaon at altitudes of 1,800–3,900 m.

Ayurvedic ▶ Rochanaa-Tagara.

Folk ▶ Peshavari-Bhuutakeshi (Kashmir), Taggar (Garhwal).

Action ▶ Roots—used as a nervine sedative. Oil—sedative, analgesic, hypotensive.

The roots gave coumarins, angelicin, oroselol, lomatol, selinidin, vagenidin, vagenol; a flavone derivative selinone; a sesquiterpene vagenatin.

The dry roots yield an essential oil containing alpha-pinene 45.5, limonene 25.3, camphene 5.7, beta-phellandrene 5.2, alpha-thujene 1.2, fenchyl alcohol 3.2, terpineol 3.8, and a ketone 2.6%. Beta-pinene and fenchone have also been reported.

The roots are sold in the drug markets of Jammu mixed with those of *Seseli sibiricum*. The roots are also used as a substitute for *Nardostachys jatamansi*.

Semecarpus anacardium Linn. f.

Family ▶ *Anacardiaceae*.

Habitat ▶ Punjab, Assam, Khasi Hills, Madhya Pradesh and Peninsular India.

English ▶ Marking-Nut.

Ayurvedic ▶ Bhallaataka, Bhallata, Arushkara, Agnik, Agnimukha, Sophkrit, Viravrksha.

Unani ▶ Balaadur, Bhilaayan, Bhilaavaan.

Siddha/Tamil ▶ Shenkottei, Erimugi. (Kattu shen-kottai is equated with *S. travancorica* Bedd., found in evergreen forests of Tinnevely and Travancore.)

Folk ▶ Bhilaavaa.

Action ▶ Toxic drug, used only after curing. Fruit—caustic, astringent, anti-inflammatory, antitumour. Used in rheumatoid arthritis and

for the treatment of tumours and malignant growths.

A decoction, mixed with milk or butter fat, is prescribed in asthma, neuralgia, sciatica, gout, hemiplegia, epilepsy. Kernel oil—antiseptic; used externally in gout, leucoderma, psoriasis and leprosy. Bark gum—used for nervous debility; in leprosy, scrofulous and venereal affections.

Bigger var. is equated with *S. kurzii* Engler.

The nut shells contain biflavonoids, including tetrahydrobustaflavone, tetrahydroamentoflavone and anacardiflavanone; nallaflavone; anacardic acid; aromatic amines and bhilawanol. Bhilawanol is a mixture of phenolic compounds, including *cis* and *trans* isomers of urushenol (3-pentadecenyl-8' catechol), monohydroxy phenol and semicarpol. These are the major constituents of the shell liquid, isolated from the nuts (about 46% of the weight of extract).

A mixture of closely related pentadecyl catechols exhibits anticancer activity. Extracts of the fruit was found effective against human epidermoid carcinoma of the naso-pharynx in tissue culture.

Milk extract of the nut showed anti-inflammatory activity against carrageenin, 5-HT and formaldehyde-induced rat paw oedema in acute anti-inflammatory studies. (About 20% animals developed gangrene of limbs, tail and ears.)

Dosage ▶ Detoxified fruit—1–2 g in milk confection. (*API*, Vol. II.)

Sempervivum tectorum Linn.

Family ► *Crassulaceae*.

Habitat ► Nilgiris, as ornament. (A common garden plant in Britain and Europe.)

English ► Houseleek.

Action ► Leaves—refrigerant, astringent, antispasmodic; applied as poultice to inflammatory conditions of skin. Juice of the leaves is applied topically for treating corns.

The leaves sliced in two and the inner surface applied to warts, act as a positive cure for corns.

The leaves contain tannin, malic acid and mucilage. Three related species are found in the alpine Himalayan range from Kumaon to Kashmir.

Senecio jacquemontianus

Benth.

Family ► *Compositae; Asteraceae*.

Habitat ► The Western Himalayas and Kashmir at elevation of 3,000–3,900 m.

Folk ► Poshkar, Hatermuula (Kashmir).

Action ► Root—nervine tonic. Used as an adulterant of *Saussurea lappa*.

Whole plant extract gave senecionine.

Senecio vulgaris Linn.

Family ► *Compositae; Asteraceae*.

Habitat ► The Nilgiris and Uttar Pradesh. Introduced into Indian gardens

English ► Groundsel.

Action ► Formerly used as a diuretic, diaphoretic and emmenagogue, in dysmenorrhoea and bilious pains. No more recommended for internal use due to high concentration of hepatotoxic alkaloids. Infusion is used as a lotion in chronic mastitis, gout and haemorrhoids. Extracts of the plant are haemostatic.

From the dried plant material alkaloids (0.053–0.095%) have been isolated, including, seneciphylline, senecionine and retrorsine. Senecionine and retrorsine have been demonstrated to induce hepatic necrosis in experimental animals. The plant contains 950 mcg/kg of iodine on fresh basis.

A related species used in Western herbal, *Senecio aureus* Linn. (Golden Groundsel, Squaw Weed) is a uterine relaxant, stimulant to gravid uterus and a soothing drug for nervous and vascular irritability, menopausal symptoms, hot flushes. Alkaloids include senecifoline, senescine, senecionine and otosene—pyrrolizidine alkaloids, in isolation, are highly toxic to liver. The plant is recommended only for external use as a douche for excessive vaginal discharge.

Serenoa repens (Bartram) Small.

Synonym ► *Sabal serrulata* (Michaux) Nichols.

Family ► *Palmae*.

Habitat ▶ Southeastern North America.

English ▶ Sabal, Saw Palmetto.

Action ▶ Ripe fruit—diuretic, urinary antiseptic, antiandrogenic, and antiexudative.

The fruit contains fatty acids, especially capric, caproic, caprylic, lauric, myristic, oleic, linoleic, linolenic, stearic and palmitic acids; sterols, principally beta-sitosterol and its 3-glucoside (and fatty acid derivatives), campesterol and stigmasterol; triglycerides; triterpenes; alkanols; polysaccharides; flavonoids; essential oil and anthranilic acid.

Key application ▶ In urination problems due to benign prostatic hyperplasia stages I and II (*German Commission E, ESCOP, WHO.*) (The lipophilic extracts of Saw Palmetto berries are used in France and Germany for the treatment of BPH. In a study (1999), shrinkage of the epithelial tissue in the transition zone of the prostate has been recorded. (*Expanded Commission E Monographs.*) (For Clinical studies, see *ESCOP.*)

In India, *Sabal palmetto* Lodd. Ex Roem. & Schult (Sabal or Cabbage Palm) is planted in gardens for ornament. The sweet drupes are eaten as such or cooked for preparing a syrup. Other species of Sabal introduced into Indian gardens are: *S. mauritiiformis* Griseb. & Wendl., *S. mexicana* Mart., *S. umbraculifera* Mart., and *S. minor* Pers. The leaves of *S. mexicana* contain cyanidin. The leaves of *S. minor*

contain caffeic, *p*-coumaric and sinapic acids.

Sesamum indicum Linn.

Synonym ▶ *S. orientale* Linn.

Family ▶ *Pedaliaceae.*

Habitat ▶ Uttar Pradesh, Madhya Pradesh, Rajasthan, Orissa, Gujarat, Andhra Pradesh, Tamil Nadu, and Maharashtra.

English ▶ Sesame, Gingelly.

Ayurvedic ▶ Tila, Snehpala.

Unani ▶ Kunjad, Til.

Siddha ▶ Ellu (seed), Nallennai (oil).

Action ▶ Seeds—an important source of protein; also rich in thiamine and niacin. Nourishing, lactagogue, diuretic, laxative, emollient. Powdered seeds—given internally in amenorrhoea and dysmenorrhoea. (Black seeds are preferred in Indian medicine.) Paste is applied to burns, scalds, piles. Leaves—used in affections of kidney and bladder. Bland mucilage is used in infantile diarrhoea, dysentery, catarrh and bladder troubles, acute cystitis and strangury.

Non-saponifiable fraction of the seed oil gave sterols, a lignans, sesamin and a nitrolactone, sesamol. Sesamin and sesamol are not found in any other vegetable oil. Sesamin is present in a concentration of 0.5 to 1.0%. The oil from the white seeds from West Bengal and Assam is reported to contain about 2.5% sesamin. Sesamol, a phenolic antioxidant, is present in traces.

The leaves gave a flavonoid, pedalin. Pinoresinol has also been reported from the plant.

The seed contains thiamine, niacin, riboflavin, nicotinic acid, pantothenic acid, folic acid, biotin, pyridoxine, inositol, choline, *p*-aminobenzoic acid, ascorbic acid, vitamin A, alpha- and beta-tocopherol. Sugars present are glucose, sucrose, galactose, plantose, raffinose. Fatty acid in the seed are myristic, palmitic, stearic, arachidic, hexadecenoic, oleic, linoleic and lignoceric.

Basic aroma compounds of the roasted seeds consisted of mainly dimethyl thiazole and substituted pyroazines.

Dosage ▶ Seed—5–10 g powder.
(*API*, Vol. IV.)

Sesbania bispinosa W. f. Wight.

Synonym ▶ *S. aculeata* (Willd.) Poir.

Family ▶ *Papilionaceae; Fabaceae*.

Habitat ▶ Western Himalayas and plains, southwards to Peninsular India.

English ▶ Prickly Sesban, Dhaincha.

Ayurvedic ▶ Jayanti (var.), Itkata (var.).

Siddha/Tamil ▶ Mudchembai.

Action ▶ Seeds—used externally in ringworm and skin diseases.
Plant—used for treating wounds.

The leaf, stem and fruit gave positive test for alkaloids. A mixture of saponins, reported to be present in the seeds, yields on hydrolysis oleanolic acid and neutral saponin. Colloidal

substances similar to those of marine algae, locust bean gum, guar gum and gum tragacanth are reported in the seeds.

Sesbania grandiflora (L.) Poir.

Synonym ▶ *Agati grandiflora* Desv.

Family ▶ *Papilionaceae; Fabaceae*.

Habitat ▶ Native to tropical Asia; grown in Assam, Bengal, Punjab, Vadodara, Andhra Pradesh and Tamil Nadu.

English ▶ Agati Sesban, Swamp Pea.

Ayurvedic ▶ Agastya, Agasti, Munidrum, Munitaru, Muni, Vangasena, Vakrapushpa, Kumbha.

Siddha/Tamil ▶ Agatti.

Action ▶ Plant—astrigent, antihistaminic, febrifuge. Used for intermittent fevers, catarrh, cough, consumption, glandular enlargement.

The aqueous extract of flowers has been found to produce haemolysis of human and sheep erythrocytes even at low concentration due to methyl ester of oleanolic acid. Flowers also gave nonacosan-6-one and kaempferol-3-rutinoside.

The seed gave kaempferol-3,7-diglucoside, (+)-leucocyanidin and cyanidin-3-glucoside. Seed also contains galactomannan.

A saponin present in the leaves on hydrolysis gave an acid saponin oleanolic acid, galactose, rhamnose and glucuronic acid. Besides saponin, the leaves contain an aliphatic alcohol, grandiflorol.

The bark contains gum and tannin. The red gum is used as a substitute for Gum arabic. An infusion of the bark is given in first stages of smallpox and other eruptive fevers (emetic in large doses).

Dosage ▶ Whole plant—10–20 ml juice; 50–100 ml decoction. (CCRAS.)

Sesbania sesban (Linn.) Merrill.

Synonym ▶ *S. aegyptiaca* Pers.

Family ▶ *Papilionaceae; Fabaceae.*

Habitat ▶ Cultivated and wild throughout India.

English ▶ Common Sesban.

Ayurvedic ▶ Jayantikaa, Jayanti, Jayaa, Jwaalaamukhi, Suukshma-muulaa, Suukshma-patraa, Keshruuhaa, Balaamotaa.

Siddha/Tamil ▶ Sembai, Karum-sem-bai (leaf).

Folk ▶ Jainta.

Action ▶ Seed and bark—astrigent, emmenagogue. Used in menorrhagia, spleen enlargement and diarrhoea. Leaves—anti-inflammatory. Bark—juice applied to cutaneous eruptions. Unsaponifiable matter of fixed oil from seeds—cardiac depressant, antibacterial.

The Ayurvedic Pharmacopoeia of India recommends the use of the leaf in dysuria.

The pods and leaves contain cholesterol, campesterol and beta-sitosterol. Flowers contain cyanidin and delphinidin glucosides. Pollen and pollen tubes

contain alpha-ketoglutaric, oxaloacetic and pyruvic acids.

Dosage ▶ Leaf—3–6 g powder. (*API*, Vol. II.)

Seseli indicum W. & A.

Synonym ▶ *S. diffusum* (Roxb. ex Sm.) Santapau & Wagh

Family ▶ *Umbelliferae; Apiaceae.*

Habitat ▶ Outer hills of the Himalayas in Kumaon and in the plains from Punjab to Bengal, and in Tamil Nadu and Mysore.

Ayurvedic ▶ Vanya-yamaani.

Action ▶ Seeds—stimulant, anthelmintic (used for round worms), carminative.

Seselin, isolated from the seeds, exhibited significant and dose-dependent anti-inflammatory activity in carrageenan-induced acute inflammation in rats. It also exhibited significant analgesic activity and was found to be safe in oral doses up to 6 g/kg (body weight) in 72 h mortality test in mice.

A sample of commercial oil, available as Ajmod Oil, is reported to contain (+)-limonene (50%), seselin, (–)-beta-selinene and beta-cyclolavendulic acid.

Seseli sibiricum

Benth. ex C. B. Clarke

Family ▶ *Umbelliferae; Apiaceae.*

Habitat ▶ Jammu and Kashmir at altitudes of 2,500 to 3,500 m.

Ayurvedic ► Bhuutakeshi. *Selinum* sp. are also known as Bhuutakeshi.

Action ► Used for mental disorders as a tranquilizer. Volatile oil—hypotensive.

The volatile oil, distilled from the root, contains alpha- and beta-pinene, myrcene, limonene, *p*-cymene, beta-phellandrene (major constituent), fenchone, fenchyl alcohol and acetate, fenchyl hydroxy cinnamate, osthol, *p*-hydroxy cinnamate (0.1%), sesibricin, imperatorin and bergapten.

The volatile oil from aerial parts causes a fall in blood pressure, vasoconstriction and stimulation of respiration. The action appears to be tranquillizing. It potentiates the effects of pentobarbital in rats and has no anticonvulsant activity. Smooth muscle activity is inhibited by the oil and negative inotropic and chronotropic effects are observed on heart muscle.

Setaria italica (Linn.) Beauv.

Family ► Gramineae; Poaceae.

Habitat ► Cultivated in Andhra Pradesh, Tamil Nadu, Gujarat, Maharashtra and Karnataka.

English ► Italian Millet, Fox-tail Millet.

Ayurvedic ► Kangu, Kanguni, Kangunika, Priyangu Dhaanya (Millet). (Priyangu, aromatic flower buds or seed kernels, is a different drug. *Callicarpa macrophylla* and *Prunus mahaleb* are equated with Priyangu.)

Siddha/Tamil ► Tenai.

Action ► Plant—used as a sedative to the gravid uterus. Grain—used for alleviating pain after parturition. Applied externally in rheumatism.

(The grain is reported injurious to horses. Overfeeding affects kidneys and causes swelling and inflammation of joints.)

Analysis of a dehusked sample (79% of whole grain) gave following values: protein 12.3, fat 4.3, minerals 3.3, crude fibre 8.0, and other carbohydrates 60.9%. The principal protein of the millet is prolamin (48%), albumin and globulin together form 13–14% of the total protein, and glutelin 37%. The oxidation of unsaturated fatty acids, present in the grain, during the cold winter months is reported to yield toxic substances.

Shorea robusta Gaertn. f.

Family ► Dipterocarpaceae.

Habitat ► North, east and central India.

English ► Sal tree. Oleoresin: Sal Dammer or Bengal Dammer.

Ayurvedic ► Shaala, Saalasaara, Dhuupa-vriksha. (Substitute: *Vateria indica*.)

Siddha/Tamil ► Kungiliyam, Venkungiliyam (resin).

Action ► Fruit—a paste is prescribed in diarrhoea. Resin—stringent, detergent; antidiarrhoeal and antidyenteric. Essential oil of Sal resin—antiseptic. Used for skin diseases.

The bark contains 7–12, young leaves 20, twigs and leaves 22, and powder dust 12% tannin. The spray-dried aqueous extract of the bark contains 39.6% of tannins with a trans/non-trans ratio of 0.73. The tannins are of pyrogallol type. Oleanolic acid has also been isolated from the bark.

Several triterpenoids have been isolated from the resin. Hydroxy-hopanone, dammarediol II (20S) and dammarenolic acid are reported to exhibit antiviral activity against *Herpes simplex*. The resin on dry distillation yields an essential oil, known as Chuaa Oil. It consists of 96.0% neutral and 3.0 and 1.9% phenolic and acidic fractions respectively. Non-phenolic portion of the oil is reported to have a depressing effect on the central nervous system, the phenolic portion is less effective.

Dosage ▶ Heartwood, flower—3–5 g powder; 50–100 ml decoction; resin—1–3 g. (CCRAS.)

Sibbaldia parviflora Willd.

Family ▶ *Rosaceae*.

Habitat ▶ Garwal region.

Ayurvedic ▶ Bajradanti. *Barleria prionitis* L. and *Potentilla arbuscula* D. Don. are also used as Bajradanti.)

Action ▶ Used as a tooth powder for strengthening gums and teeth.

Sida acuta Burm. f.

Synonym ▶ *S. carpinifolia* auct. non Linn f.

Family ▶ *Malvaceae*.

Habitat ▶ Throughout the warmer parts of India.

English ▶ Hornbeam-Leaved Sida.

Ayurvedic ▶ Balaa (white-flowered var.).

Folk ▶ Jangali Methi.

Action ▶ Root—astrigent, cooling, stomachic, febrifuge, diuretic; used for nervous and sexual debility, haemorrhoids, biliary disorders. Leaves—demulcent; applied to testicular swellings and elephantiasis.

The root contains alkaloids—phenethylamine, ephedrine (major), silephedrine, vasicinol, vasicinone, vasicine, choline, hypaphorine and betaine. (These alkaloids are also present in aerial parts.) The root also contains alpha-amyrin and an hormone, ecdysterone. Whole plant, as well as the root, contains an alkaloid cryptolepine. Cryptolepine exhibits hypotensive and antimicrobial activity.

The seeds contain 0.26% of the alkaloids and roots 0.066%.

The water-soluble portion of the alcoholic extract of the plant exerts spasmodic action of the smooth muscles of ileum, trachea, uterus and heart of experimental animals. (The activity bears similarity to that of acetylcholine.)

Sida cordifolia Linn.

Family ▶ *Malvaceae*.

Habitat ▶ Throughout India in moist places.

English ▶ Country Mallow.

Ayurvedic ▶ Bala (yellow-flowered var.), Sumanganaa, Kharyashtikaa, Balini, Bhadrabala, Bhadraudani, Vaatyalikaa.

Unani ▶ Bariyaara, Khirhati, Khireti, Kunayi.

Siddha/Tamil ▶ Nilatutti.

Action ▶ Juice of the plant—invigorating, spermatopoietic, used in spermatorrhoea. Seeds—nervine tonic. Root—(official part in Indian medicine) used for the treatment of rheumatism; neurological disorders (hemiplegia, facial paralysis, sciatica); polyuria, dysuria, cystitis, strangury and hematuria; leucorrhoea and other uterine disorders; fevers and general debility. Leaves—demulcent, febrifuge; used in dysentery.

Ephedrine and *si*-ephedrine are the major alkaloids in the aerial parts. The total alkaloid content is reported to be 0.085%, the seeds contain the maximum amount. In addition to alkaloids, the seeds contain a fatty oil (3.23%), steroids, phytosterols, resin, resin acids, mucin and potassium nitrate.

The root contains alkaloids—ephedrine, *si*-ephedrine, beta-phenethylamine, carboxylated tryptamines and hypaphorine, quinazoline alkaloids—vasicinone, vasicine and vasicinol. Choline and betaine have also been isolated.

A sitoindoside, isolated from the plant, has been reported to exhibit adaptogenic and immunostimulatory activities. Alcoholic extract of the plant

possesses antibacterial and antipyretic propeptide. Ethanolic extract of the plant depresses blood pressure in cats and dogs.

Sida rhombifolia Linn.

Family ▶ *Malvaceae*.

Habitat ▶ Throughout India, in moist places.

English ▶ Common Bala.

Ayurvedic ▶ Mahaabalaa, Mahaa-samangaa, Sahadevaa, Kshetrabala.

Unani ▶ Bariyaara (red-flowered var.).

Siddha/Tamil ▶ Athi Bala-chedi, Chitrmutti, Tennacham.

Action ▶ Plant—used as a supporting drug in pulmonary tuberculosis, nervous diseases and rheumatism. Leaves—applied to swelling as paste. Stem-mucilage—demulcent and emollient. Used internally in skin diseases and as a diuretic and febrifuge.

The Ayurvedic Pharmacopoeia of India recommends the root in deficient spermatogenesis and oedema.

Alkaloids, ephedrine, *si*-ephedrine and cryptolepine, are reported from aerial parts. The root contains 0.054% alkaloids, beta-phenethylamine, N-methyl-beta-phenethylamine, vasicinol, vasicinone, vasicine, choline and betaine. These alkaloids are also present in the aerial parts.

Alcoholic extract of the root exhibited antibacterial and antipyretic activities.

Proteins, linoleic, malvlic and stercularic acids have been reported from seeds.

Dosage ▶ Root—3–6 g powder. (*API*, Vol. III.)

Sida rhombifolia Linn. var. *rhomboidea* (Roxb.) Mast

Family ▶ *Malvaceae*.

Habitat ▶ West Bengal.

Ayurvedic ▶ Mahaabalaa (white-flowered var.).

Action ▶ Plant—spasmolytic, anti-inflammatory. Root—sedative, CNS depressant.

Alkaloids from the plant exhibit antibacterial, antifungal and anthelmintic properties.

See *S. rhombifolia*.

Sida spinosa Linn.

Synonym ▶ *S. alba* Linn.

Family ▶ *Malvaceae*.

Habitat ▶ Throughout the hotter parts of India, ascending to an altitude of 1,350 m.

English ▶ Prickly Sida.

Ayurvedic ▶ Naagabalaa, Balaakantakini, Gangaati.

Siddha/Tamil ▶ Arivalmanai-poondu.

Folk ▶ Gulasakari, Gangeti, Jangalimethi.

Action ▶ Root—nervine tonic and diaphoretic; used in debility

and fevers. Decoction given as a demulcent in irritability of bladder and genitourinary tract. Leaves—demulcent and refrigerant; used for scalding urine.

The root contains alkaloids—beta-phenethylamine, ephedrine, *si*-ephedrine, vasicinol, vasicinone, vasicine, choline, hypaphorine, methyl ester, hypaphorine and betaine. These alkaloids are present in aerial parts as well.

Ethanollic extract of the plant exhibits hypoglycaemic activity. It depressed the normal blood pressure and lowered the activity of smooth muscles of the ileum of experimental animals.

Sida veronicaefolia Lam.

Synonym ▶ *S. cordata* (Burm. f.) Borssum.
S. humilis Cav.

Family ▶ *Malvaceae*.

Habitat ▶ Throughout hotter parts of India.

Ayurvedic ▶ Raajabalaa, Bhumibalaa, Prasaarini, Suprasaraa (also equated with Naagabalaa, *Grewia hirsuta*).

Siddha/Tamil ▶ Palampasi.

Folk ▶ Farid-booti.

Action ▶ Fruits and flowers—used for burning sensation in micturition. Leaves—juice, used for diarrhoea; poultice applied to cuts and bruises. Root bark—used for leucorrhoea and genitourinary affections.

In experimental animals, the herb prevented arthritic swellings.

The plant contains beta-phenethylamines, quinazoline, carboxylated tryptamine, linoleic acid, malvalic acid, sterculic acid and gossypol.

Dosage ▶ Root—10–20 ml juice; 50–100 ml decoction. (CCRAS.)

Siegesbeckia orientalis Linn.

Family ▶ *Compositae; Asteraceae.*

Habitat ▶ Throughout India up to 2,000 m.

English ▶ The Holy Herb, Siegesbeckia.

Siddha/Tamil ▶ Katampam, Kadambu.

Folk ▶ Pili-badkadi (Gujarat), Latlatiaa (Bihar), Lichkuraa (Garhwal).

Action ▶ Plant—antiscorbutic, sialogogue, cardi tonic, diaphoretic. Used for the treatment of rheumatism, renal colic and ague. Also used as a lotion for gangrenous ulcers and sores, syphilis, leprosy, ringworm.

The aerial parts contain sesquiterpene lactone, orientin; melampolides including orientolide; diterpene, drугtenol and the corresponding glucoside darutoside. The whole plant, in addition, gave 3,7-dimethylquercetin.

The plant exhibited antiviral, CVS active, spasmolytic and hypoglycaemic activity.

Silybum marianum (L.) Gaertn.

Family ▶ *Compositae; Asteraceae.*

Habitat ▶ Western Himalayas at 1,800 and Kashmir at 2,400 m, also grown in gardens.

English ▶ Holy Thistle, Milk Thistle.

Action ▶ Seeds—liver protective, gallbladder protective, antioxidant. Used in jaundice and other biliary affections, intermittent fevers, uterine trouble, also as a galactagogue. Alcoholic extract used for haemorrhoids and as a general substitute for adrenaline. Seeds are used for controlling haemorrhages. Leaves—sudorific and aperient. Young leaves and flowering heads are consumed by diabetics.

Key application ▶ In dyspeptic complaints. As an ingredient of formulations for toxic liver damage; chronic inflammatory liver disease and hepatic cirrhosis induced by alcohol, drugs or toxins. (*Expanded Commission E Monographs, WHO.*)

The seeds gave silymarin (flavanol lignin mixture), composed mainly of silybin A, silybin B (mixture known as silibinin), with isosilybin A, isosilybin B, silychristin, silydianin. In Germany, Milk Thistle has been used extensively for liver diseases and jaundice. Silymarin has been shown conclusively to exert an antihepatotoxic effect in animals against a variety of toxins, particularly those of death cap mushroom, *Amanita phalloides*. Silybin, when given by intravenous injection to human patients up to 48 hours after ingestion of the death cap, was found to be highly effective in preventing fatalities.

Silymarin has been used successfully to treat patients with chronic hepatitis and cirrhosis; it is active against hepatitis B virus, and lowers fat deposits in the liver in animals.

(For hepatic cirrhosis: 420 mg per day; for chronic active hepatitis 240 mg twice daily—extract containing 70–80% silimarin.)

Sisymbrium irio Linn.

Family ▶ *Cruciferae; Brassicaceae.*

Habitat ▶ Kashmir, Punjab, Haryana and from Rajasthan to Uttar Pradesh in moist soils.

English ▶ London Rocket.

Ayurvedic ▶ Khaaksi.

Unani ▶ Khuubkalaan.

Action ▶ Seeds—expectorant, restorative, febrifuge, rubefacient, antibacterial. Used in asthma.

Leaves—rich in vitamin C (176 mg/100 g), beta-carotene (10,000 IU/100 g) and minerals. Used in throat and chest infections.

Aerial parts yield beta-sitosterol, 3 beta-D-glucoside, isorhamnetin and quercetin.

The seed contains a flavonoid, *isorhamnetin*. Fatty oil from seeds contain linolenic and oleic acids (as chief constituents), along with erucic, palmitic and stearic acids.

Ethanollic extract of seeds exhibited marked antibacterial action, also antipyretic and analgesic effects.

S. loeselii Linn. (Kashmir and Himachal Pradesh) is used in scrofula and

as an antiscorbutic. The seed oil contains erucic acid and larger amounts of tetracosenoic acid. The plant contains alkaloids, organic acids, tannins, glycosides, saponins, coumarins and flavonoids.

Smilax aristolochiaefolia Miller.

Family ▶ *Liliaceae; Smilacaceae.*

Habitat ▶ Native to tropical America and the West Indies.

English ▶ Sarsaparilla.

Unani ▶ Ushbaa Maghrabi (Ushbaa Desi is equated with *Decalepis hamiltonii*.)

Action ▶ Alterative, anti-inflammatory, antipruritic, blood purifier, antiseptic. (It was first introduced in 1563 as a drug for syphilis.)

In Western herbal, Sarsaparilla is equated with *Smilax aristolochiaefolia* (American, Mexican, Vera Cruz or Grey Sarsaparilla); *S. medica*, *S. regelii* (Jamaican, Honduras or Brown Sarsaparilla); *S. febrifuga* (Ecuadorian or Guayaquil Sarsaparilla). *Hemidesmus indicus* is equated with Indian Sarsaparilla.

Key application ▶ Preparations of sarsaparilla root are used for skin diseases, psoriasis and its sequel, rheumatic complaints, kidney diseases, and as a diaphoretic and diuretic. (The claimed efficacy has not been established clinically.) Included among unapproved herbs by *German Commission E*.

The roots and rhizomes of sarsaparilla contain saponins based on aglycones sarsapogenin and smilagenin, the major one being parillin (sarsaponin), with smilasaponin (smilacin) and sarsaparilloside; beta-sitosterol, stigmasterol and their glucosides. Chief components of saponins (0.5–3%) are sarsaparilloside, along with parillin as a breakdown product. Parillin shows antibiotic activity.

Sarsaparilla root sterols are not anabolic steroids, nor are they converted *in vivo* to anabolic steroids. Testosterone, till now, has not been detected in any plant including sarsaparilla. *Hemidesmus indicus* contains none of the saponins or principal constituents found in sarsaparilla. (*Natural Medicines Comprehensive Database*, 2007.)

Smilax aspera Linn.

Family ▶ *Liliaceae*.

Habitat ▶ The tropical and temperate regions, from Kashmir, Sikkim and Assam to South India.

English ▶ Italian Sarsaparilla.

Action ▶ Roots used as a substitute for *Hemidesmus indicus*. Rutin has been isolated as a major flavonoid from the plant.

Smilax china Linn.

Family ▶ *Liliaceae*.

Habitat ▶ Japan, China and Cochin China.

English ▶ China Root.

Ayurvedic ▶ Chobachini, Chopachini, Dweepaanter-Vachaa, Madhusnuhi, Hrididhaatri.

Unani ▶ Chobchini.

Siddha/Tamil ▶ Parangi chakkai.

Action ▶ Tubers—used as alterative in venereal diseases, chronic skin diseases and rheumatic affections. Used as official sarsaparilla. (China of homoeopathic medicine is Peruvian bark, not *Smilax china*.)

Sarsaparilla (*Smilax* species) is used in Oriental as well as in Western herbal for its alterative, gentle circulatory stimulant and mild testosterone activity.

The root is known for its steroidal saponins. Pro-sapogenin-A of dioscin, dioscin, gracillin. Me-protogracillin, Me-protodioscin and its 22-hydroxy-analog; besides beta-sitosterol glucoside, smilaxin, two furostan and one spirostane glycosides have been isolated from the root.

Dosage ▶ Root—50–100 mg powder. (CCRAS.)

Smilax glabra Roxb.

Family ▶ *Liliaceae*.

Habitat ▶ Assam, Khasi and Garo Hills, eastwards to upper Burma, Indo-China and southern China.

Ayurvedic ▶ Dweepaantera-Vachaa, Chobachini (bigger var.).

Action ▶ Roots—used for syphilis, venereal diseases and sores, as a blood purifier.

Astilbin, 3-O-caffeoyl-shikimic, ferulic, palmitic, shikimic and succinic acids; engeletin, isoengeletin; glucose; daucosterol, beta-sitosterol, stigmasterol are major constituents of the root.

Crude saponins, isolated from the plant, produced preventive effect on cholesterol-fed atherosclerosis in quails.

Smilax lanceifolia Roxb.

Family ▶ *Liliaceae*.

Habitat ▶ Sikkim Himalayas, Assam and Manipur.

Ayurvedic ▶ Hindi Chobachini.

Folk ▶ Shukchin (Maharashtra), Hariaa.

Action ▶ Roots—used for rheumatic affections.

Smilax ornata Hook.

Family ▶ *Liliaceae*.

Habitat ▶ Tropical Himalayas from Kumaon eastwards to Khasi, Garo and Naga Hills, and in Bihar.

Unani ▶ Ushbaa. (Jamaica sak-saparilla.)

Action ▶ Roots—used as a blood purifying drug.

Smilax ovalifolia Roxb.

Synonym ▶ *S. macrophylla* Roxb.

Family ▶ *Liliaceae*.

Habitat ▶ Tropical parts of India.

Ayurvedic ▶ Maitri.

Unani ▶ Ushbaa (wild species).

Folk ▶ Ghot-vel (Maharashtra).

Action ▶ Roots—used as a substitute for *Hemidesmus indicus*. Used for venereal diseases, urinary infections, rheumatism. Also used for dysentery. (*S. perfoliata* Lour., synonym *S. prolifera* Roxb. is used as a substitute for *S. ovalifolia*.)

Smilax zeylanica Linn.

Family ▶ *Liliaceae*.

Habitat ▶ Tropical parts of India including hills. Common in eastern Himalayas.

Unani ▶ Jangali Ushbaa.

Siddha/Tamil ▶ Malai-thaamara.

Action ▶ Root—used in prescriptions for venereal diseases. Decoction, used for abscesses, boils, swellings and rheumatism; also for dysentery. Used as a substitute for *S. ornata*.

Diosgenin is reported from the root and leaf.

Solanum aculeatissimum Jacq.

Family ▶ *Solanaceae*.

Habitat ▶ Assam and Kerala, in damp and waste places.

Ayurvedic ▶ Brihati (related species, used in Kerala). Brihati and Kantakaari have been used in Indian medicine as synonyms.

Action ▶ Both fruit and leaves contain glycoalkaloid solanine; immature fruits contain more of it than the ripe ones. Air-dried leaves and fruits contain 0.26 and 0.14% of alkaloids, respectively.

See *S. indicum* Linn.

Solanum albicaule

Kotschy ex Dunal.

Family ▶ *Solanaceae*.

Habitat ▶ Saurashtra (Gujarat) and Rajasthan.

Ayurvedic ▶ Brihati (related species).

Folk ▶ Narkanta (Rajasthan).

Action ▶ A decoction of the plant is prescribed for the treatment of ulcers.

See *S. indicum* Linn.

Solanum aviculare Forst. f.

Family ▶ *Solanaceae*.

Habitat ▶ Introduced to Kashmir for experimental cultivation.

Ayurvedic ▶ Kantakaari (related species).

Action ▶ An important source of solasodine, a nitrogen analogue of diosgenin and one of the starting materials for the synthesis of corticosteroids and other steroidal hormones.

See *S. xanthocarpum*.

The leaves, stems, flowers and green fruits contain the glycoalkaloid, solasonine, of which solasodine is the aglycone. Besides solasonine, the plant

contains solamargine and solasodamine. The average alkaloidal content (calculated as solasodine) of leaves collected from Kashmir, is reported to be 0.3% (dry weight basis).

Solanum dubium Fresen.

Family ▶ *Solanaceae*.

Habitat ▶ Sandy coast of Saurashtra (Gujarat).

Ayurvedic ▶ Kantakaari (related species).

Action ▶ Seeds are soaked and eaten in Africa for the treatment of venereal diseases.

See *S. xanthocarpum*.

Solanum dulcamara Linn.

Family ▶ *Solanaceae*.

Habitat ▶ The temperate Himalayas from Kashmir to Sikkim at altitudes of 1,200–2,400 m.

English ▶ Woody Night Shade, Bittersweet, Bitter Nightshade, Felonwort.

Ayurvedic ▶ Kaakamaachi-vishesha, Valli-kantakaarikaa.

Unani ▶ Mako (red var.).

Action ▶ Twigs and root bark—stimulating, expectorant, hepatic, astringent, antirheumatic, alterative, antifungal. Dried branches—sedative and analgesic. Used for chronic bronchitis, chronic eczema and rheumatism.

Key application ► As a supportive therapy for chronic eczema. (*German Commission E.*)

The plant is rich in alkaloidal glycosides. Alpha-, beta-, gamma-solamarine were isolated from the fruits. Tomatidenol I existed in the plant as alpha and beta-solamarine. Solasodine was obtained in traces as secondary alkaloid; it existed as solasonine and solamargine. Aerial parts gave alpha and beta-soladulcine, the glycoalkaloids. The sterols were present in free form and as esters, glucosides and palmitic esters of glucosides.

Beta-solamarine shows significant tumour-inhibiting activity. Steroidal saponins are antifungal; alkaloids are anticholinergic; solasodine exhibit antiplophlogistic activity.

Solanum elaeagnifolium Cav.

Family ► *Solanaceae*.

Habitat ► Native to tropical America; naturalized in India as a weed (met with in cultivated fields and gardens in Coimbatore).

English ► White Horse-Nettle.

Action ► Plant—used as a poultice for sores and ulcers. The plant is a rich source of the steroidal alkaloid, solasodine. The fruit and leaves contain 3–4% (solasodine 3.2%) and 0.18% total alkaloids. Fruits also contain 0.55% diosgenin.

A related species *S. khasianum* (Assam, Sikkim, West Bengal, Orissa and the Nilgiris, ascending to an altitude of

1,600 m) is also a good source of solasodine. The fruits collected from Nilgiris contain 5.4% solasodine on dry weight basis.

Solanum erianthum D. Don.

Synonym ► *S. verbascifolium* auct. non Linn.

Family ► *Solanaceae*.

Habitat ► The tropical and subtropical India and the Andamans. Cultivated in South India. (for berries).

Folk ► Chundai (Tami Nadu, Kerala); Rasagadimaanu (Andhra Pradesh); Sowdangigida, Kadusinde (Karnataka); Kutri (Maharashtra). Vidaari is a confusing synonym (used by *The Wealth of India*). (Vidaari is equated with *Pureraria tuberosa*.)

Action ► Roots—a decoction is prescribed for vertigo. Leaves—prescribed for vaginal discharges. Various plant parts are ground with warm water and applied externally to lessen inflammation, burning sensation and pain. The glycoalkaloid, solasonine is present in the leaves and fruits.

Solanum ferox Linn.

Family ► *Solanaceae*.

Habitat ► Throughout warmer parts of India, up to an elevation of 1,500 m.

English ► Poison-Berry.

Ayurvedic ▶ Brihati, Brihatikaa, Mahati, Hinguli, Prasaha, Vartaki, Kaantaa, Kshudra-bhantaki, Simhi, Bana-bhantaa. Kateri (bigger var.)

Unani ▶ Katai Kalaan.

Siddha/Tamil ▶ Mulli, Pappara-mulli, Karimulli.

Folk ▶ Raam-begun (Bengal).

Action ▶ Plant and root—stimulant, digestive, carminative, astringent, expectorant, diaphoretic, anthelmintic. Used for catarrhal affections, asthma, dry cough; dysuria; intestinal worms; colic, flatulence, vomiting. Berries—used in asthma and rheumatism.

Air-dried fruits and leaves contain solanine; 0.30 and 0.43% of total alkaloids respectively.

Dosage ▶ Fruit, root—3–6 g powder; 50–100 ml decoction. (CCRAS.)

Solanum indicum Linn.

Family ▶ Solanaceae.

Habitat ▶ Throughout India in the plains and foot hills.

English ▶ Poison Berry.

Ayurvedic ▶ Brihati, Kshudra-bhantaaki, Kateri (bigger var.).

Unani ▶ Hadaq, Kataai Kalaan.

Siddha ▶ Mullamkatti, Papparamulli (root).

Folk ▶ Barahantaa.

Action ▶ Root—carminative, expectorant; used for colic, dysuria, coughs and catarrhal affections.

A decoction is prescribed in difficult parturition.

The fruits and leaves contain glycoalkaloid, solasonine; the presence of solanine in roots, leaves and fruits has been reported. Diosgenin is also present in leaves, stems and fruits.

The total alkaloid content of fruit varies from 0.2 to 1.8% (dry weight basis); plants growing in Jammu and Kashmir bear fruits with high alkaloid content (total alkaloid 1.8%).

An alcoholic extract of fruits is active against *Staphylococcus aureus* and *E. coli*. The extract of leaves is also active against *E. coli*.

The bigger var. of Kateri (Indian Nightshade) is also equated with *S. anguivi* Lam., synonym *S. indicum* auct. non L. It contains salasonine, diosgenin, beta-sitosterol, lanosterol, solamargine, solasodine and tomatidenol. The seed oil contains carpestrol.

Dosage ▶ Root—10–20 g for decoction. (API, Vol. II.)

Solanum melongena Linn.

Family ▶ Solanaceae.

Habitat ▶ Native to India; cultivated throughout India.

English ▶ Eggplant, Brinjal.

Ayurvedic ▶ Bhantaki, Bhantaa, Vaartaaka, Vaartaaku, Vaartaakini, Vrintaaka.

Unani ▶ Baingan.

Siddha/Tamil ▶ Kathirikai.

Folk ▶ Baingan, Bhantaa.

Action ▶ Fruit—recommended in liver complaints and for amenorrhoea. The fruit is reported to stimulate the intrahepatic metabolism of cholesterol, produces a marked drop in blood cholesterol level. Aqueous extract of fruit is reported to inhibit choline esterase activity of human plasma. Root—anti-asthmatic. Leaves—toxic; used mostly externally for the treatment of burns, cold sores and abscesses. Seeds—anticholesterolemic.

Steroidal saponins, melongosides were isolated from seeds; tigogenin, diosgenin were also obtained. Quercetin, 3-O-rhamnoside and kaempferol-3-O-rutinoside have been isolated from the leaves. The ethanol extract (80%) showed anti-inflammatory activity in paw oedema and cotton pellet method in rats. Crude extract of fruits showed diuresis and dose-dependent hypotensive response in normotensive rats. Ether-soluble methanolic extract exhibited strong inhibitory activity on lipoxygenase, involved in atherosclerotic processes and platelet aggregation in rats.

Solanum melongena Linn. var. *incanum* Kuntze, synonym *S. coagulans* Forsk. is known as Bana-bhantaa (also a synonym of *Solanum ferox*) and is used as Brihati in Kerala. Air-dried fruits and leaves from coimbatore contain 1.05 and 0.97% of alkaloids respectively. The fruits contain solasodine, campesterol and beta-sitosterol. Solamargine, solasodine, ursolic acid and its derivatives exhibited significant cytotoxic effects against human P2C/PRF/5 cells *in vitro*.

Solanum nigrum Linn.

Synonym ▶ *S. rubrum* Mill.

Family ▶ *Solanaceae*.

Habitat ▶ Throughout India, in dry parts, up to an elevation of 2,100 m.

English ▶ Black Nightshade.

Ayurvedic ▶ Kaakamaachi, Kaakaahya, Kaakamaataa, Dhvankshamaachi.

Unani ▶ Mako (smaller var., black var.)

Siddha/Tamil ▶ Manittakkali.

Action ▶ Plant—anti-inflammatory, antispasmodic, sedative, diuretic, laxative, antiseptic; fresh extract is used for inflammatory swellings, enlargement of liver and spleen and in cirrhosis of liver. Berries—antidiarrhoeal, antipyretic. Berries and flowers—prescribed in cough and cold. Leaves—applied hot to swollen testicles; paste used as poultice to gout, rheumatic swellings and skin diseases.

The berries contain steroidal alkaloid glycosides, solasonine, alpha- and beta-solanigrine, alpha- and beta-solamargine; steroidal saponins, diosgenin and tigogenin; solasodine and solasodine.

Solamargine and solasonine are present also in leaves. The total alkaloid content of fruits and leaves are 0.101 and 0.431% respectively.

Dosage ▶ Whole plant—5–10 ml juice. (API, Vol. II.)

Solanum spirale Roxb.

Family ▶ *Solanaceae*.

Habitat ▶ Assam, Khasi Hills. Banga (Bengal); Titakuchi (Assam); Soh-jhari (Khasi); Mungas-kajur (root, Bihar).

Action ▶ Root—diuretic, narcotic. Unripe berries—poisonous.

The leaves contain 1.29% alkaloids. Partial synthesis of etiolin has been reported.

Solanum torvum Sw.

Family ▶ *Solanaceae*.

Habitat ▶ Throughout tropical parts of India, in waste places.

English ▶ West Indian Turkey Berry.

Ayurvedic ▶ Brihati (White-flowered-var.), Goshtha-vaartaaku.

Siddha/Tamil ▶ Chundai.

Folk ▶ Ran-Baingan, Goth-begun.

Action ▶ Plant—digestive, diuretic, sedative. Leaves—haemostatic. Fruits—useful in liver and spleen enlargement (cooked and eaten as a vegetable); decoction used for cough. Root—used for poulticing cracks in feet.

Unripe fruits and leaves contain the glycoalkaloid, solasonine (0.37% total alkaloids in air-dried fruits of the plant from Khasi and Jaintia hills). Hydrolysis of the neutral glucosidal fraction yields a steroidal sapogenin, chlorogenin, which is rare in *Solanum* sp.

The fruits gave sitosterol-D-glucoside.

Extracts of the plant affect the rate and amplitude of respiration, also blood pressure. They also contract isolated ileum of guinea-pig. Leaves contain no vitamin K or derivatives of naphthoquinone; their haemostatic action may be due to the oil or pectins or both.

Solanum trilobatum Linn.

Family ▶ *Solanaceae*.

Habitat ▶ Deccan Peninsula.

English ▶ Climbing Brinjal.

Ayurvedic ▶ Alarka, Valli-kantakaarika, Kantakaari-lataa.

Siddha/Tamil ▶ Toothuvilai.

Action ▶ Berries and flowers—a decoction is used for cough and chronic bronchitis.

The steroidal alkaloid, solasodine, is present in fruit and leaf of the plant (air-dried fruits and leaves from Coimbatore gave 0.96 and 0.36% respectively). A crude glycoalkaloid mixture, isolated from the plant material, contained about 20% beta-solamarine. The plant exhibited antimutagenic, antitumour, antibacterial and antifungal activities and showed promising results in two cancer test systems—KB cell and sarcoma 180 in mice.

Solanum tuberosum Linn.

Family ▶ *Solanaceae*.

Habitat ▶ Native to South America; grown almost throughout India.

English ▶ Patoto.

Ayurvedic ▶ Aaluka, Aaruka, Golaalu. (Aaluka, yam of Indian medicine, is equated with species of *Dioscorea*.)

Folk ▶ Aaluu.

Action ▶ Potatoes are consumed as food. Extract of leaves is used as antispasmodic in cough. Potato juice is given as an adjuvant in the treatment of peptic ulcer for bringing relief from pain and acidity. Starch and very small quantities of atropine alkaloids reduce digestive secretions and stomach acids. Potatoes are good for patients suffering from hyperacidity; boiled potatoes make an excellent diet for those having hypertension.

Solanum xanthocarpum S. & W.

Synonym ▶ *S. surattense* Burm.f.
S. virginianum Linn.
S. maccanni Sant.

Family ▶ Solanaceae.

Habitat ▶ Throughout India.

English ▶ Wild Eggplant, Yellow-Berried Nightshade.

Ayurvedic ▶ Kantakaari, Kantakaarika, Vyaaghri, Nidigdhiaka, Nidigdhaa, Duhsparshaa, Dhaavani, Kshudraa, Keteri (Smaller var.), Bhatakataiyaa. Used as Lakshmana.

Unani ▶ Kataai Khurd, Hadaq.

Siddha/Tamil ▶ Kandankatthiri.

Action ▶ Stimulant, expectorant, diuretic, laxative, febrifuge. Used in the treatment of cough, bronchitis, asthma, for dislodging tenacious phlegm; also used against rheumatism, enlargement of liver and spleen, vomiting, difficult urination, bladder stones, skin diseases. Fruit—used as an adjuvant for promoting conception.

Fruits gave solasonine, solamargine, beta-solamargine and solasodine; petals yielded apigenin; stamens gave quercetin diglycoside and sitosterol. The glycoalkaloid content of fruits collected from Jammu and Kashmir is reported to be 3.5% (total alkaloids, 1.1%). The presence of diosgenin in the plant has been reported.

Both glycoalkaloid and fatty acid fractions of the plants extracts cause liberation of histamine from chopped lung tissue. The beneficial effect of the drug on bronchial asthma may be attributed to the depletion of histamine from bronchial and lung tissue.

Dosage ▶ Whole plant—20–30 g for decoction. (*API*, Vol. I.)

S

Solidago virga-aurea Linn.

Family ▶ Compositae; Asteraceae.

Habitat ▶ The temperate Himalayas from Kashmir eastwards and in Khasi Hills, up to 3,000 m.

English ▶ European Goldenrod, Woundwort.

Action ▶ Anticatarrhal, diaphoretic, anti-inflammatory, antiseptic to mucous membranes.

Key application ► In irrigation therapy for inflammatory diseases of the lower urinary tract, urinary calculi and kidney gravel. (*German Commission E.*) ESCOP also indicates its use as an adjuvant in the treatment of bacterial infections of the urinary tract.

Anti-inflammatory activity is due to phenolic glycosides; antifungal activity is due to saponins based on polygalic acid (acts specifically against the *candida* fungus, the cause of vaginal and oral thrush). As a diuretic, aerial parts are used for nephritis and cystitis and to flush out kidney and bladder stones; urine volume is increased but not sodium excretion.

The plant contains quercitrin, rutin, iso-quercitrin, astragalin, kaempferol, rhamnoglucoside, quercetin, caffeic acid and chlorogenic acid. Aerial parts contain diterpenoids of *cis*-clerodane lactone group.

Sonchus arvensis Linn.

Family ► *Compositae; Asteraceae.*

Habitat ► Waste places and fields throughout India, up to an altitude of 2,400 m.

English ► Corn Sow Thistle.

Ayurvedic ► Sahadevi (bigger var.). (*Vernonia cinerea* is equated with Sahadevi.)

Action ► Plant—sedative, hypnotic, anodyne, expectorant, diuretic. Used for nervous debility. Seeds—used for asthma, bronchitis, cough, pertussis, fever; decoction in

insomnia. Leaves—applied to swellings. Root—used for diseases of the respiratory tract.

The plant contains amino acids, lipids, polymeric hydrocarbons, polyphenols, protein; alpha- and beta-amyrins, lupeol, pseudotaraxasterol, taraxasterol. The latex contains mannitol, alpha- and beta-lactuceros. Aerial parts and fruits contain ceryl alcohol, choline, palmitic, tartaric and stearic acids.

Sonchus asper Hill

Family ► *Compositae; Asteraceae.*

Habitat ► Waste places and fields throughout India, up to elevation of 3,600 m.

English ► Spiny-leaved Sow Thistle.

Ayurvedic ► Sahadevi (bigger var.).

Folk ► Didhi, Mhaataaraa (Maharashtra).

Action ► Emollient. Pounded and applied to wounds and boils.

The latex contains rubber, alpha- and beta-lactuceros, ceryl alcohol, mannitol and traces of acetic acid. The whole plant contains the sesquiterpene glycosides and ionone glycosides. Ascorbic acid (27 mg/100 g) is present in the plant.

Sonchus oleraceus Linn.

Family ► *Compositae; Asteraceae.*

Habitat ► Waste places throughout India, up to elevation of 2,400 m.

English ▶ Milk Thistle (a confusing synonym. *Silybum marianum* has been equated with Milk Thistle.)

Folk ▶ Duudhi, Dodaka, Dudhaali.

Action ▶ Galactagogue, febrifuge, sedative, vermifuge. Used in indigestion and in the treatment of diseases of the liver. An ointment is made from the decoction for wounds and ulcers.

The leaves contain luteolin, luteolin-7-O-glucoside; hydroxycoumarins, cichoriin and scopoletin. Apigenin-7-O-glucoside was also obtained from the leaves and stems. Young leaves are reported to contain 4.1 mg/100 g of vitamin C.

Sonneratia caseolaris Engl.

Family ▶ *Sonneratiaceae*.

Habitat ▶ Tidal creeks and mangrove swamps of India.

Folk ▶ Orchaa (Bengal), Tivar, Chipi (Maharashtra).

Action ▶ Fruit—fermented juice is used for arresting haemorrhage. Juice of unripe fruit is given in cough. Fruit is also used as a poultice in sprains and swellings. Fruit wall—vermifuge.

The stem bark and root bark contain 9–17 and 11.0 to 11.9% tannin of the pyrogallol class.

The fruit yields 11% pectin on dry basis.

Sophora japonica Linn.

Family ▶ *Papilionaceae*, *Fabaceae*.

Habitat ▶ Kashmir; also introduced into forest Research Institute, Dehra Dun.

English ▶ Japanese Pagoda tree, Chinese Scholar tree, Umbrella tree.

Action ▶ Flower—bitter, astringent, styptic, antibacterial.

Flower buds are a very rich source of rutin (16.0–23.0% dry weight basis), several times more than that present in Buckwheat which is an important source of the flavonoid.

The plant is used for the treatment of bleeding due to hemorrhoids and ulcerative colitis. The antihaemorrhagic principle, quercetin, has been isolated from aqueous extract of dried buds.

The flower extract has been reported to exhibit hepato-protective activity.

Sophora mollis Grah. ex Baker.

Synonym ▶ *Edwardsia moltis* Royle.

Family ▶ *Papilionaceae*; *Fabaceae*.

Habitat ▶ Himalayas from Kashmir to Nepal, up to an altitude of 2,100 m.

English ▶ Himalayan Laburnum.

Action ▶ Seeds—used for destroying vermin. Root—used for promoting hair growth.

The seeds contain an alkaloid cytisine. The root imparts dark colour to hair.

The seeds of *S. secundiflora* Lag. ex DC., known as Mescal-or Coral-Bean (Native to America, grown in Indian gardens) also contain substantial amounts of cytisine.

The alkaloid, (-)-N-methylcytisine, isolated from the seeds, exhibited hypoglycaemic activity in mice.

Sophora tomentosa Linn.

Family ▶ *Popilionaceae; Fabaceae.*

Habitat ▶ Grown in gardens for its bright-yellow flowers.

English ▶ Sea coast Laburnum, Silver Bush.

Action ▶ Seeds—dangerously emetocathartic, toxic, febrifugal, stomachic. Seeds yield a fatty oil with expectorant properties. Decoction of seeds and roots is given in bilious disorders. Leaves—emetocathartic.

Constituents of the aerial parts include benzofurans; flavonoids including sophoraisoflavone A and B, sophoranol, *iso*-sophoranone and *iso*-bavachin. The leaves and seeds contain alkaloids—matrine, cytisine and small amounts of methylcytisine. Cytisine is also present in the roots.

Cytisine possesses insecticidal and physiological properties similar to those of nicotine.

Sophoraisoflavone A exhibits antifungal activity.

Sopubia delphinifolia G. Don.

Family ▶ *Scrophulariaceae.*

Habitat ▶ Western India, as a root parasite.

Folk ▶ Dudhaali (Maharashtra).

Action ▶ Root—juice applied to sores on feet, caused by constant exposure to water and moisture.

Alcoholic extract of air-dried powdered stems yielded isoflavonoids, which were found to be estrogenically active in albino rats.

Sorbus aucuparia Linn.

Family ▶ *Rosaceae.*

Habitat ▶ Native to Europe and Asia; distributed in temperate Himalayas from Kashmir to Kumaon.

English ▶ European Mountain Ash, Rowan tree, Mountain Ash Berry.

Folk ▶ Battal (Punjab), Syaar (Garhwal).

Action ▶ Fruits—antiscorbutic, depurative, diuretic, astringent, aperient, emmenagogue. An infusion is given in haemorrhoids, strangury and irritation of bladder; for disorders of the uric acid metabolism, for dissolution of uric acid deposits; and for alkalization of the blood (“blood purification”). (Seeds contain cyanogenic acid; should be removed before the fruit is used.) Leaves—laxative; used as a pectoral in cough and bronchitis. Bark—astringent. Decoction is given in diarrhoea. (It is said to produce irritation of the alimentary mucous membrane.)

Included among unapproved herbs by *German Commission E*.

The fruit gave ursolic acid, parasorboside, quercetin, iso-quercetin, rutin and anthocyanins.

Candied fruit may contain 30–40 mg/100 g of vitamin C and concentrates up to 240 mg/100 g. Fresh fruit contains vitamin C 39–74 mg, carotene 6.2–9.8 mg/100 g.

Amygdalin (34.27–61.70 mg/100 g) and hydrocyanic acid (2.02–3.72 mg/100 g) are reported to be present in frozen fruit.

Leaves, buds, young twigs and bark contain amygdalin; tannin (4.47%); triterpenoids; sorbose, sorbitol and sorbic acid.

Sorghum vulgare (Linn.) Pers.

Synonym ▶ *Andropogon sorghum* Brot.

Family ▶ *Gramineae; Poaceae*.

Habitat ▶ Cultivated throughout warmer parts of India.

English ▶ Sorghum, Broomcorn.

Ayurvedic ▶ Yaava-naala.

Siddha/Tamil ▶ Makkaseelam.

Folk ▶ Jowaar, Paneraa.

Action ▶ Grains—demulcent, diuretic. A confection of grains and *Foeniculum vulgare* seeds is used as a galactagogue. Sorghum is inferior to wheat.

About 80% of sorghum in India belongs to the race *Durra* (*Sorghum durra* (Forsk.) Stapf.).

Soymida febrifuga A. Juss.

Family ▶ *Meliaceae*.

Habitat ▶ Peninsular India, Rajasthan and Bihar.

English ▶ Indian Red-Wood, Bastard Cedar.

Ayurvedic ▶ Maansrohini, Rohini, Rohinaa, Prahhaarvalli.

Siddha/Tamil ▶ Somi-maram, Wond.

Action ▶ Bark—antipyretic (particularly prescribed in malaria), bitter tonic in general debility, astringent (used for diarrhoea and dysentery); used as a gargle in stomatitis, applied to rheumatic swellings. The bark is much inferior to cinchona bark, but a good substitute for oak bark.

The plant contains mainly tetranor-triterpenoids and flavonoids. The heartwood gave febrifugine A and B, febrinins A and B; flavonoids—naringenin, quercetin, myricetin and dehydromyricetin. The Root heartwood yielded sitosterol, obtusifoliol, syringetin and dihydrosyringetin. The bark contains tetranor-triterpenoids with modified furan ring.

Petroleum ether extract of the bark yielded a steroid, methyl angolensate, ether extract yielded a steroid glycoside.

Dosage ▶ Bark—3–5 g powder. (CCRAS.)

Spathodea campanulata Beauv.

Family ▶ *Bignoniaceae*.

Habitat ▶ Native to tropical Africa.

Grown as a avenue tree, in Coffee estates for shade.

English ▶ Syringe tree, Fountain tree, African Tulip tree.

Siddha/Tamil ▶ Patadi.

Folk ▶ Ruugatuuraa.

Action ▶ Bark—decoction given for dysentery, gastro-intestinal and renal ailments. Pulverized bark applied to skin diseases. Leaves—infusion administered for urethral inflammation.

The stem bark gave oleanolic and siaresinolic acids. The bark yields small quantities of tannin. Leaves gave caffeic and chlorogenic acids, quercetin-3-galactoside. Flowers gave malvidin and pelargonidin diglycoside.

An aqueous alcoholic extract of the leaves and the hexane and chloroform extracts of stem bark showed anti-malarial activity.

S

Spergularia rubra

(Linn.) J. Persl & C. Persl.

Synonym ▶ *Spergula rubra* D. Dietr.

Family ▶ *Caryophyllaceae*.

Habitat ▶ Native to Southern France and Malta; found in Punjab and Western Uttar Pradesh.

English ▶ Sand-Spurry, Sandwort, *Arenaria Rubra*.

Action ▶ Diuretic. Used in cystitis and urethral colic, dysuria and urinary calculi.

Spermacoce hispida Linn.

Synonym ▶ *Borreria articularis* (Linn. f.) F.N. Williams.

Borreria hispida (L.) K. Schum.

Spermacoce articularis L. f.

Family ▶ *Rubiaceae*.

Habitat ▶ The Himalaya, from Simla westwards to Assam and southwards to Kanyakumari.

Ayurvedic ▶ Madana Ghanti.

Siddha/Tamil ▶ Nellichoori.

Action ▶ Leaves—an extract is given as an astringent in haemorrhoids and gall stones. Seeds—demulcent; given in diarrhoea and dysentery. Root—prescribed as a mouthwash to cure toothache. A decoction of the herb is used in the treatment of headache.

The weed is rich in calcium and phosphorus; contains beta-sitosterol, ursolic acid and D-mannitol.

The plant gave alkaloid borreline, along with beta-sitosterol, ursolic acid and iso-rhamnetin.

Sphaeranthus indicus

Linn. (also auct. non L.)

Synonym ▶ *S. senegalensis* DC.

S. hirtus Willd.

Family ▶ *Compositae; Asteraceae*.

Habitat ▶ Tropical parts of India, in rice fields, cultivated lands as a weed.

Ayurvedic ▶ Mundi, Mundika, Munditika, Bhuukadamba, Alam-busta, Shraavani, Tapodhanaa.

(Mahamundi, Mahaa-shraavani is equated with *S. africanus* Linn.)

Unani ▶ Mundi.

Siddha/Tamil ▶ Kottakarthai.

Folk ▶ Gorakh-mundi.

Action ▶ Juice—styptic, emollient, resolvent. Also used in hepatic and gastric disorders. Seeds and root—anthelmintic. Decoction is used in cough and other catarrhal affections and chest diseases. Root bark—given in bleeding piles. Flowers—blood purifier, alterative, depurative.

The Ayurvedic Pharmacopoeia of India recommends the dried leaf in cervical lymphadenitis, chronic sinusitis, migraine, epilepsy, lipid disorders, diseases of spleen, anaemia, dysuria.

The drug is mostly administered in the form of its steam-distillate. Steam distillation of fresh flowering herb yields an essential oil containing methyl chavicol, alpha-ionone, *d*-cadinene, *p*-methoxycinnamaldehyde as major constituents. A bitter alkaloid, sphaeranthine, has been reported in the plant.

Capitula contains albumin, a fatty oil (up to 5%), reducing sugars, tannins, mineral matter, a volatile oil (0.07%), and a glucoside. No alkaloid was detected in the inflorescence. The glucoside on hydrolysis gave a aglycone, phenolic in nature. The unsaponifiable matter of the fatty oil showed beta-sitosterol, stigmasterol, *n*-triacontanol, *n*-pentacosane and hentriacontane. The essential oil is active against *Vibrio cholera* and *Micrococcus pyogenes* var. *aureus*. The

flower heads gave beta-D-glucoside of beta-sitosterol.

Eudesmanolides, cryptomeridiol and 4-epicryptomeridiol have been isolated from flowers.

Flowers gave a sesquiterpene glycoside, sphaeranthanolide, which exhibited immune stimulating activity.

Dosage ▶ Leaf—3–6 g (*API*, Vol III); whole plant—10–20 ml Juice (*API*, Vol. IV).

Spilanthes calva DC.

Synonym ▶ *S. acmella* auct. non (L.) Murr.
S. paniculata auct. non-DC.
S. pseudoacmella auct. non (L.) Murr.

Family ▶ *Asteraceae*.

Habitat ▶ Tropical and sub-tropical parts of India, in waste places and open moist fields.

English ▶ Paracress.

Ayurvedic ▶ Marahattikaa.

Folk ▶ Marethi, Desi Akarkaraa.

Action ▶ Plant—antidysenteric. Decoction, diuretic and lithotriptic, also used in scabies and psoriasis. Seeds—used in xerostomia, throat infections and neurological affection of tongue. Root—purgative.

Whole plant gave alpha- and beta-amyrin ester, myricyl alcohol, stigmasterol and its glucoside. A tincture made from flower heads is used as a substitute for the tincture of pyrethrum to treat inflammation of jaw-bones and caries.

Ethanollic extracts of the herb were found to affect the blood pressure of dogs and cats, and also the isolated ileum of guinea pigs. Spilanthol, obtained from the ether as well as pentane extracts, shows a strong sialogogic action, acts as a local anaesthetic and a powerful insecticide.

Spilanthes oleracea Murr.

Family ▶ *Compositae; Asteraceae.*

Habitat ▶ Introduced from Brazil; often cultivated in Indian gardens.

English ▶ Brazilian Cress, Para Cress.

Ayurvedic ▶ Mahaaraashtri, Marethi, Desi Akarkaraa. Aakaarakarabha of Ayurvedic medicine and Aaqarqarha of Unani medicine is equated with *Anacyclus pyrethrum* DC. (root is used); *S. acmella* and *S. oleracea* flowering heads are used as Desi Akarkaraa and should not be confused with the original drug.

Action ▶ Flowers—used against scurvy, gum troubles, toothache and against bladder pains and gout.

The flower heads yield 1.25% of spilanthol from the pentane extract.

The fresh plant yields an essential oil consisting mainly of spilanthol and a hydrocarbon, spilanthene. The plant also contains cerotic acid, crystalline phytosterols, tannic acid, resin, potassium malate and large amounts of choline and potassium nitrate.

Spinacia oleracea Linn.

Synonym ▶ *S. tetrandra* Roxb.

Family ▶ *Chenopodiaceae.*

Habitat ▶ Native to South-west Asia; cultivated throughout India.

English ▶ Garden Spinach.

Ayurvedic ▶ Paalankikaa, Paalankya, Paalakyaa.

Unani ▶ Paalak.

Siddha/Tamil ▶ Vasaiyila-keerai.

Action ▶ Seeds—cooling and laxative; given during jaundice. Spinach, as a potherb, is rich in nitrogenous substances, hydrocarbons and iron sesqui-oxide.

Aerial parts afforded rutin, hyperoside, astragalin and caffeic, chlorogenic, neochlorogenic and protocatechuic acids. Seeds contain glycoprotein-bound hexosamine. Roots contain spirasaponins.

Spondias pinnata (Linn. f.) Kurz.

Synonym ▶ *S. mangifera* Willd.

Family ▶ *Anacardiaceae.*

Habitat ▶ A small, aromatic tree occurring wild or grown throughout the country for edible fruits.

English ▶ Hog-Plum, Wild Mango. Great Hog-Plum is equated with *S. cytherea* Sonn, synonym *S. dulcis* Soland. ex Forst. f.

Ayurvedic ▶ Aamraataka, Aamraata, Aamadaa, Madhuparni, Kundalini, Kapitana, Markataamra.

Siddha/Tamil ▶ Mambulichi, Kattuma.

Folk ▶ Jangali Aam.

Action ▶ Fruits, leaves, bark—astrigent, antidysenteric, antiseptic, antiscorbutic. Bark paste applied externally to articular and muscular rheumatism. Root—used for regulating menstruation.

The Ayurvedic Pharmacopoeia of India recommends stem bark in haemorrhagic diseases.

The fruit contains beta-amyrin, oleonic acid and amino acids—glycine, cystine, serine, alanine and leucine; polysaccharides are also present.

Aerial parts gave lignoceric acid, 24-methylenecycloartanone, stigmast-4-en-3-one, beta-sitosterol and its glucoside.

Dosage ▶ Stem bark—5–10 g powder for decoction (*API*, Vol. II); 1–3 g powder (*API*, Vol. III).

Stachys palustris Linn.

Family ▶ *Labiatae; Lamiaceae.*

Habitat ▶ Kashmir, grows in damp places, at altitudes of 1,500–1,800 m.

English ▶ Marsh, Woundwort (purple-flowered), Allheal. (In Western herbal, Allheal is equated with *Prunella vulgaris*.)

Action ▶ Haemostatic, sedative, antiseptic, antispasmodic, vulnerary. Used for haemorrhages, gout, cramp, vertigo; applied as poultice to wounds.

The herb contains iridoids, harpagide and acetyl harpagide; flavonoids based on isoscutellarein and oroxylin A.

Stachys sylvatica Linn.

Family ▶ *Labiatae; Lamiaceae.*

Habitat ▶ Kashmir.

English ▶ Hedge Woundwort (reddish-purple-flowered).

Action ▶ See *S. palustris*.

The plant contains the alkaloids betonicine, turicine, stachydrine and trigonelline. Alcoholic and aqueous extracts of the plant cause contraction of isolated uteri of various animals. Betonicine has been shown to be haemostatic.

An allied species, *S. officinalis*, known as Betony in Europe, is an ageold headache remedy. It contains alkaloids (including stachydrine and betonicine), also saponins and tannins. The plant is mildly sedative and relieves nervous tension.

Stachytarpheta jamaicensis Vahl.

Synonym ▶ *S. indica* C. B. Clarke.

Family ▶ *Verbenaceae.*

Habitat ▶ Cultivated in gardens.

English ▶ Brazilian Tea, Bastard Vervain, Aaron's Rod.

Ayurvedic ▶ Kariyartharani.

Siddha/Tamil ▶ Simainayuruvi, Simainaivirunji, Naioringi.

Folk ▶ Chirchiti, Marang Chirchiti.

Action ▶ Febrifuge, anti-inflammatory. In Brazil, the plant is externally used for purulent ulcers and internally for rheumatic

inflammations and fever. An infusion of the bark is used against diarrhoea and dysentery.

The leaves contain friedelin, stigmasterol, ursolic acid, hispidulin, scutellarein, choline, phenolic acids, chlorogenic acid and flavonoids—6-hydroxyluteolol-7-glucuronide, luteolol-7-glucuronide and apigenol-7-glucuronide. Stems and leaves gave an iridoid glycoside, tarphetalin (ipolamide). The leaves are reported to be used for colds and cough.

Stellaria aquatica (L.) Scop.

Family ▶ *Caryophyllaceae*.

Habitat ▶ Temperate Himalayas from Kashmir to Uttar Pradesh at 1,200–2,400 m.

English ▶ Chickweed, Water Starwort.

Folk ▶ Budeolaa.

Action ▶ Leaves—decoction used in galactorrhoea.

Fresh plant contains an essential oil having 3-hydroxymethylfuran, alpha-pinene, limonene, *n*-hexanol, geraniol, camphor, benzyl alcohol, guaiaicol, cresol, eugenol and carvacrol as the major constituents.

Stellaria media (Linn.) Vill.

Synonym ▶ *Alsine media* Linn.

Family ▶ *Caryophyllaceae*.

Habitat ▶ Throughout India at 600–1,650 m.

English ▶ Common Chickweed.

Folk ▶ Kokoon (Jammu); Safed Fulki, Buchbuchaa (Delhi).

Action ▶ Antirheumatic, anti-inflammatory, astringent, refrigerant, demulcent, emollient, vulnerary, antipruritic. Disperses excessive body heat, relieves irritation. Used internally for rheumatism, externally in the form of ointment for chronic skin conditions, varicose ulcers and abscesses. Applied as a plaster for broken bones and swellings.

The plant contains saponin glycosides, coumarins, flavonoids (including rutin), carboxylic acid. The leaves contain vitamin C and carotene.

The plant also contains mucilage and is rich in potassium and silicon. The aerial parts, in post-flowering period, contain 44 mg/100 g of vitamin E.

Stephania glabra Miers.

Family ▶ *Menispermaceae*.

Habitat ▶ Himalayas from Simla to Sikkim, Khasi Hills and Assam.

Ayurvedic ▶ Used as Paathaa (*Cissampelos pareira*).

Folk ▶ Gidaangu (Garhwal), Paahraa (Dehradun).

Action ▶ Tubers—used in pulmonary diseases, asthma, intestinal disorders and hyperglycaemia.

Alkaloid palmitine exhibits antibiotic activity; stepharine anti-cholinesterase, cycleanine anti-inflammatory

and hyndarine sedative activity. Tetrahydropalmatine produces sedative and anticonvulsant effects on animals (similar but weaker to that of chlorpromazine). Alkaloids from rhizomes—hypotensive. Pronuciferine hydrochloride—spasmolytic. Root—hypoglycaemic, spasmolytic, CNS active, antimicrobial.

Stephania hernandiifolia Walp.

Synonym ▶ *S. japonica* Miers.
S. sotunda Hook. f. & Thorns.

Family ▶ *Menispermaceae*.

Habitat ▶ Forests of the Western and Eastern Ghats.

Ayurvedic ▶ Used as Raaj-Paathaa in the South. (Raaj-Paathaa is also equated with *Cyclea arnotii* Miers in southern and eastern parts of India).

Action ▶ Root—prescribed in skin diseases, pruritus, inflamed piles, internal abscesses, urinary diseases, vomiting, diarrhoea, colic, respiratory disorders and as a cardiotoxic.

The plant is rich in alkaloids. Aerial parts gave *epi*-stephanine (aknadine), hernandifoline, aknadinine and magnoflorine. Alkaloid aknadine shows significant antispasmodic activity on uterine spasms. Cytotoxic alkaloids include *d*- and *dl*-tetrandrine, *d*-isochondrodendrine and fangchinoline. The alkaloid, *epi*-stephanine (aknadine) possesses adrenergic neuron blocking activity.

Sterculia foetida Linn.

Family ▶ *Sterculiaceae*.

Habitat ▶ South India, also cultivated on roadsides.

Habitat ▶ The West Coast from Konkan southwards.

Siddha/Tamil ▶ Pinari, Kudirai Pidukku.

Folk ▶ Jangali Baadaam (in no way related to *Prunus amygdalus*).

Action ▶ Bark and leaf—aperient, diuretic. Fruit—astringent. Seed oil—carminative, laxative. Wood—antirheumatic. The wood, boiled with seed oil, is used externally in rheumatism.

Beans, called Java Olives, if taken in large quantities, cause nausea, act as violent purgative.

The leaves gave glucuronyl derivatives of procyanidin, scutellarein and luteolin; also taraxerol, *n*-otacosanol and beta-sitosterol. Lupenone, lupenol and betulic were obtained from the heartwood. Seed and root lipid contained cyclopropene fatty acids. Sterculic and malvalic acids show carcinogenic and co-carcinogenic activities.

Leucoanthoyanidin-3-O- α -L-rhamnopyranoside and quercetin rhamnoside have been isolated from the root.

Sterculia urens Roxb.

Family ▶ *Sterculiaceae*.

Habitat ▶ Rajasthan, Assam, Bihar, Uttar Pradesh, Madhya Pradesh, southwards to Western Peninsula.

English ▶ Karaya Gum.

Unani ▶ Gond Kateeraa (the authentic source is *Cochlospermum religiosum*).

Siddha/Tamil ▶ Kavalam.

Folk ▶ Karai, Kandol (Maharashtra, Gujarat).

Action ▶ Gum used as a substitute for tragacanth in throat affections.

The gum and mucilage contain aldobiuuronic and aldotriouronic acids.

The roots contains a coumarin, scopoletin.

The leaves afforded flavonol glycosides, quercetin and kaempferol derivatives; beta-amyrin, its acetyl derivative, beta-sitosterol and an ester of terephthalic acid. Stercurensin, a C-methylchalcone, has been isolated from the leaves.

The gum of *Sterculia villosa* Roxb. (Udall Wood) resembles with that of *S. urens*. Diometin and chrysoeriol and their 7-O-glucosides were isolated from the wood.

Kaama-duuti, Ativallabhaa, Taamrapushpi, Kuberaakshi. Amoghaa, Kumbhipushpi, Ambuvaasini. Copper-red-flowered var., known as Taamrapushpi, is equated with *S. suaveolens* (Paatalaa) and the white-flowered one with *S. chelonoides*. (Paatalai).

Siddha/Tamil ▶ Paadiri.

Action ▶ *The Ayurvedic Pharmacopoeia of India* recommends the root of Paatalaa in lipid disorders; the stem bark in oedema and retention of urine.

The white-flowered var. purifies blood, increases appetite and is prescribed for vomiting, hiccough, thirst, oedema and inflammatory chest diseases.

The copper-red-flowered var. is prescribed in difficult breathing, vomiting, oedema, flatus and high fever.

Ethanollic extract of the plant showed hypoglycaemic and anticancer activity experimentally.

A decoction of *S. personatum* root is prescribed for asthma and cough; of the leaves in chronic dyspepsia. A decoction of the root and leaves is credited with antipyretic properties. The bark exhibited antibacterial and antitubercular properties.

A decoction of *S. suaveolens* roots is prescribed for intermittent and puerperal fevers, inflammatory affections of the chest. Extracts of the plant contain lapachol.

The leaves of *S. chelonoides* contain a flavone, stereolensin. The bark gave an iridoid glycoside; the root bark gave *n*-triacontanol and beta-sitosterol; the root heartwood gave la-

S

Stereospermum personatum

(Hassk.) D. Chatterjee.

Synonym ▶ *S. Chelonoides* (Linn. f.) DC. (now *S. Colais*).
S. tetragonum A. DC.

Family ▶ *Bignoniaceae*.

Habitat ▶ Throughout India, especially in the moist regions.

English ▶ Trumpet Flower, Yellow Snake tree.

Ayurvedic ▶ Paatalaa, Paatali, Paatalai, Krishna-vrantaa, Madhu-duuti,

pachol, dehydro-alpha-lapachone and dehydrotectol. Ceryl alcohol, palmitic, stearic and oleic acids were isolated from the root. Lapachol exhibited cytotoxic activity.

Dosage ▶ Stem bark (white-flowered var.)—3–6 g powder. (*API*, Vol. IV.)
Root (red-flowered var.)—5–10 g powder. (*API*, Vol. III.)

Streblus asper Lour.

Synonym ▶ *Epicarpurus orientalis* Bl.

Family ▶ *Moraceae*.

Habitat ▶ Drier parts of Peninsular India.

English ▶ Siamee Rough Brush.

Ayurvedic ▶ Shaakhotaka, Shaakhotata, Pitaphalaka. Bhuutavaasa, Kharachhada.

Siddha/Tamil ▶ Piraayan, Pirai.

Folk ▶ Sihor.

Action ▶ Stem bark—febrifuge, antidiarrhoeal. Root—applied on inflamed swellings and syphilitic eruptions. Latex—applied on glandular swellings and elephantiasis.

The Ayurvedic Pharmacopoeia of India recommends the use of the stem bark in cervical lymphadenitis, also in lipid disorders.

The root bark contained cardenolide glycosides, including asperoside and strebloside; also yielded 6-deoxyallose. Stem bark yielded alpha-amyrin acetate, lupeol acetate, lupeol and beta-sitosterol.

Asperoside and strebloside exhibited antifilarial activity, former being

more effective. Crude extract is used for filaria.

The Central Drug Research Institute, Lucknow, has developed an antifilarial drug from the crude extract of stem. The stem bark is reported to cure filarial lymphangitis, lymphoedema, chyluria caused by filariasis.

Dosage ▶ Stem bark—1–3 g powder. (*API*, Vol. III.)

Striga asiatica (Linn.) Kuntze.

Synonym ▶ *S. lutea* Lour.

Family ▶ *Scrophulariaceae*.

Habitat ▶ Throughout the country and in the rainfed rice fields of Kerala.

Ayurvedic ▶ Agnivraksha, Kuranti.

Siddha/Tamil ▶ Pallipundu.

Folk ▶ Agiyaa.

Action ▶ Improves appetite and taste. Prescribed in strangury and diseases due to vitiated blood.

Striga gesneroides Vatke.

Synonym ▶ *S. orobanchioides* Benth.

Family ▶ *Scrophulariaceae*.

Habitat ▶ Western Peninsular India.

Folk ▶ Laal-giyaa.

Action ▶ Used in diabetes (in folk medicine). Hypoglycaemic activity, not confirmed.

Strobilanthes callosus Nees.

Synonym ▶ *Carvia callosa* (Nees) Bremek.

Family ▶ *Acanthaceae*.

Folk ▶ Maruaa-daanaa, Kaarvi (Maharashtra).

Action ▶ Bark—used in external applications for parotitis. Flowers—vulnerary. Leaves are poisonous.

Roots contain lupeol; the seeds are reported to contain brucine.

Strobilanthes flaccidifolius Nees.

Synonym ▶ *S. cusia* (Nees) Imlay.

Family ▶ *Acanthaceae*.

Habitat ▶ Assam, Meghalaya, West Bengal and Manipur.

English ▶ Assam Indigo.

Folk ▶ Ruum, Raampat (Assam); Khumaa (Manipur).

Action ▶ Leaves—astrigent, diuretic and lithotriptic.

The indican content of the leaves has been reported to be 0.4–1.3%. Lupeol, betulin, lupenone, indigo, indirubin, a quinazolinone and a quinazolinone have been isolated.

Strophanthus kombe Oliver.

Family ▶ *Apocynaceae*.

Habitat ▶ Native to tropical East Africa; runs wild at some places in West Bengal.

English ▶ Strophanthus.

Action ▶ Dry ripe seeds—cardiac glycosides (the mixture is known as Strophanthin-K) act like digitalis but are poorly absorbed from the digestive tract, are given by injection.

Strophanthus wightianus Wall. ex Wight, known as Nerivalli (Tamil) and Kambetti (Malyalam), is found along with western coast of Kerala.

The plant yields 2.1% of glycosides. The glycosides are known as cauloside and divaricoside, the corresponding genins are caudogenin and sarmen-togenin; the latter a precursor of cortisone. Studies have indicated that the tinctures prepared from the seeds compare favourably with those from the seeds of *S. kombe*.

Strychnos colubrina Linn.

Family ▶ *Loganiaceae*; *Strychnaceae*.

Habitat ▶ Deccan Peninsula from Konkan to Cochin.

Ayurvedic ▶ Kupilu-lataa, Kuchilaa-lataa.

Folk ▶ Kaajar-vel (Maharashtra).

Action ▶ Leaves and roots are boiled in oil and applied to rheumatic swellings. Wood—used for malarial fever and cutaneous eruptions. Root—purgative, febrifugal, anthelmintic.

The roots, wood, bark and seeds contain alkaloids (bark 5.54%, wood 0.96%), consisting of brucine and strychnine. Beta-sitosterol has been reported in the plant.

Strychnos ignatii Bergius.

Family ▶ *Loganiaceae; Strychnaceae.*

Habitat ▶ Native to the Philippines. Seeds are imported into India.

English ▶ Ignatus Beans.

Unani ▶ Papitaa Vilaayati. (Papitaa Desi is equated with *Carica papaya* Linn.)

Siddha/Tamil ▶ Kayappankottai.

Action ▶ Properties similar to those of *Nux vomica*. Used as a stimulant and nervine tonic, also for asthma and rheumatism.

The seeds contain indole alkaloids; brucine and its N-oxide, alpha- and beta-colubrine, diaboline, icajine, novacine, strychnine and its N-oxide, and 12-hydroxyderivatives, vomicine, and others. Share of strychnine is 45–60%, in indole alkaloids (2.5–5.6%).

Strychnos nux-vomica Linn.

Family ▶ *Loganiaceae; Strychnaceae.*

Habitat ▶ Tropical India up to an altitude of 360 m.

English ▶ *Nux vomica*.

Ayurvedic ▶ Kapilu, Kaakatin-duka, Kaakendu, Kaakapiluka, Vishamushtikaa, Vishamushti, Vishatinduka, Kuchilaa, Ksuchalaa.

Unani ▶ Azaraaqi, Kuchlaa.

Siddha ▶ Yettikkottai.

Action ▶ Nervine tonic and a potent CNS stimulant.

Seeds—used in emotional disorders, insomnia, hysteria, epilepsy, paralytic and neurological affections, retention or nocturnal incontinence of urine, spermatorrhoea, sexual debility and impotence, general exhaustion; as antidote to alcoholism; GIT disorders. Bark—juice given in acute dysentery, diarrhoea and colic. Root—given in intermittent fevers. In Chinese medicine a paste made of *Nux vomica* seeds is applied topically for treating facial paralysis.

Included among unapproved herbs by *German Commission E*.

The Ayurvedic Pharmacopoeia of India recommends detoxified seeds in paralysis, facial paralysis, sciatica and impotency.

The seeds contain indole alkaloids, the major one is strychnine (approx. 50% of the alkaloids); others include strychnine N-oxide, brucine and its N-oxide, alpha- and beta-colubrine, condylocarpine, diaboline, geissoschizine, icajine, isostrychnine, normacusine, novacine, pseudobrucine, pseudo-alpha-colubrine, pseudo-beta-colubrine, pseudostrychnine and vomicine (3-hydro-beta-colubrine). Loganin is also present. Pseudostrychnine is non-toxic. The alkaloidal content of the seeds ranges from 1.8 to 5.3%.

The leaves contain strychnine and brucine (together 1.6%), strychnine 0.025%; vomicine is the major constituent of leaves. The bark contains 9.9% total alkaloids (brucine 8%, strychnine 1.58%); pseudostrychnine, pseudobrucine and beta-colubrine in small amounts. The roots contain 0.99% alkaloids (brucine 0.28%, strychnine 0.71%).

Strychnine, when tested for anti-ulcer activity in shay rat model at a dose of 0.25 mg/kg body weight, complete absence of ulceration was observed which was comparable to cimetidine. Exhausted Nux-vomica powder at a dose of 20 mg/kg body weight, and brucine at a dose of 0.25 mg/kg body weight gave protection similar to strychnine.

Orally, 30–50 mg Nux-vomica (5 mg strychnine) is toxic.

Dosage ▶ Detoxified seed—60–125 mg. (*API*, Vol. IV.)

Strychnos potatorum Linn.f.

Family ▶ *Loganiaceae; Strychnaceae*.

Habitat ▶ Forests of West Bengal, Central and South India, up to 1,200 m.

English ▶ Clearing Nut tree.

Ayurvedic ▶ Kataka, Katakaphala, Payah-prasaadi, Chakshushya, Nirmali.

Unani ▶ Nirmali.

Siddha/Tamil ▶ Thettran, Thetrankottai.

Action ▶ Seed—antidiabetic, antidyenteric, emetic.

Mannogalactan from seeds reduces cholesterol and triglycerides (one-tenth and one-fifth when compared to clofibrate). Seeds are also applied to abscesses, and venereal sores (internally in gonorrhoea). Fruits—antidiabet-

ic; antidysenteric, expectorant. (Pulp is used as a substitute for ipecacuanha.)

The Ayurvedic Pharmacopoeia of India recommends the seed in dysuria, polyuria, urolithiasis, also in epilepsy.

The seeds, leaves and trunk bark gave diabolin (major alkaloid) and acetyldiabolin. Seeds also gave brucine, strychnine, novacine, icajine, oleanolic acid and its glycoside. Leaves and bark gave isomotioli, stigmaterol, campesterol and sitosterol. Diabolin exhibits hypotensive activity.

A decoction of seeds is given to treat stammering.

The seeds resemble those of Nux-vomica but are non-poisonous. The ripe seeds are used for clearing muddy water.

Dosage ▶ Seed—3–6 g. (*API*, Vol. IV.)

Strychnos rheedei C.B.Clarke.

Synonym ▶ *S. cinnamomifolia* Thw. *S. wallichiana* Steud.

Family ▶ *Loganiaceae; Strychnaceae*.

Habitat ▶ Western Ghats, from South Kanara to Trivandrum, up to 900 m and in Andhra Pradesh.

Siddha/Tamil ▶ Valli Kanjiram.

Action ▶ Roots—antirheumatic, anti-inflammatory, febrifuge. Used for neurological affections, elephantiasis and muscular pains.

Indole type alkaloids have been reported from the plant.

Styrax benzoin Dry.**Family** ▶ *Styracaceae*.**Habitat** ▶ Native to South-East Asia and East Indies.**English** ▶ True Gum Benzoin, Sumatra Benzoin or Gum Benjamin.**Unani** ▶ Lobaan.**Siddha/Tamil** ▶ Saambiraani.**Action** ▶ Gum—antiseptic, astringent, anti-inflammatory, expectorant (used for cough and respiratory tract catarrh). Used as genitourinary antiseptic, as a mouthwash in stomatitis, topically on wound and ulcers, as an inhalation in colds, coughs and bronchitis. Lipophilic fraction stimulates phagocytosis.

The gum contains mainly cinnamic, benzoic and sumaresinolic acid esters, benzaldehyde and vanillin.

Styrax officinale Linn.**Family** ▶ *Styracaceae*.**Habitat** ▶ A native to Asia minor and Syria.**English** ▶ The True Storax tree.**Ayurvedic** ▶ Silhaka, Silaarasa, Turushka, Kapitaila, Yavandeshaja.**Folk** ▶ Silaajit, Usturak.**Action** ▶ Balsam is used for cough and respiratory tract catarrh. Turushka was obtained from *Styrax officinale*. Due to scarcity, it was replaced by the exudation of *Liquidamber orientalis* Mill. Balsam obtained from *Altingia excelsa* Noronha is

used as a substitute for Silhaka and is known as Silaarasa (occurs in Assam and Arunachal Pradesh).

Dosage ▶ Balsam—500 mg to 1.0 g. (CCRAS.)**Sutherlandia frutescens** R.Br.**Family** ▶ *Papilionaceae*; *Fabaceae*.**Habitat** ▶ Native to South Africa; cultivated in Indian gardens.**English** ▶ Bladdersenna, Cancerwort, Cape Baloon Pea.**Action** ▶ Leaves—infusion or decoction given in stomach and intestinal disorders and hepatic affections. Much milder in action than true Senna.**Swertia affinis** C. B. Clarke.**Synonym** ▶ *S. angustifolia* Buch.-Ham ex. D. Don var. *pulchella* Burkill.**Family** ▶ *Gentianaceae*.**Habitat** ▶ Sub-tropical Himalaya from Himachal Pradesh to Bhutan, the Khasi and Lushai Hills, Manipur at 300–1,800 m. Bihar and Peninsular India up to 1,800 m.**Ayurvedic** ▶ Kiraatatiktka (related species).**Action** ▶ Febrifuge and bitter tonic.**Swertia angustifolia**
Buch.-Ham ex D. Don.**Family** ▶ *Gentianaceae*.

Habitat ▶ Sub-tropical Himalaya from Kashmir to Bhutan.

Ayurvedic ▶ Kiraata (sweet var.).

Folk ▶ Pahaari Kiretta, Mithaa (sweet) Kiryaat.

Action ▶ Used as a substitute for *S. chirayita*. (Inferior in bitter tonic properties.)

Aerial parts gave ursolic acid, xanthenes and beta-sitosterol. Several tetra- and penta-oxygenated xanthenes have been isolated from the plant.

Swertia chirayita

(Roxb. ex Flem.) Karst.

Synonym ▶ *S. chirata* (Wall.) C. B. Clarke.

S. tongluensis Burkill.

Gentiana chirayita Roxb. ex Flem.

G. chirata Wall.

Ophelia chirata Griseb.

Family ▶ Gentianaceae.

Habitat ▶ Temperate Himalayas from Kashmir to Bhutan and in Khasi Hills.

English ▶ Chiretta.

Ayurvedic ▶ Kiraata, Kairaata, Kiraataka, Kandatiktta, Kiraatatiktta, Kiraatatiktaka, Katutiktta, Trinimba, Bhuunimba, Aranyatikta, Raamasenaka. Bhuunimba (also equated with *Andrographis paniculata*).

Unani ▶ Chiraitaa.

Siddha ▶ Nilavembu.

Action ▶ Blood purifier and bitter tonic (*The Ayurvedic Pharmacopoeia of India*); used in skin

diseases. Other properties: anti-inflammatory (experimentally, the benzene extract was comparable with phenylbutazone and betamethasone in induced arthritis); hypoglycaemic (xanthone, swerchirin, lowers blood sugar), astringent, stomachic (in dyspepsia and diarrhoea); antimalarial (before the discovery of Peruvian bark), anthelmintic; antiasthmatic, bechic; and as a liver tonic (several active principles are hepatoprotective).

The herb contains oxygenated xanthone derivatives, including decussatin, mangiferin, swerchirin, swertianin, isobellidifolin; iridoids including chiratin, alkaloids including gentianine, gentiocrucine, enicoflavine and glycosyl flavones.

Antitubercular activity has been claimed in xanthenes. (*Natural Medicines Comprehensive Database*, 2007.)

Green chiretta is equated with *Andrographis paniculata* Nees, *Acanthaceae*.

Dosage ▶ Whole plant—1–3 g powder; 20–30 g for decoction. (*API*, Vol. I.)

Swertia ciliata

(D. Don) Burt.

Synonym ▶ *S. purpurascens* Wall. ex C. B. Clarke.

Family ▶ *Gentianaceae*.

Habitat ▶ From Konkan to Kerala at 1,500–2,000 m.

Ayurvedic ▶ Shailaja, Kiraatatiktta (related species).

Action ▶ A substitute for *S. chirayita*. The whole plant contains a number of tetraoxygenated and penta-oxygenated xanthenes.

Swertia densifolia (Griseb.) Kashyapa.

Synonym ▶ *S. decussata* Nimmo ex Grah.
Ophelia multiflora Dalz.

Family ▶ *Gentianaceae*.

Habitat ▶ From Konkan to Kerala at 1,500–2,000 m.

Ayurvedic ▶ Shailaja, Kiraatatikta (related species).

Action ▶ A substitute for *S. chirayita* and *Gentiana lutea* L.

The leaves and flowers contain xanthone—swartinin, triterpenes, oleanolic acid and beta-sitosterol. Decussatin is also present in the flowers and root.

Swertia lawii Burkil.

Synonym ▶ *S. corymbosa* var. *lawii* C. B. Clarke.

Family ▶ *Gentianaceae*.

Habitat ▶ Western Ghats from Maharashtra to South Kanara at 1,200 m.

Ayurvedic ▶ Kiraatatikta (related species).

Action ▶ Used as a substitute for *Swertia chirayita*.

Whole plant gave a number of xanthenes. Erythrocentaurin has also been reported from the plant.

Swertia paniculata Wall.

Synonym ▶ *Ophelia paniculata* (Wall.) D. Don
O. wallichii G. Don

Family ▶ *Gentianaceae*.

Habitat ▶ The Himalaya from Kashmir to Bhutan and in Lushai Hills in Mizoram at 1,500–2,400 m.

Action ▶ Used as a substitute for *Swertia chirayita*.

The root gave xanthenes (including swerchirin and bellidifolin); flavone-C-glycosides—swertisin and homoorientin. The plant gave polyoxygenated xanthenes and xanthone-O-glucosides; also a pentacyclic triterpenehederagenin. Aerial parts, in addition to xanthenes, contain ursolic acid.

Swietenia mahagoni Jacq.

Family ▶ *Symphoremataceae*.

Habitat ▶ Native to Central America; cultivated in South India.

English ▶ West Indian Mahogany.

Siddha/Tamil ▶ Ciminukku.

Folk ▶ Mahaagani.

Action ▶ Bark—astringent and antipyretic. Used as a substitute for cinchona bark is the West Indies. The bark contains 15% tannin, the wood 6%.

The seeds have been reported to contain a bitter substance; mahoganin, 7-deactyl-7-oxogedunin, cyclomahoganol and 6-hydroxymethyl angolensate are also present.

Tetranortriterpenoids have been isolated from cotyledons and seeds. The ether extract of the leaves inhibits platelet activity factor (PAF)-induced platelet aggregation.

Symphorema involucreatum Roxb.

Family ► *Symphoremataceae*.

Habitat ► Indo-Malaysian region.

Found in Deccan Peninsula, ascending to 1,200 m, and in Bihar, Orissa, Madhya Pradesh and Nagaland.

Folk ► Surudu, Konatekkali, Gubbadaara (Telugu).

Action ► Quercetin, isolated from fresh water flowers, exhibited anti-inflammatory activity experimentally, comparable to that of phenylbutazone.

Symphytum officinale Linn.

Family ► *Boraginaceae*.

Habitat ► Europe and from the Mediterranean to Caucasian region. Russian Comfrey or Blue Comfrey has been introduced in Simla; Prickly Camfrey is cultivated in Western India.

English ► Comfrey, Knitbone.

Folk ► Sankuutan (Maharashtra).

Action ► Vulnerary (*The British Herbal Pharmacopoeia*), astringent, demulcent, haemostatic, tissue-restorative (repairs broken bones

and lacerated flesh, promotes formation of a callus).

Key application ► Externally for fractures and sprains, to promote bone growth and formation of callus. (*German Commission E.*)

Allantoin, a cell proliferant, helps repair damaged tissues. Anti-inflammatory action is due to rosmarinic acid and other phenolic acids. Used for stomach ulcers, irritable bowel syndrome, colitis, hiatus hernia; pleurisy, bronchitis (contraindicated in oedematous conditions of the lung); and for the treatment of fractures, sickets, varicose ulcers. Experiments, during the 1960s, reveal that pyrrolizidine alkaloids are toxic to liver (dispute still unresolved); it is still not clear if these are hepatotoxic in the context of the whole plant. The aerial parts are considered safe.

Russian Comfrey or Blue Comfrey has been equated with *Symphytum peregrinum* Ledeb. (introduced into India in Simla).

The Plant is a good source of allantoin, a drug used in the treatment of gastric ulcers, disorders of liver and cancer. Tincture of the fresh herb is reported to be used for asthma, bronchitis and congestive conditions of the lungs.

Symplocos paniculata (Thunb.) Miq.

Synonym ► *S. crataegoides* Buch.-Ham. ex Don.

S. chinensis (Lour.) Druce.

Prunus paniculatus Thunb.

Family ► *Symplocaceae*.

Habitat ▶ The Himalayas from Kashmir to Arunachal Pradesh and Assam; Khasi Hills at 1,000–2,500 m.

English ▶ Sapphire Berry.

Ayurvedic ▶ Lodhra-Pattikaa.

Unani ▶ Lodh Pathaani.

Action ▶ Leaf—spasmolytic, antiviral, antiprotozoal, anthelmintic. Bark—used as a tonic for preventing abortion. Other uses same as of *S. racemosa*.

The water-soluble fraction from the bark has been reported to exhibit anti-oxycytocic activity. Ethanolic extract of the leaves showed activity against *Entamoeba histolytica* strain STA, *Ascaridia galli* and *Ranikhet-disease virus*. It also affected blood pressure in dogs and cats, and showed activity on the ileum of guinea-pigs. The extract of stem also affected the blood pressure.

The leaf and stem are CVS active.

Symplocos racemosa Roxb.

Synonym ▶ *S. beddomei* C. B. Clarke
S. candolleana Brand.

Family ▶ Symplocaceae.

Habitat ▶ Throughout North and eastern India, extending southwards to Peninsular India.

English ▶ Lodh tree, Sapphire Berry.

Ayurvedic ▶ Lodhra, Rodhra, Shaavara., Sthulavalkal, Trita, Pattikaa Lodhra, Shaabara Lodhra.

Unani ▶ Lodh Pathaani.

Siddha/Tamil ▶ Vellilethi, Velli-lothram.

Action ▶ Bark—used as specific remedy for uterine complaints, vaginal diseases and menstrual disorders; menorrhagia, leucorrhoea (*The Ayurvedic Pharmacopoeia of India*); also used in diarrhoea, dysentery, vaginal ulcers, inflammatory affections and liver disorders.

The bark gave colloturine, harman (loturine) and loturidine. Stem bark gave proanthocyanidin-3-monoglucosides of 7-O-methyl- and 4'-O-methyl-leucopelargonidin. Betulinic, oleanolic, acetyl oleanolic and ellagic acids are reported from the plant.

Glycosides, isolated from the ethanolic extract of the stem bark, are highly astringent and are reported to be responsible for the medicinal properties of the bark.

The bark extracts have been reported to reduce the frequency and intensity of the contractions *in vitro* of both pregnant and non-pregnant uteri of animals. A fraction from the bark, besides showing action on uteri, was spasmogenic on various parts of the gastrointestinal tract and could be antagonized by atropine.

The bark extracts were found to inhibit the growth of *E. coli*, *Micrococcus pyogenes* var. *aureus*, and enteric and dysenteric groups of organisms.

Dosage ▶ Stem bark—3–5 g powder; 20–30 g for decoction. (*API*, Vol. I.)

S. laurina Wall., synonym *S. spicata* Roxb. (North and East India, Western and Eastern Ghats); *S. ramosissima* Wall. (the temperate Himalayas from Garhwal to Bhutan); *S. sumuntia* Buch.-Ham. (Nepal to Bhutan) are also equated with Lodhra.

The powdered bark is used in folk medicine for biliousness, haemorrhages, diarrhoea, dysentery and genitourinary diseases.

Symplocos theaefolia Buch-Ham. ex D. Don (the Eastern Himalayas from Nepal to Bhutan and in the Khasi Hills at altitudes between 1,200 and 2,500 m) is known as Kharanl in Nepal and Dieng-pei or Dieng-twe-pe in khasi.

The ethanolic extract of leaves showed hypoglycaemic activity in rats and anticancer activity against Friend-virus-leukaemia (solid) in mice. The extract of the leaves and of stems showed activity against human epidermoid carcinoma of the nasopharynx in tissue-culture.

The Wealth of India equated *S. laurina* with Lodh Bholica (Bengal) and *S. sumuntia* with Pathaani Lodh.

The wood of *Symplocos phyllocalyx* C. B. Clarke is known as Chandan and Laal-chandan. It should not be confused with *Santalum album* or *Pterocarpus santalinus*.

S

Syringa vulgaris Linn.

Family ▶ *Oleaceae*.

Habitat ▶ Cultivated in gardens in the hills.

English ▶ Common Lilac.

Action ▶ Bark, leaves and capsules—used as antipyretic, especially in chronic malaria, and as vermifuge. Leaf extract—antipyretic.

The leaves, flowers and bark contain the glucoside, syringin and syringopicroin. Syringin is also present in the

roots and fruits; mannitol has been reported in leaves, bark and fruits. The leaves contain 131.6 mg/100 g of vitamin C. Ursolic acid has also been reported in the plant.

Syzygium aromaticum

(Linn.) Merr. & Perry.

Synonym ▶ *Eugenia aromatica* Kuntze.

Eugenia caryophyllata Thunb.

Caryophyllus aromaticus Linn.

Family ▶ *Myrtaceae*.

Habitat ▶ Cultivated in Tamil Nadu and Kerala.

English ▶ Clove.

Ayurvedic ▶ Lavanga, Devakusum, Devapushpa, Shrisangya, Shriprasahana.

Unani ▶ Qaranful, Laung.

Siddha/Tamil ▶ Kiraambu, Lavangam.

Action ▶ Carminative, anti-inflammatory, antibacterial. Flower buds—antiemetic, stimulant, carminative. Used in dyspepsia, gastric irritation. Oil—employed as a local analgesic for hypersensitive dentures and carious cavities; internally as a carminative and antispasmodic.

Key application ▶ In inflammatory changes of oral and pharyngeal mucosa; in dentistry; for topical anesthesia. (*German Commission E*.)

Eugenin, triterpene acids, catecholic acid and steroid glucosides afford anti-inflammatory and antiseptic proper-

ties to the buds. Eugenol, a major component of the oil, is antibacterial. Acetone extract of clove, eugenol and acetyleneugenol possess cholagogue activity. The eugenol and acetyleneugenol components of the clove oil inhibit arachidonate-, adrenalin- and collagen-induced platelet aggregation.

Clove terpenes show significant activity as inducers of detoxifying enzyme, glutathione-S-transferase (GST) in mouse liver and intestine and bring about carcinogen detoxification.

Whole cloves might have chemoprotective activity against liver and bone marrow toxicity. (*The Review of Natural Products by Facts and Comparisons*, 1999.)

Dosage ▶ Dried flower-bud—0.5–2.0 g powder. (*API*, Vol. I.)

Syzygium cerasoideum
(Roxb.) Chatterjee & Kanjilal f.

Synonym ▶ *S. nervosum* DC.
S. operculatum Niedenz.
Eugenia operculata Roxb.

Family ▶ *Myrtaceae*.

Habitat ▶ Uttar Pradesh, Bihar, Orissa and Assam up to 600 m and in the Western Ghats up to 900 m.

Ayurvedic ▶ Bhumi Jambu.

Folk ▶ Rai Jaamun, Dugdugiaa; Topaakudaa (Bihar), Peeta-jaam (Orissa).

Action ▶ Fruit—antirheumatic. Aerial part—hypoglycaemic.

Root—rubefacient. Bark—bitter, astringent; given in dysentery, biliousness and bronchitis. A concentrate of the root infusion is applied and rubbed over painful joints. Aerial parts exhibit hypoglycaemic activity.

Syzygium cuminii (Linn.) Skeels.

Synonym ▶ *S. jambolanum* (Lam.) DC.
Eugenia jambolana Lam.

Family ▶ *Myrtaceae*.

Habitat ▶ Cultivated throughout India up to 1,800 m.

English ▶ Java Plum, Jambolan, Black Plum.

Ayurvedic ▶ Jambu, Mahaaphalaa, Phalendraa, Surabhipatra. (Fruit—black.)

Unani ▶ Jaamun

Siddha/Tamil ▶ Naaval.

Action ▶ Fruit—stomachic, carminative, diuretic. Bark and seed—antidiarrhoeal. Seed—hypoglycaemic. Leaf—antibacterial, antidyenteric.

Key application ▶ Bark—in non-specific acute diarrhoea and in topical therapy for mild inflammation of the oral-pharyngeal mucosa; externally in mild, superficial inflammation of the skin. (*German Commission E*.) The seed has been included among unapproved herbs by *German Commission E*, as the blood sugar-lowering effect could not be established by several

researchers. Claimed applications mentioned in *German Commission E* monograph: in diabetes, also in combination preparations for atonic and spastic constipation, diseases of the pancreas, gastric and pancreatic complaints.

The Ayurvedic Pharmacopoeia of India recommends the bark in acute diarrhoea and haemorrhagic diseases; the seed in hyperglycaemia and polyuria.

The aqueous alcoholic extract of the bark contains bergenin, gallic acid and ethyl gallate.

The fruit contains anthocyanins and yielded citric, malic and gallic acids. Gallic acid and tannins account for astringency of the fruit. Malic acid is the major acid (0.59%) of the weight of fruit; a small quantity of oxalic acid is reported to be present. Glucose and fructose are principal sugars in the ripe fruit; sucrose was not detected.

The seeds contain tannin (about 19%), ellagic acid, gallic acid (1–2%), beta-sitosterol, 0.05% essential oil; myricyl alcohol is present in the unsaponifiable matter.

The stem bark yielded friedelan-3-alpha-ol, kaempferol, quercetin, beta-sitosterol and its glycoside, kaempferol-3-O-glucoside, gallic acid, friedelin and betulinic acid. It contained eugenin and epi-friedelanol. 10–12% tannins were reported.

The leaves contain aliphatic alcohols, sitosterols, betulinic acid and crategolic (maslinic) acid.

The flowers contain triterpenic acids—oleanolic acid and crategolic acid. The oleanolic acid is a strong protector against adriamycin-induced

lipid peroxidation in liver and heart microsomes.

Phenols, including methylxanthoxylin and 2, 6-dihydroxy-4-methoxyacetophene have been isolated from the plant (also from the seed).

Seeds in a dose of 10 mg/kg *p.o.* on normal and alloxanized rabbits exhibited hypoglycaemic activity up to 23 and 20% respectively. The chloroform fraction of seed extract exhibited potent anti-inflammatory action against both exudative and proliferative and chronic phases of inflammation, besides exhibiting significant anti-arthritis, antipyretic and analgesic activities. Water extract exhibited antibacterial property against *S. boydi* and *S. dysenteriae* in cases of dysentery and diarrhoea.

The bark extract is reported to have an effect on glycogenolysis and glycogen storage in animals.

Dosage ▶ Stem bark—10–20 g for decoction; dried seed—3–6 g powder. (*API*, Vol. II.)

Syzygium hemisphericum (Wt.) Alston

Synonym ▶ *Eugenia hemispherica* Wt.

Jambosa hemispherica (Wt.) Walp.

Family ▶ *Myrtaceae*.

Habitat ▶ South India, particularly in the Nilgiri, Palni and Annamalai hills and Western Ghats.

Siddha/Tamil ▶ Vellai Naval.

Action ▶ Bark—antibilious; also used for syphilitic affections.

Syzygium jambos (Linn.) Alston.

Synonym ▶ *Eugenia jambos*
Linn. *Jambosa vulgaris* DC.

Family ▶ *Myrtaceae*.

Habitat ▶ Cultivated in many parts of India.

English ▶ Rose Apple.

Ayurvedic ▶ Raaj-Jambu. (Fruits—pale yellow or pinkish white).

Siddha/Tamil ▶ Peru Navel.

Folk ▶ Gulaabjaamun.

Action ▶ Fruit—used in liver complaints. Bark—astrigent, antidiarrhoeal, antidysenteric. Leaves—astrigent, anti-inflammatory.

The juice of fresh fruit contains alanine, aspartic acid, cystine or cysteine, glutamine, threonine and tyrosine. The essential oil, obtained from leaves, is a good source of *dl*-alpha-pinene (26–84%) and *l*-limonene (23–84%).

Ethyl acetate and methanolic extract of the leaves are very effective in curing pedal oedema and in acute and chronic swelling; also gave encouraging results in arthritis. Though all extracts (methanolic, hexane, dichloromethane and ethyl acetate) of the leaves exhibit anti-inflammatory activity, a 10% aqueous extract of the leaves is found significantly effective when compared to 80 mg/kg of phenylbutazone.

In Brazil, a decoction of dry leaves is given in diabetes.

Aerial parts exhibit diuretic activity.

Syzygium malaccense

(Linn.) Merrill & Perry.

Synonym ▶ *Eugenia malaccensis* Linn.

Family ▶ *Myrtaceae*.

Habitat ▶ Cultivated in Bengal and South India, chiefly in gardens.

English ▶ Malay Apple, Mountain Apple.

Action ▶ Leaves—dried and powdered, used against stomatitis. Bark—astrigent; used for making a mouthwash for thrush.

The extracts of seeds, fruits, leaves, stem and bark show varying degree of antibiotic activity against *Micrococcus pyogenes* var. *aureus*. An extract of fruits (without seeds) is moderately effective against *E. coli* and those of bark and leaves against *Shigella paradys*.

The extracts of the plant, excluding root, affect the rate and amplitude of respiration and also blood pressure.

Syzygium zeylanicum

(Linn.) DC.

Synonym ▶ *Eugenia zeylanica* (L.) Wight.

Family ▶ *Myrtaceae*.

Habitat ▶ Maharashtra, Mysore, Kerala, Orissa and Andaman Islands.

Siddha/Tamil ▶ Marungi.

Folk ▶ Bhedas (Maharashtra).

Action ▶ Leaves and roots—vermifuge. Plant—stimulant, antirheumatic. (Berries—white, the size of a pea; edible.)

Among other members of the genus, *S. arnottianum* (Wight) Walp. and *S. caryophyllatum* (Linn.) Alston are distributed in South India, particularly in

Western Ghats. The fruits are edible. Stem bark of all the species contain tannin, that of *S. arnottianum* up to 16%.