CBCS PG: Botany Elective

Semester-II: Plant Resources-II

(Allotted Topic)

Plants in Allopathy

(plant parts and active principle)

Allopathic Medicine

Allopathic or “Western” medicine is the medical practice aimed at using drugs and surgery to combat symptoms of disease and disorder, and to provide temporary relief from pain, inflammation, nerve disorder and cell disorder.

Allopathic Medicine is based on the propagated fear of death from infectious diseases and a complete lack of nutrition education.

History of Allopathic Medicine

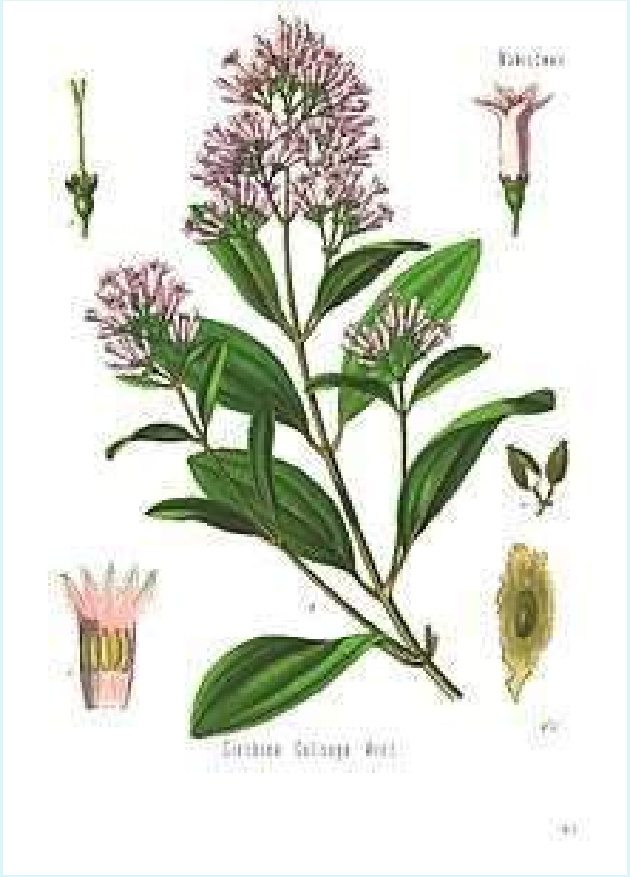
The term allopathic medicine was coined in the 1800's to differentiate 2 types of medicine.

Homeopathy was on one side and was based on the theory that "like cures like." The thought is that very small doses of a substance that cause the symptoms of a disease could be used to alleviate that disease.

In contrast, allopathic medicine was defined as the practice of using opposites; using treatments that have the opposite effects of the symptoms of a condition.

Quinine is a medication used to treat malaria. This includes the treatment of malaria due to *Plasmodium falciparum*.

Quinine was first isolated in 1820 from the bark of a cinchona tree. Bark extracts have been used to treat malaria since at least 1632.



- **In the 19th century, compounds such as quinine, strychnine, morphine, and ephedrine were isolated and studied.**

- **Later (mostly in the twentieth century) many of the compounds were synthesized and some became available.**

List of Drugs from Plant

Drug/Chemical	Action	Plant Source
Acetyldigoxin	Cardiotonic	Digitalis lanata (Grecian foxglove, woolly foxglove)
Adoniside	Cardiotonic	Adonis vernalis (pheasant's eye, red chamomile)
Aescin	Antiinflammatory	Aesculus hippocastanum (horse chestnut)
Aesculetin	Antidysentery	Frazinus rhychophylla
Agrimophol	Anthelmintic	Agrimonia supatoria
Ajmalicine	Treatment for circulatory disorders	Rauvolfia sepentina
Allantoin	Vulnerary	Several plants
Allyl isothiocyanate	Rubefacient	Brassica nigra (black mustard)

Anabesine	Skeletal muscle relaxant	Anabasis sphylla
Andrographolide	Treatment for baccillary dysentery	Andrographis paniculata
Anisodamine	Anticholinergic	Anisodus tanguticus
Anisodine	Anticholinergic	Anisodus tanguticus
Arecoline	Anthelmintic	Areca catechu (betel nut palm)
Asiaticoside	Vulnerary	Centella asiatica (gotu cola)
Atropine	Anticholinergic	Atropa belladonna (deadly nightshade)
Benzyl benzoate	Scabicide	Several plants
Berberine	Treatment for bacillary dysentery	Berberis vulgaris (common barberry)
Bergenin	Antitussive	Ardisia japonica (marlberry)

Bromelain	Antiinflammatory, proteolytic	Ananas comosus (pineapple)
Caffeine	CNS stimulant	Camellia sinensis (tea, also coffee, cocoa and other plants)
Camphor	Rubefacient	Cinnamomum camphora (camphor tree)
Camptothecin	Anticancerous	Camptotheca acuminata
(+)-Catechin	Hemostatic	Potentilla fragarioides
Chymopapain	Proteolytic, mucolytic	Carica papaya (papaya)
Cissampeline	Skeletal muscle relaxant	Cissampelos pareira (velvet leaf)
Cocaine	Local anaesthetic	Erythroxylum coca (coca plant)
Codeine	Analgesic, antitussive	Papaver somniferum (poppy)
Colchiceine amide	Antitumor agent	Colchicum autumnale (autumn crocus)

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Colchiceine amide	Antitumor agent	Colchicum autumnale (autumn crocus)
Colchicine	Antitumor, antigout	Colchicum autumnale (autumn crocus)
Convallatoxin	Cardiotonic	Convallaria majalis (lily-of-the-valley)
Curcumin	Choleretic	Curcuma longa (turmeric)
Cynarin	Choleretic	Cynara scolymus (artichoke)
Danthron	Laxative	Cassia species
Demecolcine	Antitumor agent	Colchicum autumnale (autumn crocus)
Deserpidine	Antihypertensive, tranquilizer	Rauvolfia canescens
Deslanoside	Cardiotonic	Digitalis lanata (Grecian foxglove, woolly foxglove)

Ephedrine	Sympathomimetic, antihistamine	Ephedra sinica (ephedra, ma huang)
Etoposide	Antitumor agent	Podophyllum peltatum (mayapple)
Galanthamine	Cholinesterase inhibitor	Lycoris squamigera (magic lily, resurrection lily, naked lady)
Gitalin	Cardiotonic	Digitalis purpurea (purple or common foxglove)
Glaucarubin	Amoebicide	Simarouba glauca (paradise tree)
Glaucine	Antitussive	Glaucium flavum (yellow hornpoppy, horned poppy, sea poppy)
Glasiovine	Antidepressant	Octea glaziovii
Glycyrrhizin	Sweetener, treatment for Addison's disease	Glycyrrhiza glabra (licorice)

Alkaloids

- **A number of alkaloids from Solanaceous plants are used as analgesics and anaesthetics**

- **Scopolamine(hyoscine): Datura, *Dubosia***
- **Atropine : *Atropa belladonna***

- **Scopolamine** reduces the secretions of certain organs in the body, such as the stomach and intestines
- **Atropine** is a medication used to treat certain types of nerve agent and pesticide poisonings, some types of slow heart rate, and to decrease saliva production

Dried leaves and flowers

Datura stramonium
Solanaceae

- **Belladonna has been used since the times of the Greeks. It was also used in the Middle Ages in Europe to enhance the appearance of women by dilating pupils.**

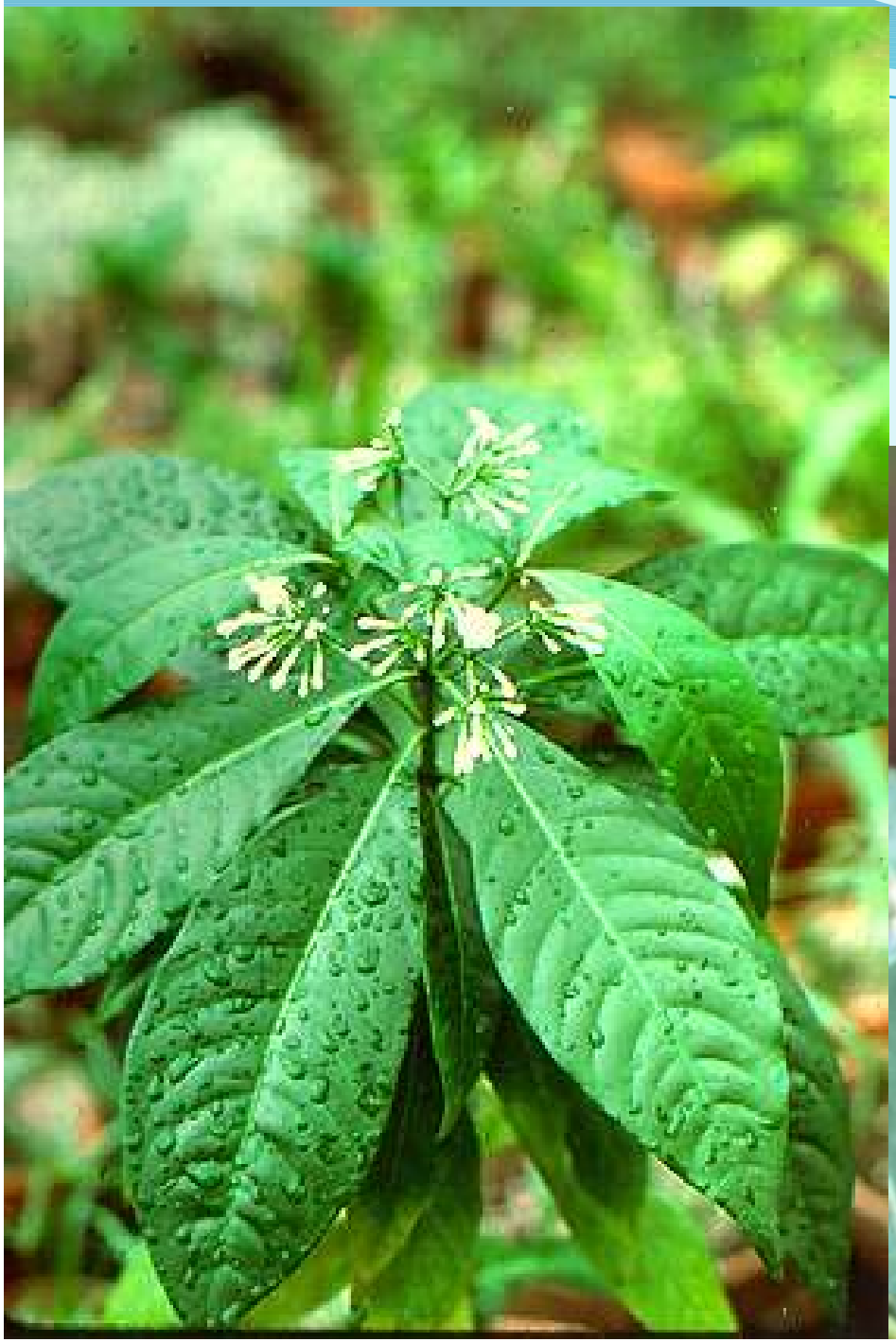
- **Today, these alkaloids are used as antidotes for poisoning, to treat cardiac problems, in antidiarrhoea preparations, and to dilate pupils during eye examinations.**

Atropa belladonna
Solanaceae

Rauvolfia Alkaloids

- A number of plants of this group were used medicinally in India several centuries BC.
- *Rauvolfia serpentina* (Apocynaceae)- contains alkaloids that are potent hypotensive agents.

- One of the main alkaloids, reserpine, is used to treat hypertension and certain types of mental illness. Relatively large doses are used to treat schizophrenic patients.



Rauvolfia serpentina
(Apocynaceae)

Dried roots

Catharanthus alkaloids

- **Two complex alkaloids of *Catharanthus roseus* (Apocynaceae) are used to treat leukemia.**
- **Vinblastine and vincristine are antineoplastic, kill various types of cancerous cells.**

Dried leaves

Catharanthus roseus (Apocynaceae)
Sadabahar

Opium poppy, *Papaver somniferum* (Papaveraceae)

- The alkaloids found in opium poppy, *Papaver somniferum* (Papaveraceae), have long been used to alleviate pain.
- Opium is isolated by lightly slashing the immature fruit capsules. The latex oozes out and hardens after a day or so.
- **Morphine** is one of the principal alkaloids of opium. These alkaloids are very addictive, but are potent pain killers (analgesics).
- **Codeine**, another morphine alkaloid, is a potent antitussive agent, that is, it inhibits coughing.

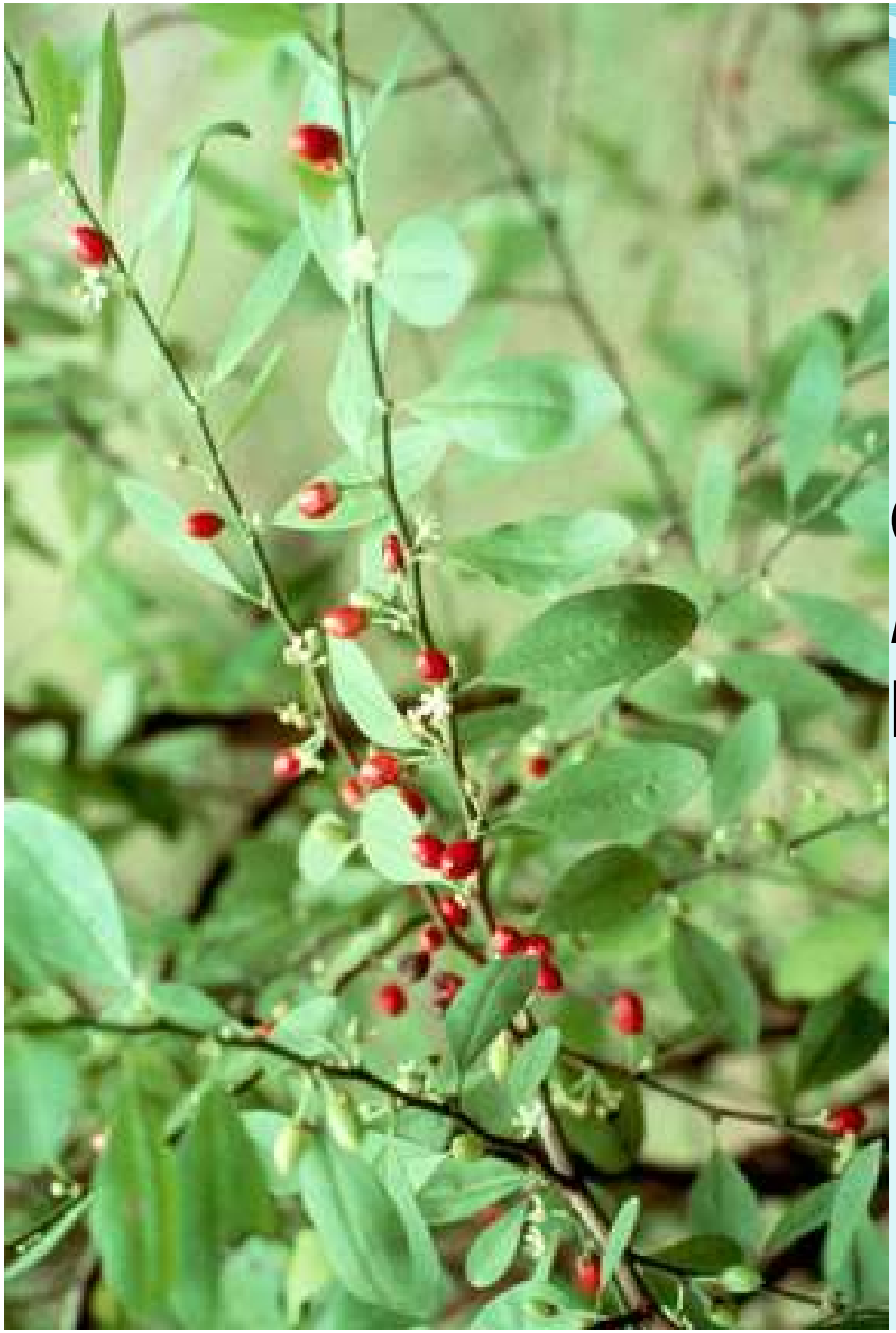


Poppy flower and capsule

Coca and cocaine

- **Coca leaves (*Erythroxylum coca*, Erythroxylaceae) have long been used as a stimulant. The Indians chewed the leaves mixed with lime to free the alkaloids. The alkaloids reduced feelings of hunger and pain.**

- **Later when the alkaloids were isolated, it was discovered that they had local anesthetic properties. Cocaine has been used for surgery (especially dental surgery).**



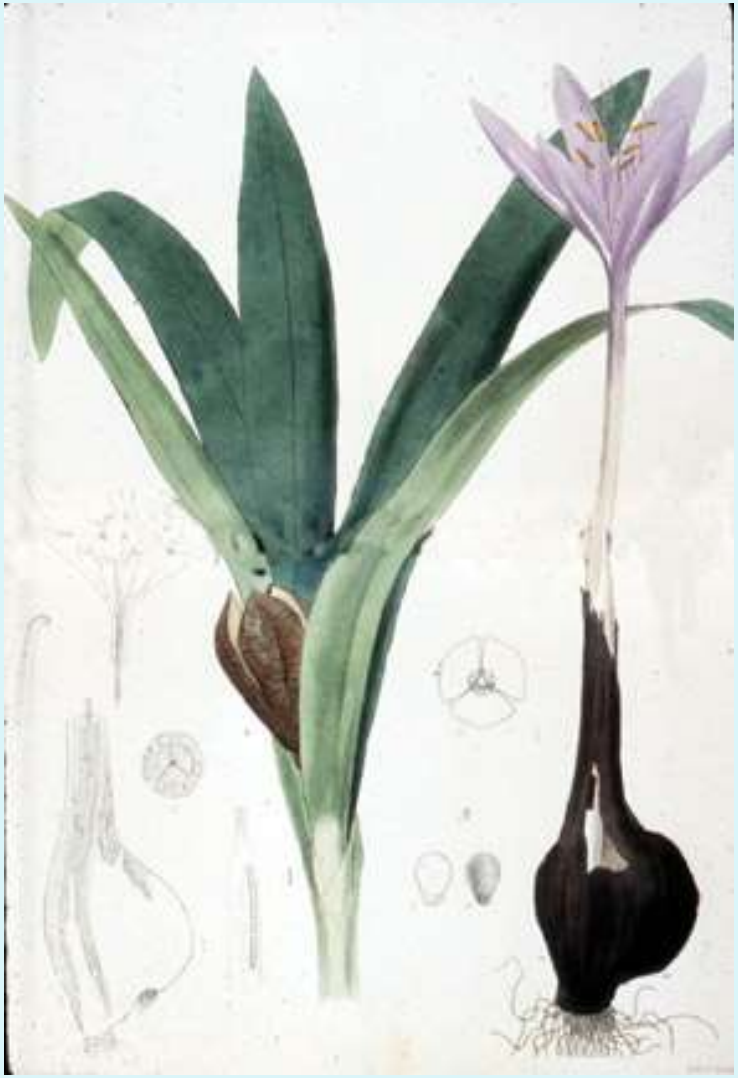
Coca
Erythroxylum coca
Erythroxylaceae

Colchicine

- **Colchicine, an alkaloid from *Colchicum autumnale* (Liliaceae), is used to treat gout.**

- **The compound is fairly specific for the disease, but is highly toxic and its use must be carefully monitored.**

Colchicum autumnale (Liliaceae)



- **Quinine is obtained from dried barks of stem and root of *Cinchona spp.***
- **It is antimalarial, effective against chloroquine resistant mosquito strains.**

- **Although there have been extensive searches for new plant-derived antimalarials, few have surfaced.**

- **One, artemisinin from *Artemisia annua*, has proved effective and is currently being used in southeast Asia.**

Quinine, *Cinchona officinalis*, Rubiaceae

Harvesting cinchona bark

Drying and storing cinchona bark

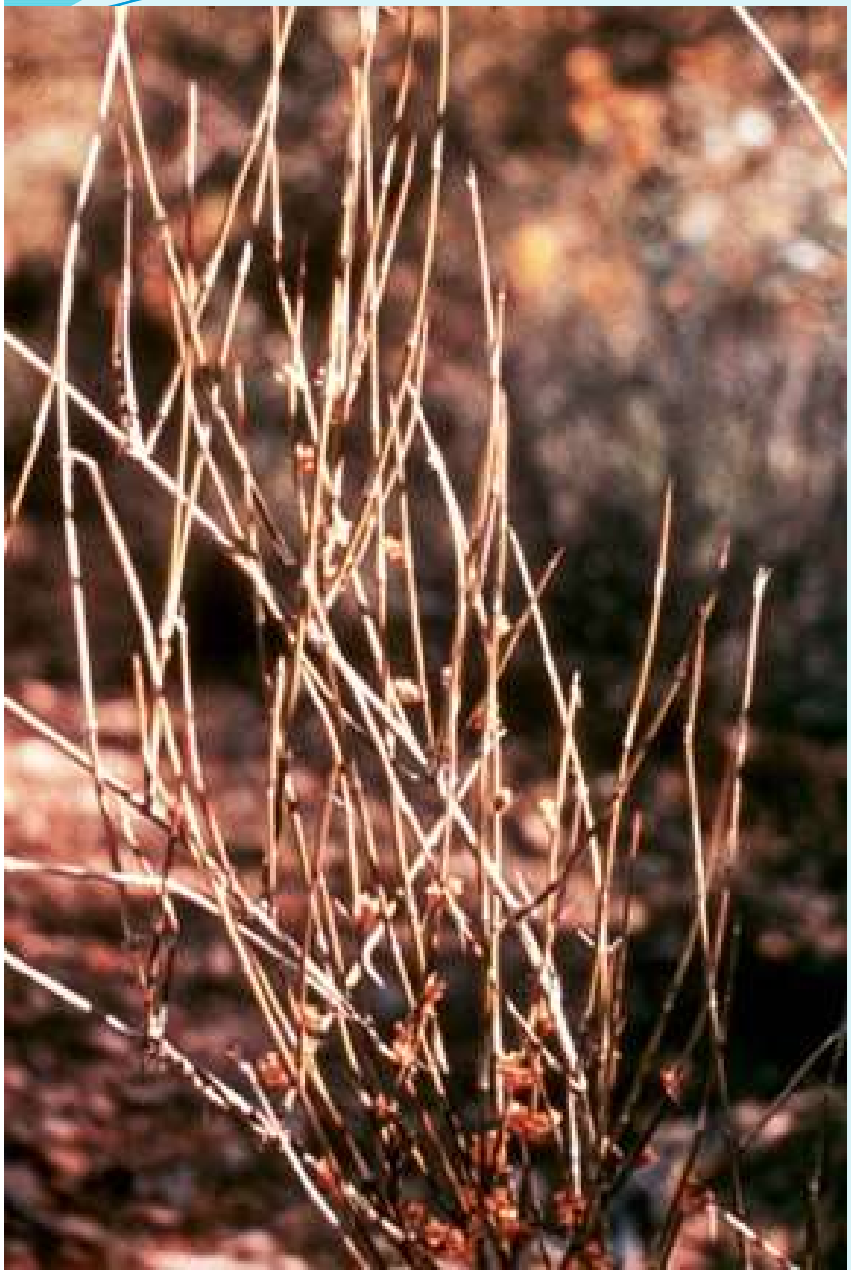
***Artemisia annua*, Asteraceae or Compositae**

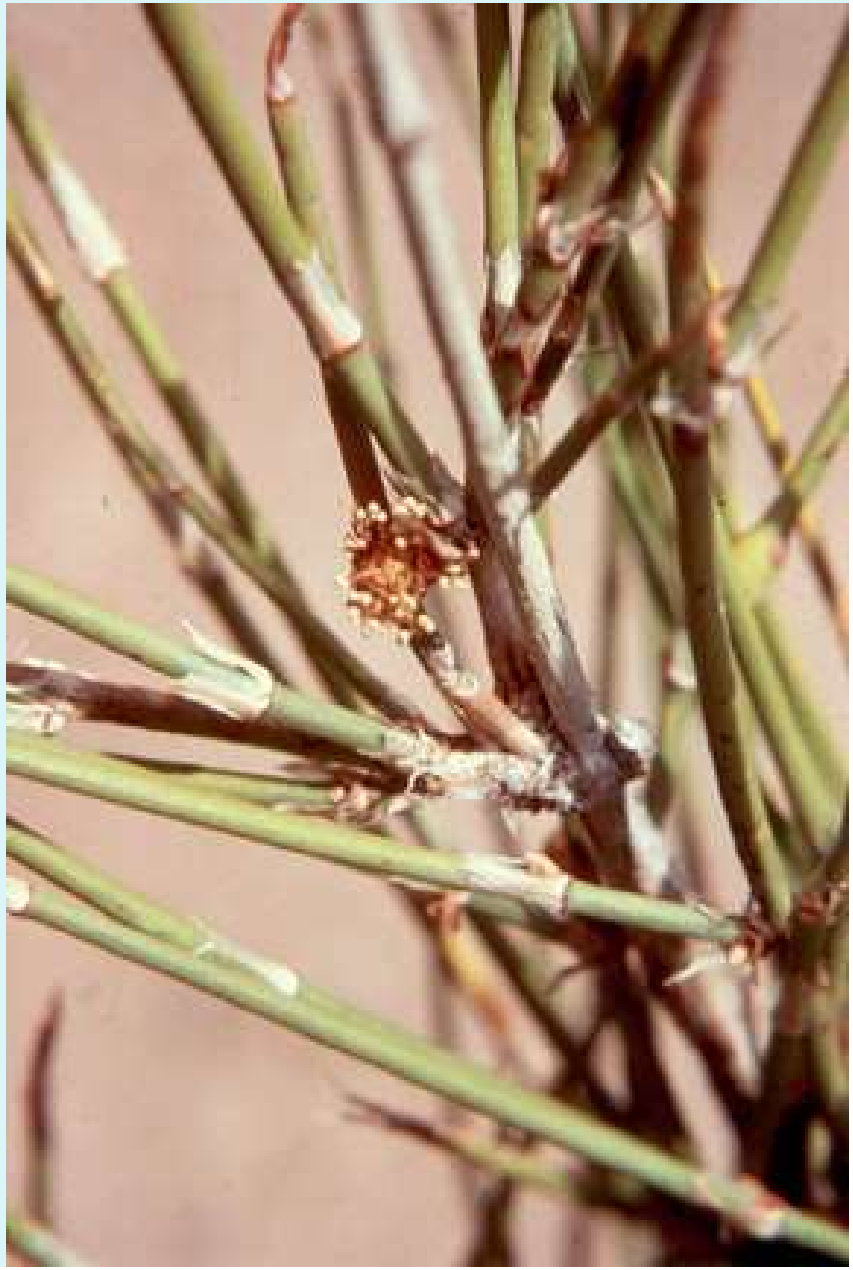
Ephedrine - *Ephedra* spp., Ephedraceae

- Infusions of *Ephedra* spp. (Ephedraceae, a gymnosperm) have been used for thousands of years in China. There it is often called "ma huang".

- Ephedrine and a series of related compounds are used today as decongestants and to treat low blood pressure.

Ephedra sp., Ephedraceae





Willows and aspirin

- **Extracts of willow bark (*Salix* spp., Salicaceae) and leaves alleviated pain.**
- **The compound that is responsible is called "salicin".**
- **This compound, acetylsalicylic acid, could be taken orally and was an effective analgesic, anti-inflamatory, and antipyretic drug and is probably the most widely used drug in the world today.**

Willow, *Salix nigra*, Salicaceae

Steroids from plants

- **Many types of animal hormones are steroids. Although the steroids from plants are similar, most do not have pronounced hormonal activity in animals and ordinarily must be chemically modified before use.**

- **The commonly used plant for steroids is *Dioscorea* spp. (Dioscoreaceae). The plants have large tuberous roots.**

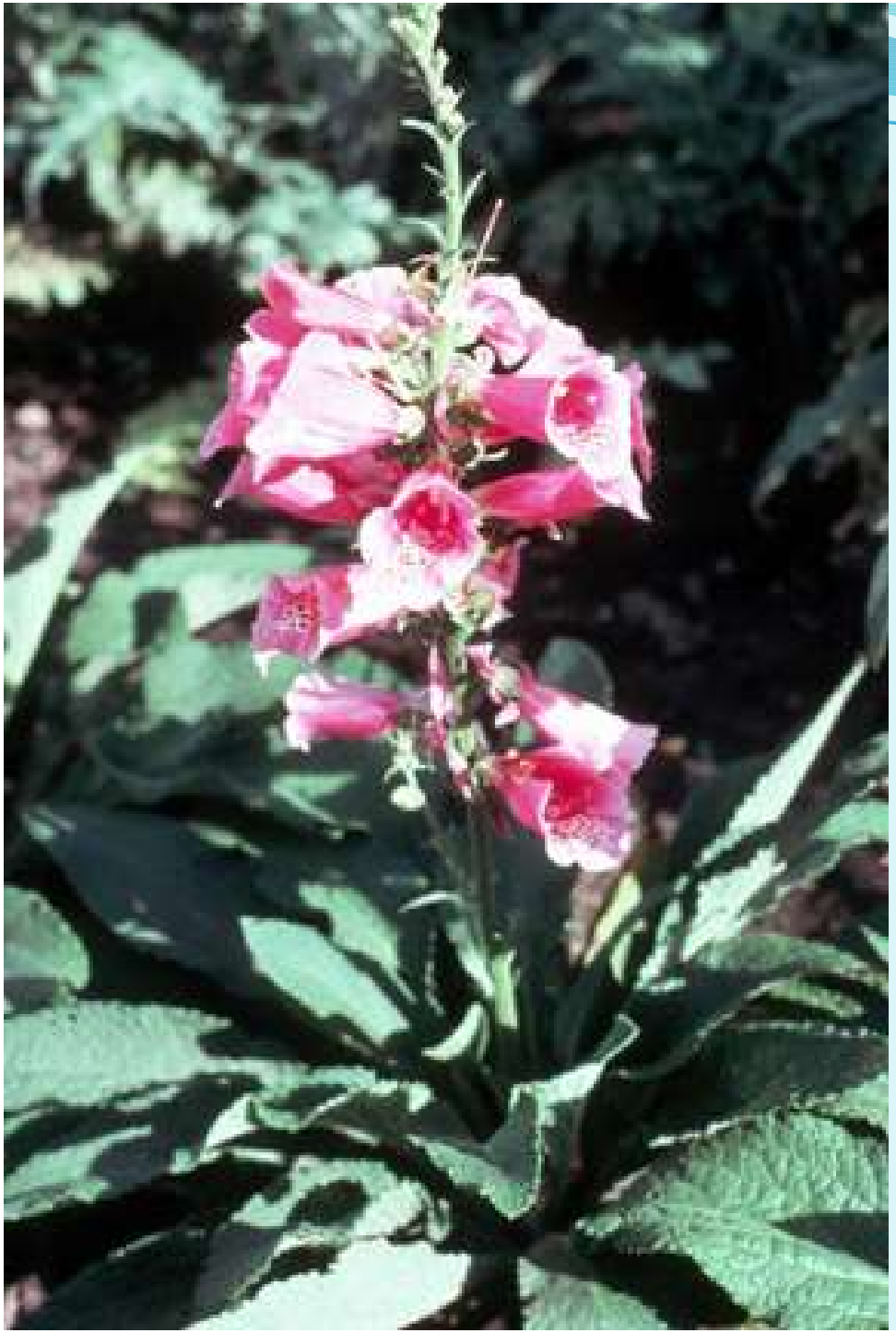
- **These steroids occur as complex glycosides (that is, they have sugars attached) that give them soap-like properties and are sometimes called saponins. These compounds are relatively common in plants.**

- **Starting material for cortisones, sex hormone; used in anti inflammatory and anti fertility medicines.**

Male and female *Dioscorea* plants

Cardiac glycosides

- **The use of plants to treat heart disease goes back thousands of years and is found in several cultures.**
- **One of the plants found in the folk medicine of Europe is *Digitalis purpurea* (Scrophulariaceae).**
- **Digitalis is widely used in treatment of dropsy, a condition associated with congestive heart failure.**
- **The active principle is glycoside Digoxin.**



Digitalis, *Digitalis purpurea* (Scrophulariaceae)

Anthraquinone glycosides

- **Anthraquinone glycosides from a number of plants [including *Aloe* (Liliaceae), *Rhamnus* (Rhamnaceae), *Cassia* (Fabaceae or Leguminosae)] are widely used as laxatives.**

Aloe, *Aloe* sp., Liliaceae

Taxol

- The antitumor activity of taxol, a diterpene alkaloid from several *Taxus* species, was first discovered in the 1960's, but the alkaloid didn't become widely used until the mid 1980's.
- Taxol is useful for treating several types of tumors, but was originally developed for ovarian tumors.
- The alkaloid occurs in highest concentration in the bark.

Yew, *Taxus baccata*, Taxaceae

Ginkgo, *Ginkgo biloba*, Ginkgoaceae

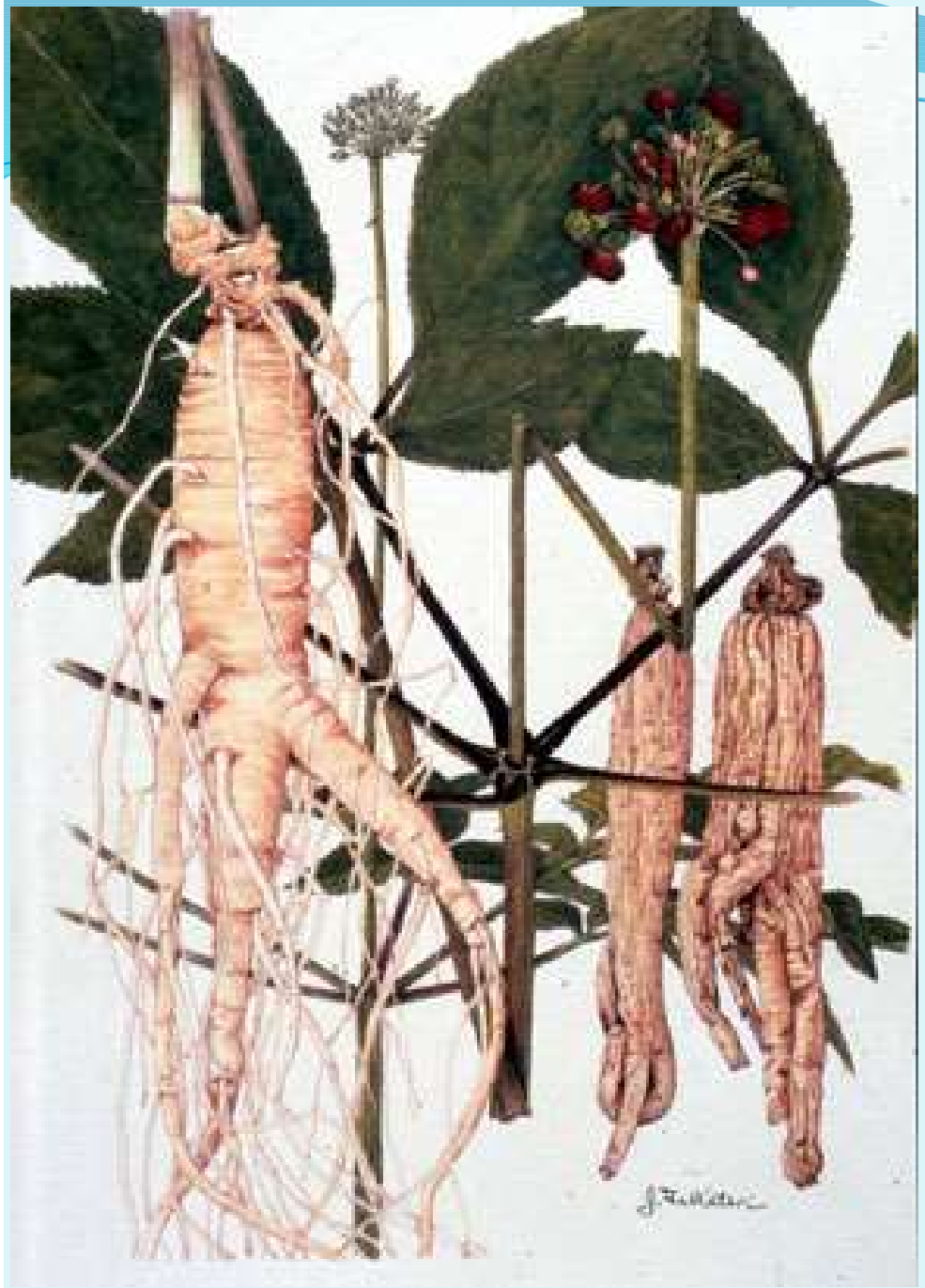
- **Extracts from the leaves of *Ginkgo biloba*, a gymnospermous tree from China, improve capillary blood flow and improve memory and some aspects of brain function.**

Ginkgo, *Ginkgo biloba*, Ginkgoaceae

Ginseng, *Panax ginseng*, Araliaceae

Ginseng has long been used as a way of maintaining health and for treating and curing many types of human ailments.

The active compounds are triterpenoid glycosides.



Ginseng, *Panax ginseng*, Araliaceae

Atis/Ativisha (*Aconitum heterophyllum*)

Family Ranunculaceae

Active principle Aconite

As astringent, tonic, diarrhoea, dyspepsia and cough, rheumatism , pain and fever.

Sag angur *Atropa Belladona*

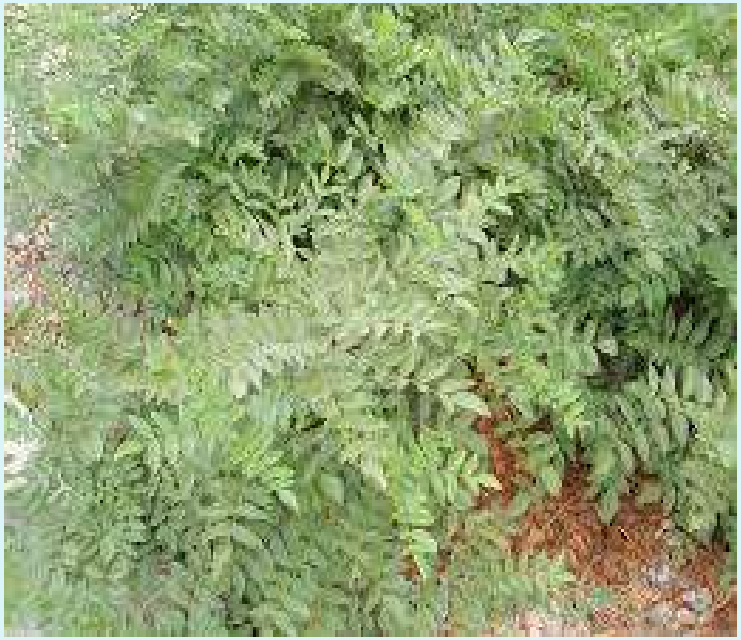
Family Solanaceae

Belladona

Alkaloids present are atropine and hyoscyamine
Used as sedative, antispasmodic, to relieve pain and for dilating pupil for Ophthalmological purpose

Mulhatti *Glycyrrhiza glabra*
Family Papilionaceae

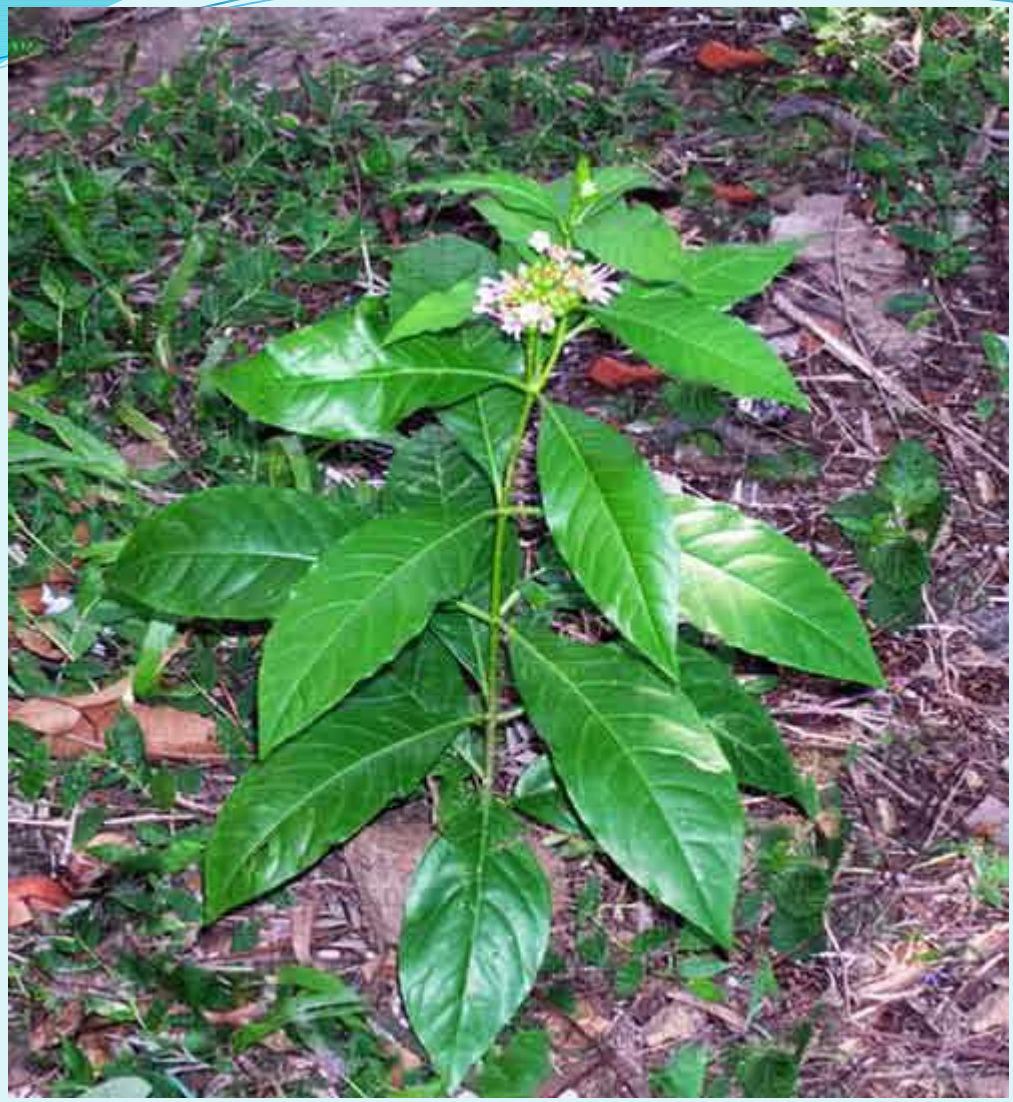
Has glycorrhizic acid, glycorrhizin
Used as emollient, laxative, expectorant
Given in cough, bronchitis, asthma, hoarseness of voice



Sarpgandha *Rauvolfia serpentina*
Family Apocynaceae

About 30 alkaloids reported, reserpine most important. Besides roots also have oleoresin , sterol, unsaturated alcohol.

Oleoresin shows hypnotic and sedative effect
Reserpine has lowering effect on blood pressure , sedative effect
Used for reducing blood pressure, as a sedative in mental disorders and insanity, treatment of skin disorders such as psoriasis, excessive sweating and itching, gynaecological ailments, heart problems etc.



Ashwagandha *Withania somnifera*
Family Solanaceae

Several alkaloids present in roots.

Used as tonic in geriatrics , relieves hand and limb tremors of elderly people
Regarded as aphrodisiac,, used for treatment of rheumatic pain, inflammation of joints, some paralysis conditions, for nervous disorders.

Hing *Ferula asafoetida*
Family Apiaceae

Oleoresin gum present in roots

Used in flatulent colic, dyspepsia, asthma, hysteria, convulsions, cholera, constipation, whooping cough, spasmodic disorders

Turmeric/ haldi *Curcuma longa*

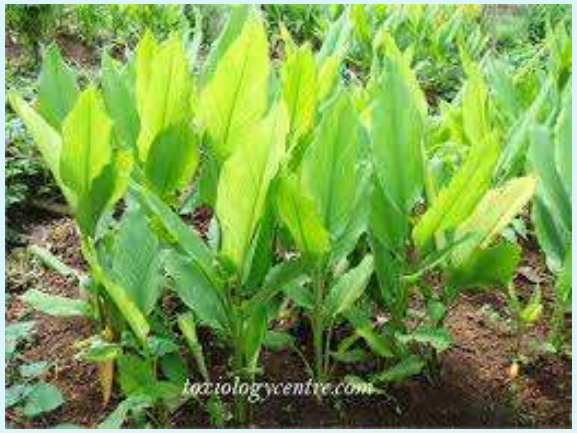
Family Zingiberaceae

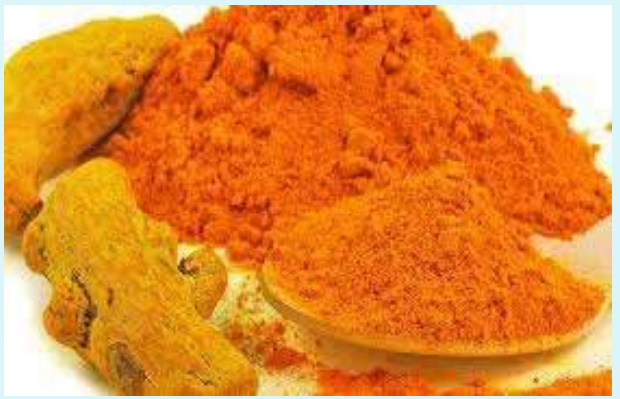
Rhizome is aromatic, stimulant, tonic and carminative.

Given in diarrhoea, intermittent fevers, dropsy, jaundice, liver disorders,

Urinary troubles.

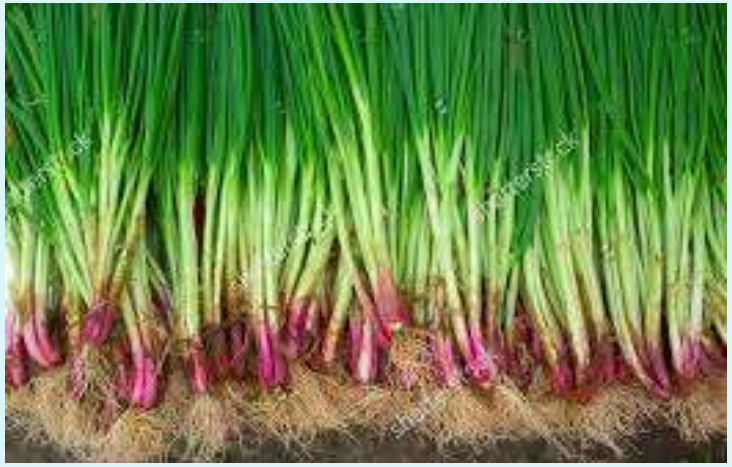
Fresh juice is used as antiparasitic for many skin problems.

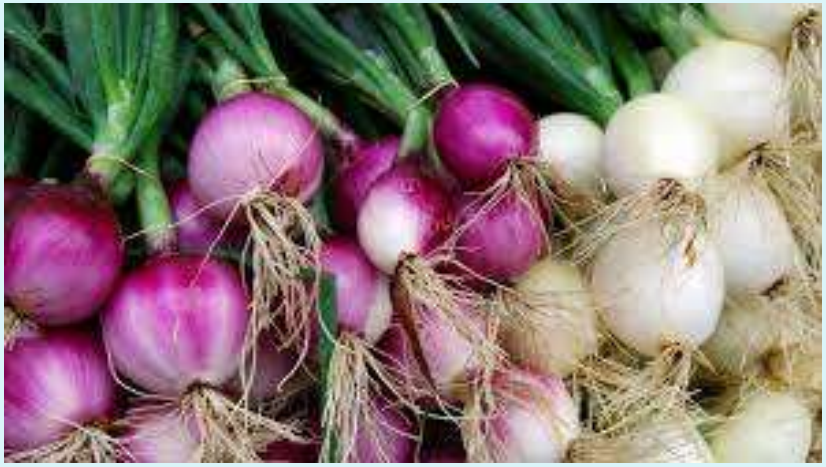




Onion/Piyaz *Allium cepa*
Family Liliaceae

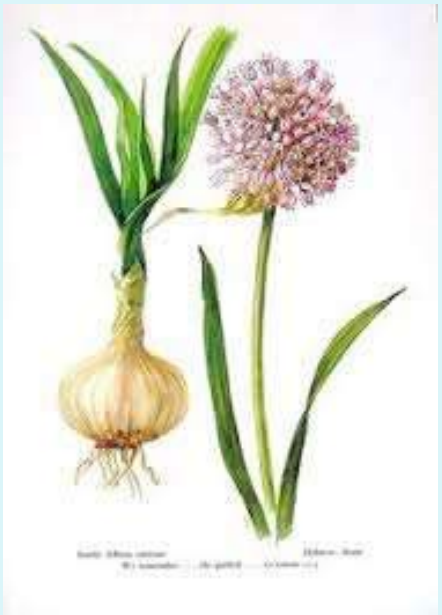
Bulb is a stimulant, diuretic expectorant. Given in piles, cough, jaundice, colic and scurvy, obstruction of the intestines and as a sedative.





Garlic/ Lahsun *Allium sativum*
Family Liliaceae

Given in fevers, cough, flatulence, disorders of the nervous system, whooping cough and bronchitis.



Ginger *Zingiber officinalis*

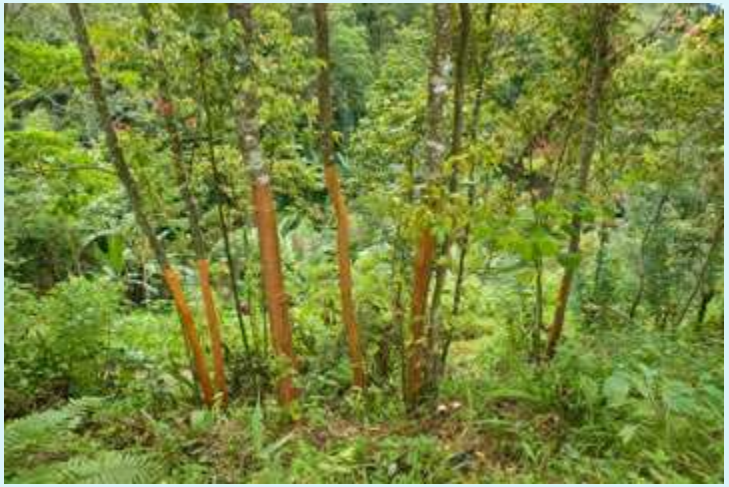
Family Zingiberaceae

Rhizome is used as stimulant, carminative and flavouring agent.

Given in dyspepsia and flatulent colic, disorders of the digestive system, piles, rheumatism, dropsy, neuralgia, cough and asthma.

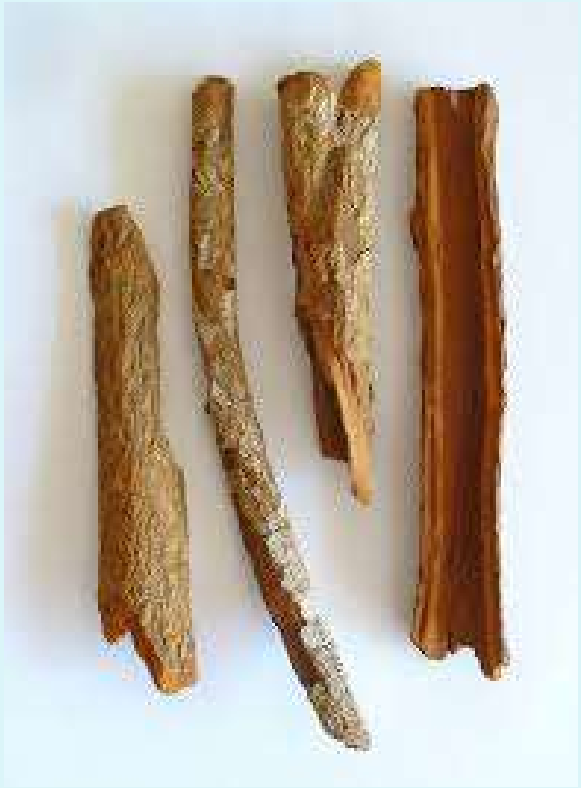
Cinnamon *Cinnamomum zeylanicum*
Family Lauraceae

Bark is aromatic, astringent, carminative and stimulant.
Given in diarrhoea, nausea, gastric irritation, flatulence, vomitting, toothache, paralysis of the tongue, neuralgic pains, severe headaches.



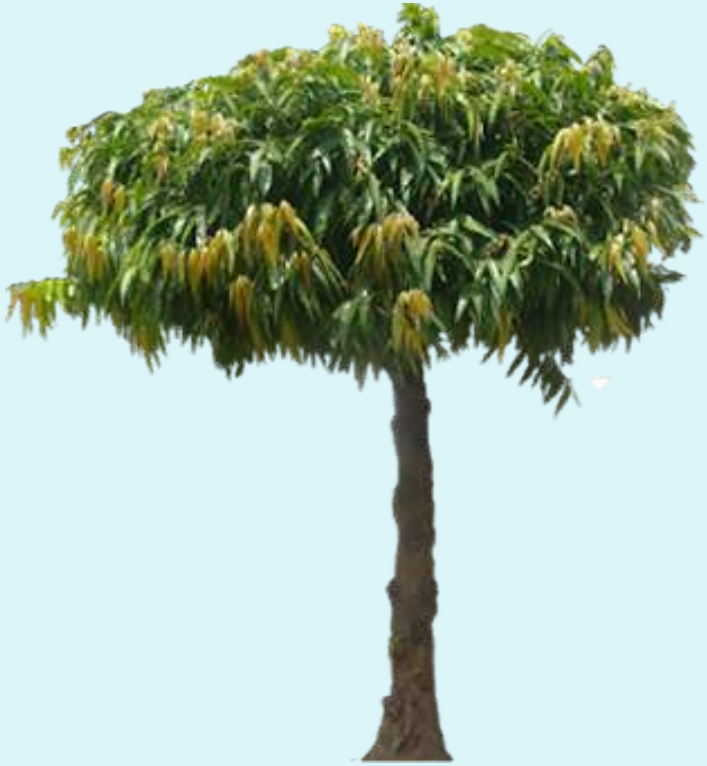
Quinine *Cinchona calisaya*
Family Rubiaceae

Used for cure of malaria, as an antiseptic.
Has around 29 alkaloids besides quinine.



Asoka *Saraca indica*
Family Caesalpiniaceae

Bark is astringent, decoction is given in uterine disorders, piles and dysentry.



Arjun *Terminalia arjuna*
Family Combretaceae

Bark is astringent, cardiac stimulant.

Given for heart diseases, also used for cleaning sores and ulcers.

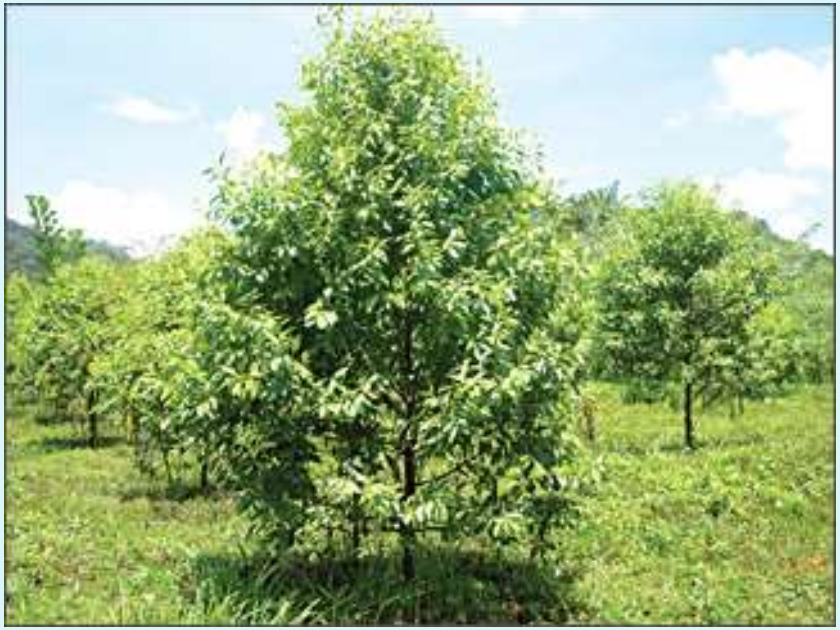
Khanda *Ephedra gerardiana*
Family Ephedraceae

Alkaloid ephedrine

Extract of stem is used for treatment of asthma, also as a cardiac and circulatory stimulant.

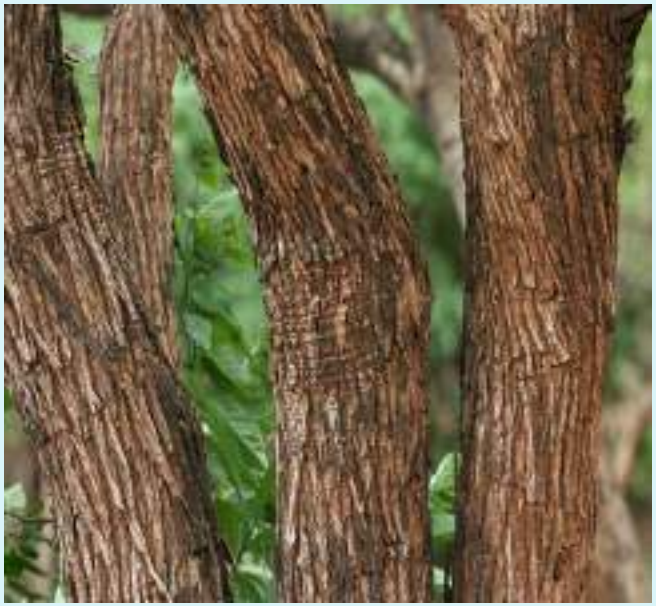
Safed chandan *Santalum album*
Family Santalaceae

Wood is cooling, astringent, seative, cardiac, tonic and diuretic.
Given in fevers and thirst, dressing in skin diseases, headache, as antiseptic and diuretic.



Kattha, khair *Acacia catechu*
Family Mimosaceae

Valuable astringent
Used in chronic diarrhoea, dysentry, bleeding piles, tonsils, ulceration of the mouth, tincture, used for bed sores.

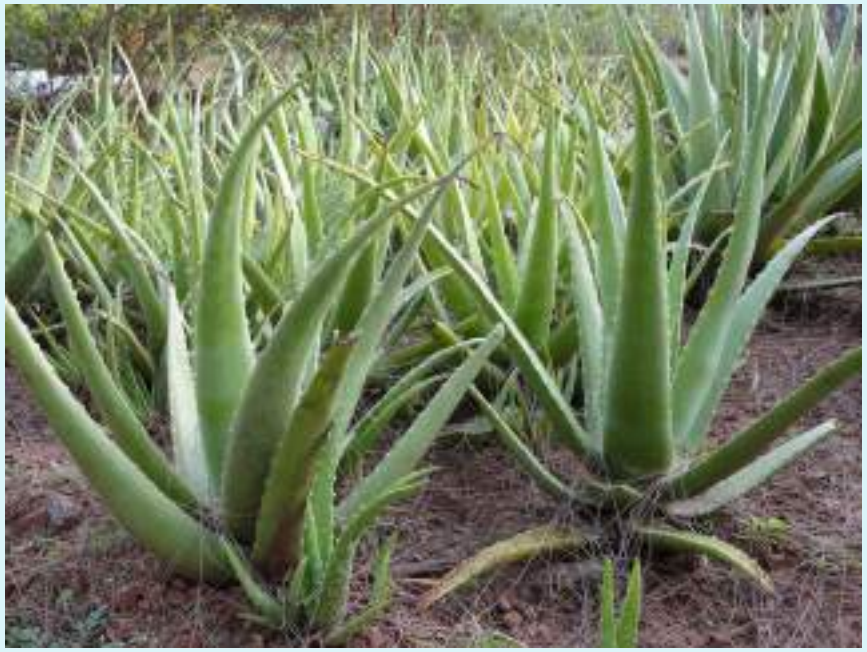




Vasaka *Adhatoda vasica*
Family Acanthaceae

Alkaloid vascine
Powerful expectorant and antispasmodic
Given in chest diseases, chronic bronchitis and asthma; diarrhoea and dysentry.

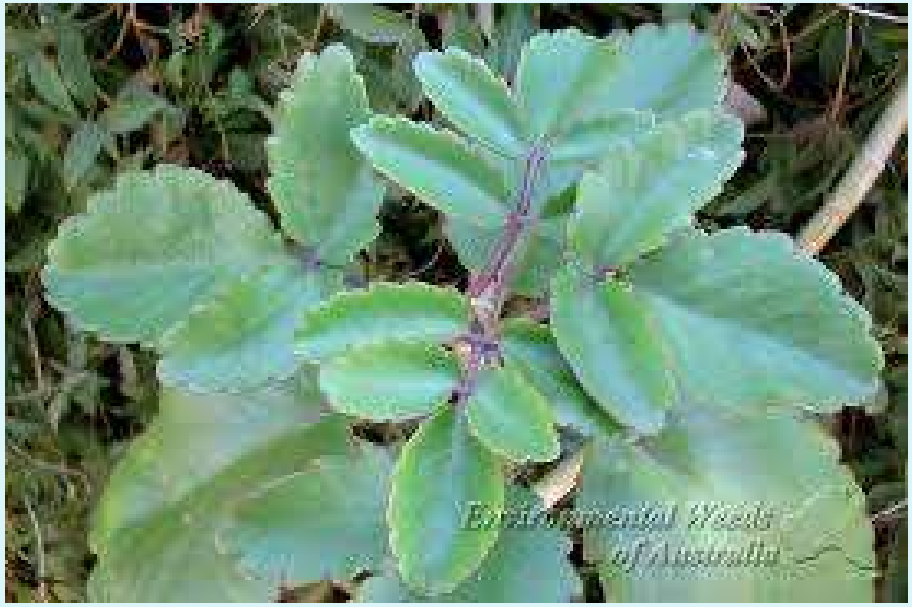
Ghritkumari *Aloe barbadense*
Family Liliaceae

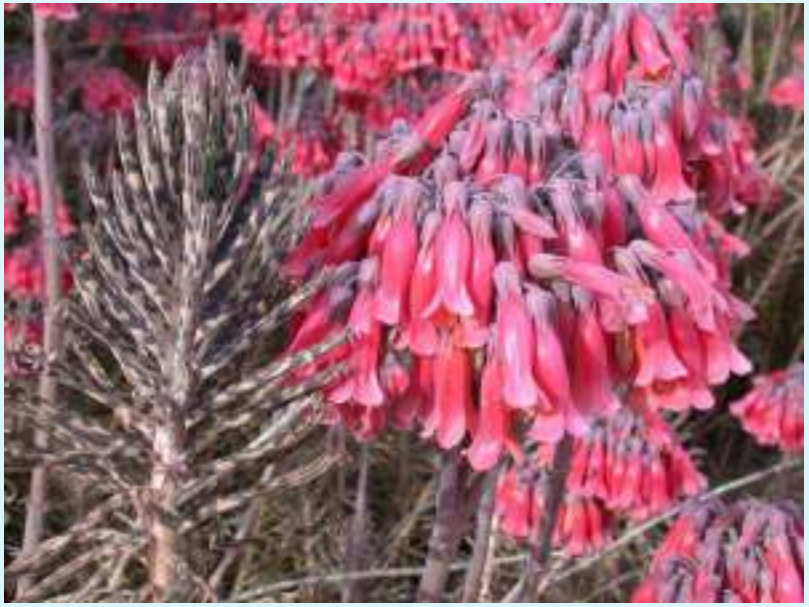
Given in fevers, enlargement of liver, spleen and glands, skin diseases, constipation , piles, jaundice.



Ghamri *Bryophyllum pinnatum*
Family Crassulaceae

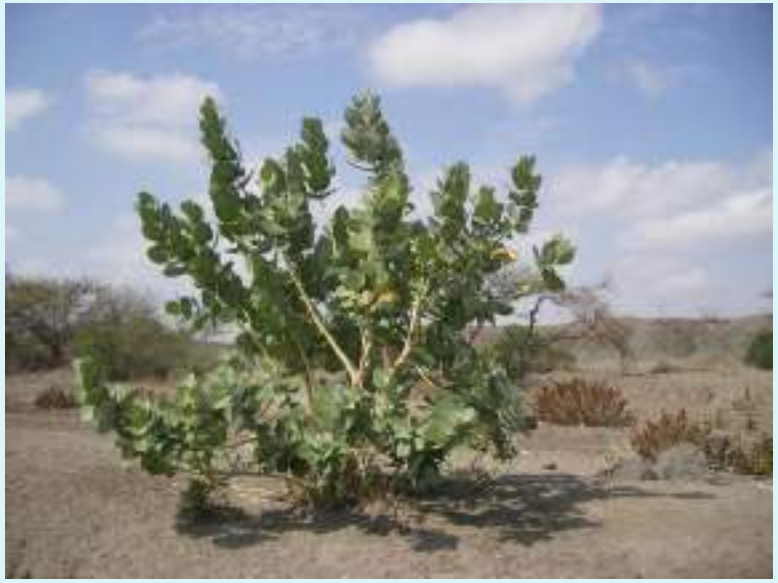
Given in diarrhoea, dysentry,cholera
Leaves astringent and antiseptic, are applied to wounds, bruises,
Boils, cuts, ulcers, bites of venomous insects.

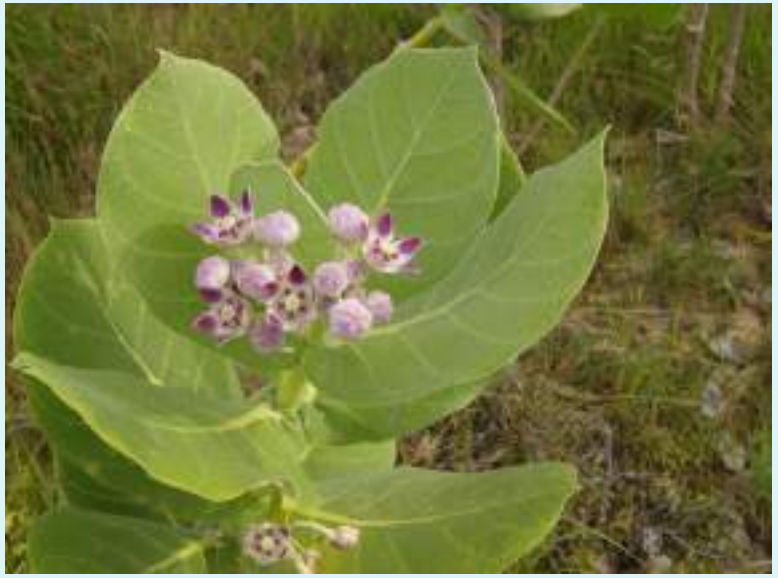




Ak *Calotropis procera*
Family Asclepiadaceae

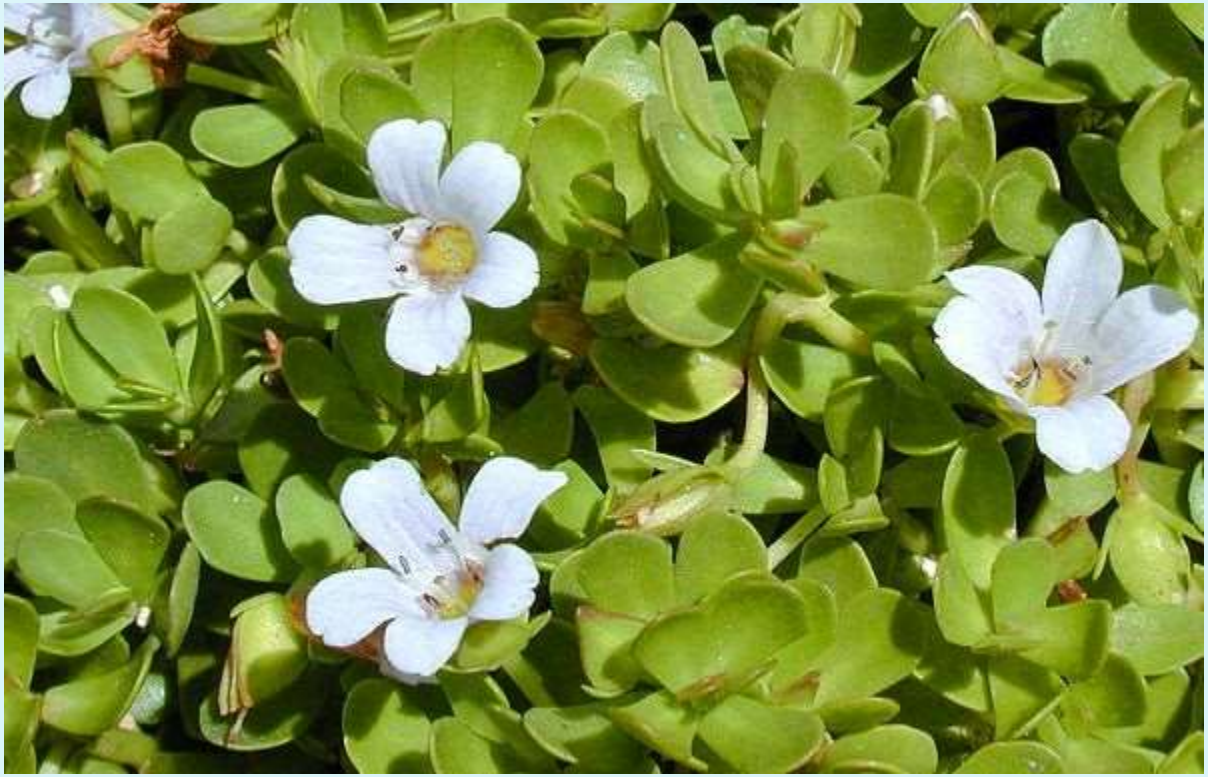
Used in dropsy and enlargement of abdominal viscera
Smoke of burnt leaves used for asthma and cough.
Leaf juice is used for skin diseases





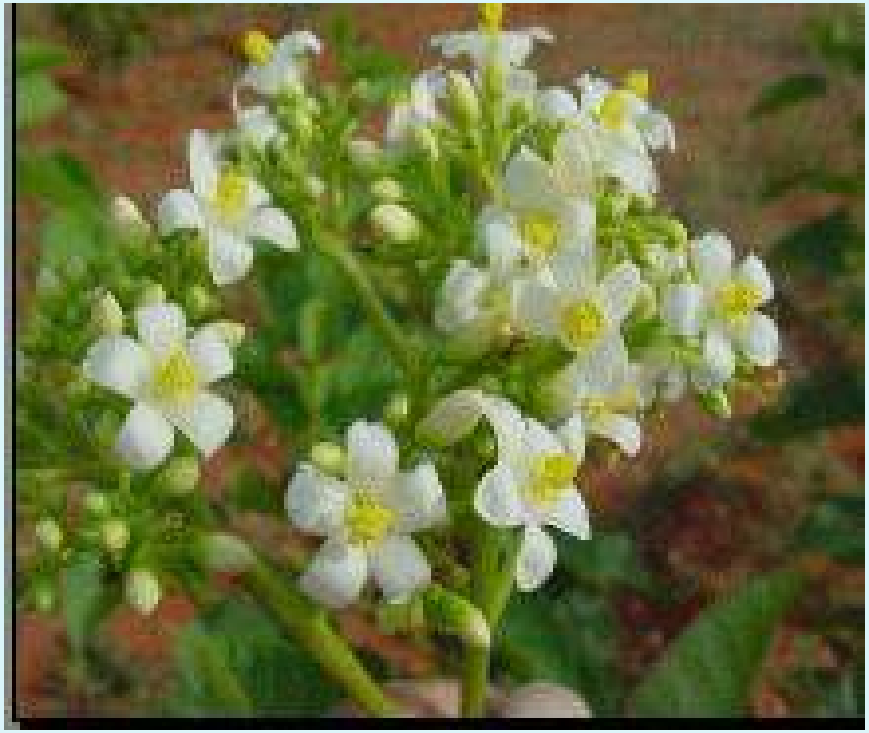
Brahmi / Indian pennywort *Centella asiatica*
Family Umbelliferae

Blood purifier, local stimulant, remedy for skin diseases, madness, cholera,nervous diseases, piles, mental weakness



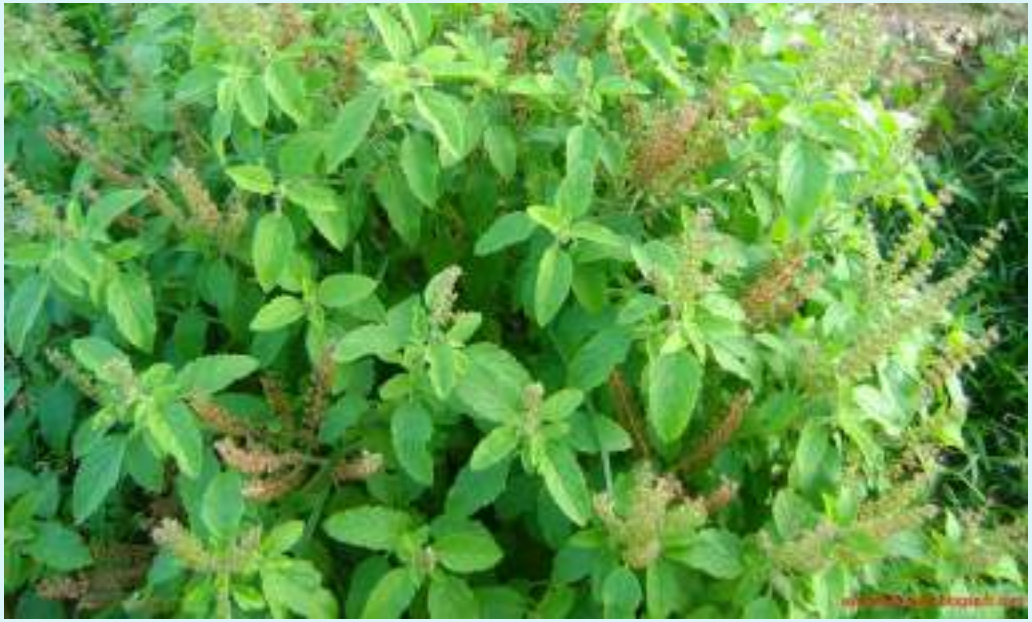
Safed arand *Jatropha curcas*
Family Euphorbiaceae

Applied to bleeding wounds, locally applied to piles, scabies, eczema, ringworm, itch and decayed teeth.



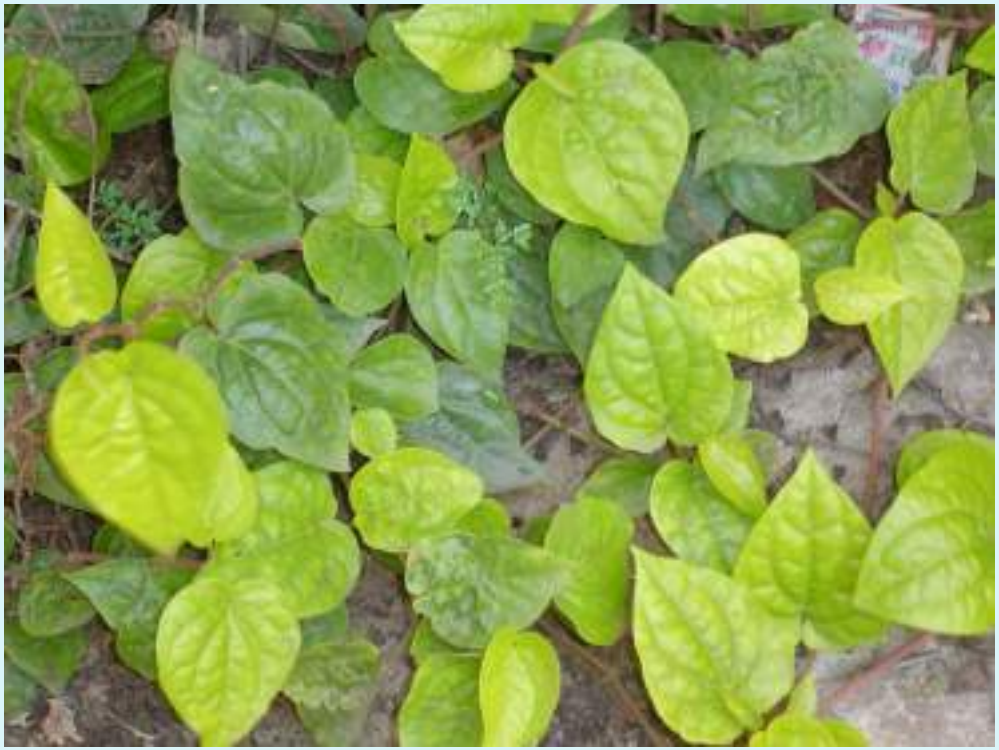
Holy basil Tulsi *Ocimum sanctum*
Family Labiatae

Leaves are expectorant, stomachic, diaphoretic and aromatic,
Decoction is given in malaria, gastric disease of children and liver disorders



Pan betel pepper Piper betle
Family Piperaceae

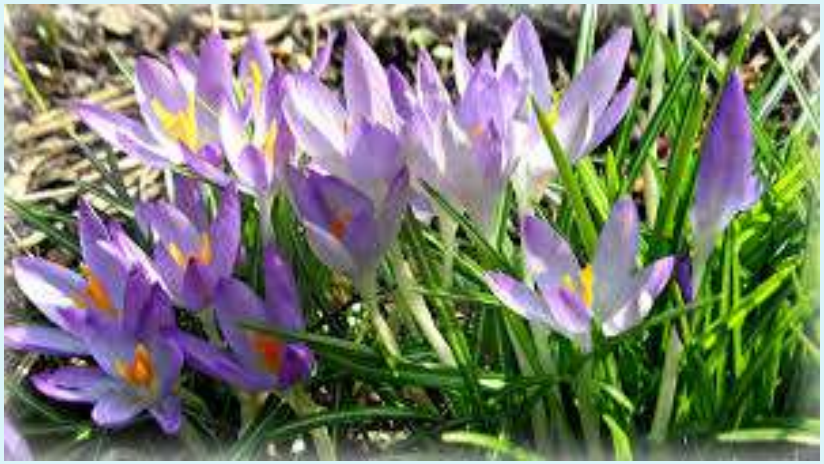
Leaves are astringent, aromatic, antiseptic, carminative, aphrodisiac, stimulant and expectorant.

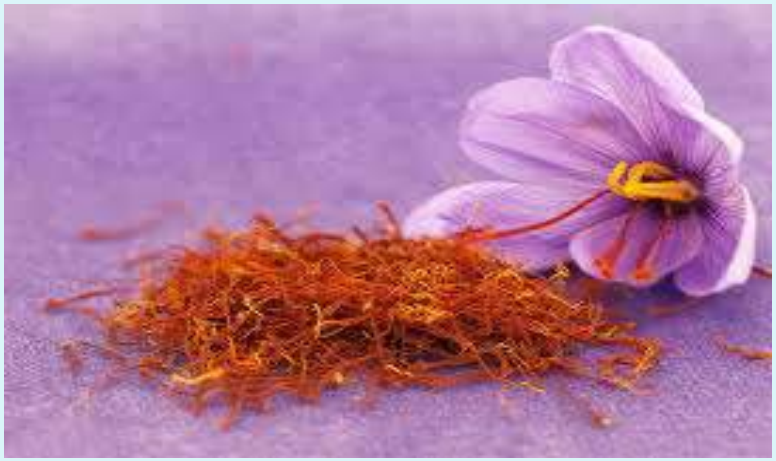


Kesar Saffron *Crocus sativus*
Family Iridaceae

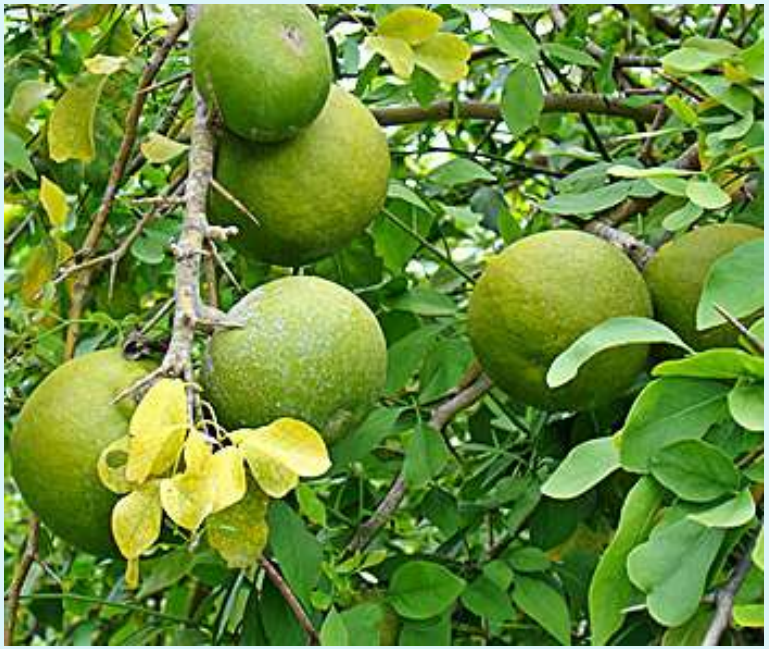
Bitter active principle Picrocrocin

Mild stimulant, stomachic, carminative, antispasmodic, nerve sedative, mild narcotic and diuretic.



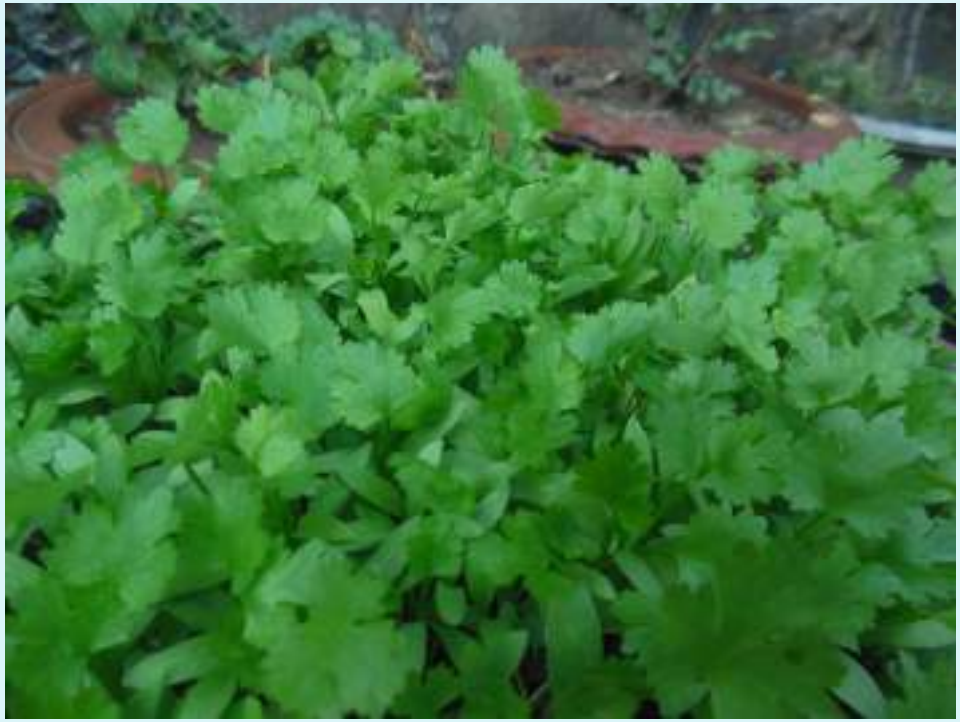


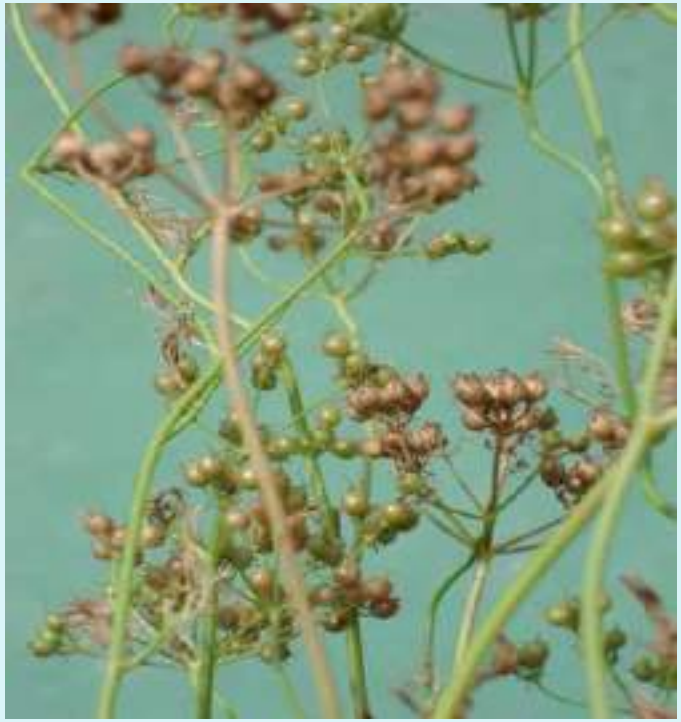
Bael *Aegle marmelos*
Family Rutaceae
Fruit is aromatic, astringent, cooling and laxative.
Given for diarhhoea and dysentry, irritation of alimentary canal



Coriander Dhania *Coriandrum sativum*
Family Umbelliferae

Fruit is aromatic, stimulant, carminative, antispasmodic, aphrodisiac.





Cumin Jeera *Cuminum cyminum*
Family Umbelliferae

Fruit good source of thymol, is stomachic, diuretic, carminative, stimulant, astringent

Part of Neem Tree	Medicinal Use
Leaf	Leprosy, skin problems, ulcers, intestine worms, anorexia, eye problems, epistaxis, cure of fevers
Bark	Analgesic, cure of fevers
Flower	Elimination of intestine worms, phlegm, bile suppression
Fruit	Diabetes, eye problems, urinary disorder, wounds, leprosy
Twig	Asthma, cough, phantom tumor
Gum	Scabies, wounds, ulcers, skin diseases
Seed	Intestine worms and leprosy
Oil	Intestine worms, skin diseases, leprosy
Root	Diuretic