

# **Subject- Botany**

**Credit – II**

**Chap 6- 3. Utilization and economic importance of Angiosperms: In food, fodder, fibers, horticulture and medicines.**

**Paper I- Plant Life and Utilization II**

**Term II, Sem – II**

**A Y 2020-21**

**By**

**Dr Shilpa Jagtap**

# Learning Objects

- Introduction
- Angiosperms as food
- Angiosperms as fodder
- Angiosperms as fibers
- Angiosperms as medicines.
- Angiosperms as horticulture

# Introduction

•Angiosperm, any of about 300,000 species of flowering plants, the largest and most diverse group within the kingdom Plantae. Angiosperms represent approximately 80 percent of all the known green plants now living.

•The angiosperms dominate Earth's surface and vegetation in more environments, particularly terrestrial habitats, than any other group of plants. As a result, angiosperms are the most important ultimate source of food for birds and mammals, including humans. In addition, the flowering plants are the most economically important group of green plants, serving as a source of pharmaceuticals, fibre products, timber, ornamentals, and other commercial products.

# Angiosperms as food

•The range of foods eaten by man includes cereals, pseudo cereals, pulses, nuts, root and fruit vegetables etc. Some foods, such as nuts, fruit and salad vegetables may be eaten raw, more often food is cooked.

## •Wheat : *Triticum aestivum*

- 1. Wheat is eaten in various forms by more than 1000 million people in the world.
- 2. In India, it is second important staple food crop next to rice.
- 3. Soft wheat is used for making chapatee, bread, cake, biscuits, pastry and other bakery products.



## •Rice : *Oryza sativa*

•In various countries such as India, China, Japan, and Korea, rice is used as major or staple food. Since its bread or chapatti cannot be prepared because of glutinine deficiency in the grains hence it is taken directly as food after cooking or boiling.



.2. Various food delicacies such as Idli, Dosa and Upma are prepared after fermentation generally in most of the parts of our country, but particularly in south India.

**.Maize : *Zea mays***

.Maize is extensively used for food, forage and cattle feed.

.2. The grain of maize is quite nutritious with high percentage of easily digestible carbohydrates, fats and proteins. The grains of maize are ground into flour and baked into chapattis.

.3. The grains of maize are roasted and eaten.

.4. Pop corn and corn flakes are prepared from the grains of maize.



**.Barley : *Hordium vulgare***

. Barley is important next to rice, wheat, maize in area and production.

.2. It is more suitable than wheat in India. Due to hardy nature, it can withstand adverse agro-environments like, drought, salinity, alkalinity, varied topography like plain, hill, under rainfed and irrigated conditions etc.

.3. It is a Rabi cereal crop and food for people of cooler and semi-arid part of the world.

.4. In India, 90% of barley is used as human food.

.5. It is also used for preparation of malt, beer, whisky, industrial alcohol and vinegar.

.6. Energy rich drinks like bournvita, boost, horlicks and biscuit are form by barley malt.



**.Sorghum: *Sorghum vulgare***

.Sorghum bicolor is an important crop worldwide and used for food, fodder and biofuels. Most varieties are drought and heat tolerant, and are important for arid regions, where the grain is one of the staples for poor and rural people. These varieties form important components of pastures in many tropical regions. S. bicolor is an important food crop in Africa, Central America, and South Asia, and is the "fifth-most important cereal crop grown in the world".



## Angiosperms as fodder

### •**Lucerne (Alfalfa) : *Medicago sativa***

•*Medicago sativa* is a perennial leguminous fodder crop. It has a good vegetative growth almost throughout the year.

•The population of rural and tribal areas use food crops of small grains as staple feed, cattle feed and fodder known as millets. The production of millets is highest in India. The main millets are bajra, sorghum etc.





# Angiosperms as fibers

## •Cotton : *Gossypium spp.*

- 1. Innumerable commodities of cloths are made from cotton.
- 2. From the lint chiefly textile and yarn goods, cordage, automobile tire cord, and plastic reinforcing are prepared.
- 3. The linters are a valuable source of cellulose.
- 4. Cotton hulls are used for fertilizer, fuel and packing.
- 5. Fiber from the stalk is used for pressed paper and cardboard.
- 6. The seed which remains after the ginning is used to produce oil.
- 7. The cotton seed meal that is left generally is fed to ruminant livestock.



**•Jute : *Corchorus Sp.***

- 1.Jute is used to make rugs, blankets, carpets, tarpaulins, cloth backing, carpets, linoleum and oilcloth, twine, rope, upholstery, curtains and coarse cloth.
- 2. The leaves of young shoots are an important source of vegetable food in Egypt, Sudan and Greece.
- 3. Jute butts are used for the manufacture of paper and paperboard.



**•Sun Hemp : *Crotalaria juncea***

- 1. Sun hemp is essentially a cordage fibre and is used in the manufacture of ropes, twines, cords and marine cordage.
- 2. Also finds application in the manufacture of sailcloth, canvas, matting, sacking, and rope soles of shoes and sandals etc.



.3. Besides, being resistant to deterioration in water, sun hemp is used for making fishing nets and marine cordage. 4. In India, it is largely used for ropes and cot stringing.

.5. Because of high cellulose and low ash content, the fibre is particularly suitable for cigarette paper and high quality tissue paper.

### **.Coconut : *Cocos nucifera* L.**

.1. Besides its main use as floor covering and in rope making, coir fibre extends extensive use as packaging material to protect goods against shock in transport.

.2. Coir fibre finds its use in the production of activated carbon, artificial horsehair, paper pulp, roofing tiles, writing boards, thermal insulation, high stretch paper, manufacture of olive oil filters etc.



•3. The coir is rubberised for making cushion seating for automobiles and railways.

•4. Coir bags are used in tea estates for collecting tea leaves and for transportation.

•**Silk Cotton/ Kapok : *Bombax cieba***

•The fibre of *Bombax cieba* is light, very buoyant, resilient, resistant to water, but it is very flammable.

•2. It is used as an alternative to down as filling in mattresses, pillows, upholstery and stuffed toys such as teddy bears and for insulation.



# Angiosperms as medicines.

•Medicinal and aromatic plants occupy an important place in the life of mankind. There are about 1,500 medicinal plants in India.Traditional societies use native wild plants for medicinal purposes.

## •**Aswahagandha** :*Withania somnifera* Dunal

•tonic, deobstruent, diuretic, narcotic, abortifacient.  
Used in rheumatism,consumption , debility from old age, Cough, Nervous disorder and in hypertension

## •**Ashoka**: *Saraca asoca*

•It is also reported to cure biliousness dyspepsia, dysentery, colic, piles and pimples. Leaves possess blood purifying properties. Flowers used in dysentery and diabetes.



## 6.6 ANGIOSPERMS IN MEDICINES

### 1. *Withania somnifera* (Ashwagandha):

It is used as general tonic, stimulant, aphrodisiac, narcotic and rejuvenator. It is also used to treat scrofula, ulcera, debility from old age, dropsy, cough, nervous disorders, insanity and hypertension.



### 2. *Atropa belladonna*: It contains an alkaloid named hyoscyamine and scopolamine. It helps in reducing spasmodic cough and acts as sedative to the respiratory system.

### 3. *Apium graveolens* (Celery):

The root is the source of the commercial drug.

**Uses:** The root has diuretic properties and is given during dropsy and colitis.



### 4. *Plumbago zeylanica* (Chitraka):

Chitraka is a perennial herb found growing in the plains of India. Plumbagin is a secondary metabolite when consumed internally causes irritation and contraction of the smooth muscles and uterine walls. As such it is given to induce abortion.



### 5. *Citrullus colocynthis* (Colocynth):

The root has a bitter taste and pungent, cooling and antipyretic properties. It is used as a carminative and anthelmintic and given in dropsy, tumours, asthma, jaundice, leucoderma, bronchitis, spleen and liver enlargements. It is administered to relieve urinary troubles, constipation, anaemia, rheumatism and elephantiasis.



### 6. *Saussurea lappa* (Costus):

The roots have medicinal value and are used as a tonic, carminative and for treating fever, skin diseases, cough and bronchial asthma.



7. **Taraxacum officinale (Dandelion root):**

Dandelion root is a simple tap root measuring about 30 cm long and 15 to 25 mm broad. It may be used either fresh or dried. The root contains small amount of a bitter substance taraxacin, choline, resin and taraxasterol and homotaraxasterol. It is used as a simple and mild laxative and is given to relieve habitual constipation.



8. **Rauvolfia serpentine (Sarpagandha):**

It contains an alkaloid named reserpine which is used for treating insanity, high blood pressure, insomnia, hypertension, and irritable condition of the nervous system. The roots may be given during diarrhoea and dysentery. Raudixin, Ralfen and Adelphene are made from this.



9. **Glycyrrhiza glabra (Jesthamadh):**

The dried roots are cut in to pieces and used as emollient, laxative and expectorant. It is commonly used against thirst, pain cough, breathing problem, asthma and catarrhal conditions of bowel and urinary passages.



10. **Allium cepa (Onion):**

The presence of sulphur compounds imparts antiseptic properties. It acts as a stimulant, diuretic and expectorant. It is useful in flatulence and dysentery. Onion has been found useful for various gastric and intestinal disorders. Onion prevents thrombosis, heart attacks and paralysis. Fresh onion juice is administered in intestinal and gastric disorders.



11. **Allium sativum (Garlic):**

The medicinal value of garlic is numerous. It is administered during fevers, coughs, disorders of the nervous system, bronchial disorders and whooping cough. Garlic juice is an excellent relief for earache. The syrup of crushed garlic is a good remedy for lung and chest disorders. Various ailments like hysteria, sciatica, flatulence may be relieved by intaking a decoction of garlic with milk and water.

**12. *Colchicum luteum*:**

It is used to relieve pain and inflammation in severe gout affections.



**13. *Saraca indica* (Ashoka):**

The bark is highly astringent and its extract is given in various uterine disorders such as leucorrhoea and menorrhagia. The decoction of the bark is an effective remedy for piles and dysentery.



**14. *Terminalia arjuna* (Arjun):**

It is valuable remedy against heart diseases. A mixture of the dmg along with honey is given during fractures. Its astringent properties are exploited for cleaning ulcers, sores etc. and the bark extract along with honey is used as an Ointment against pimples, acne etc.

**15. *Coriandrum sativum* (Coriandrum):**

Annual bears small spherical fruits of economic importance.

**Uses:** The small fruits are highly aromatic, carminative, stimulant, diuretic, aphrodisiac and refrigerant. A decoction prepared from the dried fruit is given in relieve colic pains, flatulence and bleeding piles. The infusion of the fruits is a useful eye-wash in conjunctivitis. The volatile oil distilled from the fruit is effective for rheumatism and neuralgia.



**16. *Cuminum cyminum* (Cumin):**

It contains thymol, of medicinal value.

**Uses:** It is a diuretic, stimulant, astringent, stomachic and emmenagogue and is commonly prescribed in diarrhoea, dyspepsia and hoarseness of voice. Cumin water has carminative properties and is given in flatulence and griping pain of the stomach.



**17. *Emblica officinalis* (Awla):**

It bears spherical, pulpy, light green fruits in a cluster and is one of the richest sources of vitamin C. The fresh fruit is an excellent tonic, antiscorbutic, diuretic and laxative. *Morawla* prepared from





# Angiosperms as horticulture

growing in Assam, Sikkim and Khasi hills. The soft stems are very useful in making baskets.

## 6.5 ANGIOSPERMS IN HORTICULTURE

1. **Magnolia grandiflora (Kavatchapha):** Cultivated for fragrant and showy flowers.
2. **Michelia champaka L. (Sonchapha):** Usually cultivated near temples and in gardens for its fragrant flowers. Flowers are used in extraction of essential oils. Medicinally used in treatment of kidney troubles, gonorrhoea and blood cancer.
3. **Drimys winterii (Winter bark):** Cultivated for ornamental and fragrant flowers.
4. **Cleome spinosa:** Scented herb, grown as ornamental.
5. Most of the species are cultivated for their showy flowers e.g. Aster, Dahlia, Chrysanthemum, Gerbera, Helichrysum, Tagetes and Zinnia.
6. The family includes a large number of ornamentals such as Barleria, Thunbergia, Pachystachys, Eranthemum and Acanthus.
7. **Mangifera india (Amba):** Cultivated for its tasty fruits and fruits are also used to make various bi products.
8. **Acharus sapota (Chiku):** A fruit tree cultivated in gardens for its fruits which has great medicinal value and are rich in antioxidants.



9. **Psidium guajava (Peru):** A fruit shrub cultivated for delicious fruits and it is rich in vitamin C and antioxidants.
10. **Punica granatum (Dalimb):** Cultivated in gardens for medicinally valued fruits.

# REFERENCE

- MBO-07 Vardhman Mahaveer Open University, Kota Plant Ecology, Plant Resource Utilization and Biodiversity Conservation
- <https://www.britannica.com/plant/angiosperm>