

MODULE 37 - SILK COTTON TREE: KAPOK

OBJECTIVES

By the end of this session students will be able to:

1. Know more about the Silk Cotton plant.
2. Understand its morphology etc.
3. Learn about the uses of the flowers, fruits, leaves etc of the silk cotton plant.

SUMMARY

Rakta Pushpa, popularly known as 'Semal tree' has been quoted in ancient Indian literature due to its royal look, large flowers and selfish nature – selfish because it gets pollinated by birds, but disappoints birds due to presence of floss inside fruits instead of juice. Semal is a fast growing tree and is the father of the match industry. Its light wood is used to manufacture match boxes and splinters.

Semal tree is eco-friendly as it provides dwelling place to vultures, which are now considered as critically endangered species.

This film carries the message regarding cultivation of this tree, mixed with Shisham, Teak, Sal and Acacia. It will not only beautify the avenues and gardens but will also provide raw material for few industries and will save vultures, kites and eagles from extinction.

TRANSCRIPTION

1. CLASSIFICATION

Red silk cotton tree belongs to the family Bombaccaceae, a family of tropical trees like Bombax, Ceiba and Adansonia.

Genus Bombax has 60 species, out of which the common is Bombax ceiba, popularly known as Semal. Its old names are Bombax malabarica or Salmalia malabarica because of its origin in Malabar.

2. GROWTH HABIT

Due to giant size, Semal is called the 'King of the Tropical Forest'. The tree attains a height of upto 40 meters and girth of upto 2 meters. Its branches spread horizontally all around. The main trunk bears root-buttresses at the base in order to balance the weight of the tree.

3. BRANCHES, BARK & LEAVES

The young stem and branches are covered with short, straight, stout prickles, about one c.m. long and with woody, conical base.

Samal produces scaly bark, 2-2.5 c.m. thick. The bark is smooth in the beginning and becomes rough on maturity due to vertical cracks. These cracks are actually lenticels formed for exchange of air.

The leaves are palm-like, palmate, compound or digitate, with five to seven leaflets. The leaf is 15-30 cms long, while each leaflet is 10-20 cms. long. The leaflets in the centre are longer than those on the sides. Being deciduous, leaf fall is in autumn.

4. FLOWERS

The flowers are large, red in color. Flowering period is from January to March. They are very attractive, showy and visible from a long distance. Their diameter is about 10-12 cms. The flower is regular, bisexual, pentamerous, and hypogynous.

Calyx

The calyx is made of five green sepals, fused at base, thick and fleshy, full of nectar, aestivation valvate.

Corolla

Corolla is made up of five scarlet red petals, free, with twisted aestivation. They form scarlet carpet on the ground for 2-3 weeks after dropping from the tree.

Stamens

Stamens are in 5 bundles, numerous in number. This condition is called polyadelphous and is an important feature of the family Bombaceae. The filaments are large, anthers dithecas.

Gynoecium

Gynoecium is pentacarpellary, syncarpus, ovary superior, pentalocular, with axil placentation. Each chamber of ovary has several ovules. That's why the fruit is full of several seeds.

The floral formula of Rakta Pushp is:

Bracteate; actomorphic; bisexual; calyx of five sepals, fused; corolla of five petals, free; androecium of several stamens, polyadelphous, in bundles of five; gynoecium pentacarpellary, syncarpous, ovary superior, pentalocular, with axile placentation.

The floral diagram of Rakta Pushpa is:

Pollination

Pollination is done by birds.

Seeds

There are innumerable seeds covered by fibres or floss. The floss helps in the dispersal of seeds. The seeds are 6-9 mms in size and contain oil.

5. GENERAL DISTRIBUTION

In India, Semal tree is common in valleys, flat ground, as well as stream banks. It forms a good association with Sal tree. That is *Shorea robusta*.

Other than India, it can also be found in Sri Lanka, Pakistan, Bangladesh, Myanmar, Java, Sumatra and Northern Australia.

6. USES

Semal tree becomes ready for felling within 20-30 years. Its wood is very soft and light. It is dried in the open sun or by kiln drying method. Dry wood is useful in match industry. By peeling on rotary lathe it can be used to prepare packing boxes, brush handles, wooden coiling and coffins. It is also used to make boats.

The floss is used to prepare life jackets, for stuffing cushions and pillows. It is also used as insulating material for refrigerators and ice boxes.

Roots of a 1-2 year old Semal tree are called 'Semal musli'. It is used as an aphrodisiac, just like 'safed musli'.

The gum is analgesic, stimulant and anti-dysenteric. It is also useful in giardiasis and diarrhea.

Seed oil is used in the manufacture of soap and lubricants.

Young flowers are used as vegetable or pickles.

GLOSSARY

1. Abode = Dwelling place.
2. Chariot = A horse drawn vehicle with two wheels.
3. Dendrology = Study of trees.
4. Floss = Any silky, filamentous matter. The cottony fiber yielded by the silk-cotton tree.
5. Tropic = Of, pertaining to, characteristic of, or occurring in the tropics.
6. Compound leaf = A leaf made up of several leaflets.
7. Polyadelphous = Stamens fused by filaments in several tubes.
8. Pollination = Transfer of pollen grains from anther to stigma.
9. Coppices = New branches originating from cut end of old trunk.
10. Monoculture = Growing several plants of same species at one place.
11. Polyculture = Growing several plant species in the same area.
12. Coffin = Wooden box for carrying corpse.
13. Scabbard = Wooden cover for sword.
14. Shingle = Thin piece of wood, slate, metal, asbestos, or the like, usually oblong, laid in overlapping rows to cover the roofs and walls of buildings.
15. Aphrodisiac = A drug, food, etc, that excites sexual desire.
16. Critically endangered = On the brink of extinction.
17. Ecofriendly = Befitting the environment.
18. Giardiasis = Intestinal infection by a protozoan *Giardia*, resulting in loose motions.

F.A.Qs.

Q1. Write two popular English names of Rakta Pushpa?

Ans: 1. Silk cotton tree.
2. Red silk cotton tree.

Q2. What is the trade name of Rakta Pushpa?

Ans. Semal.

Q3. What is the botanical name of Rakta Pushpa ?

Ans: Bombax ceiba.

Q4. What are the synonyms of Bombax ceiba?

Ans: 1. Bombax malabarica. 2. Salmalia malabarica.

Q5. Which family does Semal belong to?

Ans: Bombacaceae.

Q6. In what type of forest is Semal found?

Ans: Tropical forest.

Q7. Is Semal tree evergreen or deciduous ?

Ans: Deciduous.

Q8. What is the native home of Semal tree?

Ans: Malabar.

Q9. How many species of Bombax are found in the world ?

Ans: 60.

Q10. Upto what height can Bombax grow?

Ans: 40 meters.

Q11. What is the nature of branching in Bombax?

Ans. In whorls or all around the stem.

Q12. What are buttresses?

Ans: These are plank-like roots which originate from the base of main trunk and support the main stem as well as the canopy of branch. Buttresses are partly stem and partly roots, that means their above ground part has stem like anatomy, while the underground part has root like internal structure.

Q13. What is peculiar feature of young stem and branches?

Ans: They are covered with sharp, straight, stout prickles, with wood conical base to protect the plant from grazing animals.

Q14. What types of bark is found in Semal tree?

Ans: Scale bark having thickness of about 2.00 cms.

Q15. What type of leaves is found in semal tree?

Ans: Palmate, compound, digitate, having 5 to 7 leaflets. The size of leaf is 15 to 30 cms long and each leaflet is 10-20 cms. long. The leaflets look like fingers in palm; in the centre they are longer just like the fingers in the human palm.

Q16. The bark of Semal shows oval cracks. What are they?

Ans: Lenticels meant for exchange of gases, specially oxygen and carbon dioxide during respiration.

Q17. What is the flowering period of Bombax?

Ans: January to March.

Q18. What are the characters of Semal flowers?

Ans: Large, showy, scarlet red, fleshy, about 10-12.5 cms. across. In some varieties the flowers may be yellow or orange in color.

Q19. What are the botanical characters of Semal flower?

Ans: Regular, pentamerous, hypogynous, bisexual, complete.

Q20. What is the nature of calyx in Semal flower?

Ans: Gamosepalous, made up of 5 green fleshy sepals, fused, cup shaped. They secrete nectar.

Q21. What is the nature of petals in Semal flower?

Ans: Polypetalous, made of 5 petals, free and twisted, about 7-8 cms long, bright red (rarely yellow or orange in colour). They are fleshy and at tip so that stamens and stigma are exposed for pollination.

Q22. What is the nature of androecium in Semal?

Ans: It is made of infinite number of stamens which are fused by their filaments at base in 5 bundles. This condition is called polyadelphous.

Q23. What is the nature of gynoecium in Bombax?

Ans: Pentacarpellary, syncarpous, made up to 5 carpels fused; ovary superior, pentalocular, with axile placentation. Each locule has several ovules which, on fertilization, form seeds. That's why the fruit has several seeds. There is single terminal style with 5 stigmas.

Q24. What is floral formula of Semal flower?

Ans: It means that the flower is actinomorphic, bisexual having five sepals fused; five petals free; indefinite stamens in five bundles; gynoecium pentacarpellary, syncarpous, ovary superior, pentalocular, with axile placentation.

Q25. What is the agency of pollination in Semal?

Ans: Birds like crows, bulbuls, and mynah are seen to chatter around each tree in bloom. They hanker for the sip of nectar from the flowers.

Q26. What happens to the flowers which fall on the ground?

Ans: They form a red carpet on the ground for 2-3 weeks. They are eaten by deer. Village folk also consider them to be edible in the form of vegetable or pickles.

Q27. What type of fruit is formed in Semal?

Ans: Dry, dehiscent, capsule, bursting in five valves so that the seeds with fluffy cotton become free from their confinement.

Q28. What is the nature of seeds in Semal?

Ans: the seeds are covered with long, silky hairs or floss for dispersal by wind.

Q29. What is the natural distribution of Semal?

Ans: Semal is distributed in nature in India, Sri Lanka, Myanmar, Java, Bangladesh, Sumatra and Northern Australia.

Q30. What type of climate is preferred by Semal?

Ans: Moist, tropical climate.

Q31. What is the flowering time of Semal?

Ans: February-March.

Q32. Which animals eat the flowers fallen on the ground?

Ans: Rats, deer, squirrels.

Q33. When do fruits of Semal ripen?

Ans: April-May.

Q34. Why is Bombax called 'Silk Cotton Tree'?

Ans: Due to silky hairs and seed.

Q35. What type of germination takes place in Bombax?

Ans: Epigeal, because cotyledons come above the soil.

Q36. Which stage is most delicate in the life of Bombax?

Ans: Seedling stage; because it is easily attacked by rabbits, rats, rats and porcupines.

Q37. To which climate condition are Bombax seedlings sensitive?

Ans: Frost.

Q38. Which part of the plant protects Semal tree from fire?

Ans: Thick bark.

Q39. What are coppices?

Ans: Branches originating from cut part of main trunk or burnt stem.

Q40. What is monoculture?

Ans: Growing the population of single tree at a place. It is also called 'pure culture'.

Q41. What is polyculture?

Ans: Growing a plant in association with other plants e.g. growing Semal tree in association with Dalbergia sissoo and Zizyphus.

Q42. Out of monoculture and polyculture which gives better results for growth?

Ans: Polyculture, due to association of Zizyphus Semal is saved from being grazed upon by animals. Hence its growth is better.

Q43. What is the size of pit for plantation of Semal tree?

Ans: 30cms X 30 cms.

Q44. What should the space between two subsequent trees of Semal be?

Ans: 3.7mts for monoculture & 7.4mts for polyculture. In polyculture the trees like Shisham or Acacia are grown to save Semal from grazing animals.

Q45. Does Semal cultivation require pruning?

Yes. After 2-3 yrs lower branches are cut so that the main trunk grows in length.

Q46. Which insect damages Semal tree?

Ans: *Jonica neiviera* is a shoot borer which attacks seedlings and ultimately kills the plant.

Q47. Which insect destroys the seeds of Semal?

Ans: *Dysdercus cingulatus* sucks out the juice from seeds. The result is that the seeds lose their germination capacity.

Q48. Which fungus attacks Semal?

Ans: *Ganoderma lucidum*, a root rot fungus.

Q49. Which plant parasite attacks Semal?

Ans: *Loranthus*, popularly known in India as 'banda', a semi-parasite, sometimes attacks leafy shoots of Semal.

Q50. What protective measures can be taken to save Semal tree from various attackers?

Ans: Natural method is polyculture. Insecticides may be used in the case of monoculture.

Q51. What are the uses of Semal wood?

Ans: Semal wood is used to manufacture match boxes and matchsticks. It is also used to manufacture plywood and packing cases. Other uses of the wood are in the manufacture of toys, coffins, brush handles, shingles, scabbards and boats.

Q52. What are the uses of floss of Semal?

Ans: The floss from Semal seeds is used for stuffing cushions, pillows, lifejackets and insulating material for refrigeration.

Q53. What is 'Semal Musli'?

Ans: These are one or two yr old roots of Semal which have medicinal importance. They are used as aphrodisiac, just like 'Safed Musli', i.e. chlorophytum.

Q54. What is 'Mocha ras'?

Ans: It is the gum of Semal.

Q55. What are the different uses of 'Mocha ras'?

Ans: It is used to control diarrhea and giardiasis and kidney stone.

Q56. What is the use of seed oil of Semal?

Ans: Seed oil is used in the manufacture of soap and lubricant.

Q57. Which parts of Semal are used as vegetable?

Ans: Flower buds and sepals are used as vegetable or pickles.

Q58. Why is Semal preferred as an ornamental as well as avenue tree?

Ans: Due to deliquescent (umbrella like) habit it has royal look and large size scarlet flowers, Semal is cultivated as an ornamental tree in gardens as well as avenues.

Q59. What is the ecological importance of Semal tree?

Ans: It is the abode for vultures, which are natural scavengers and now considered as critically endangered species in Asian countries like India, Pakistan, Nepal, etc.

Q60. Which Country has banned the felling of Semal tree?

Ans: Government of Nepal has banned felling of Semal tree since 1999.

Q61. Is Semal a slow or fast growing tree?

Ans: Semal is a fast growing tree, attaining a height of about 30 mtrs & girth of 2-3mtrs in 50 yrs.

Q62. Why is Semal preferred for afforestation as well as deforestation?

Ans: Due to fast growth.

Q63. In which countries is Semal tree cultivated?

Ans: India, Nepal, Indonesia, Malaya, China, Hong Kong and Thailand.

Q64. In which literature is Semal referred to as 'hero tree'?

Ans: in Chinese Semal is called 'Ying Hung Shue' or 'hero' in view of its straight and tall trunk.

Q65. Is Semal tree an indicator of weather?

Ans: In the folklore of Hong Kong, it is believed that soon after Semal tree blooms the weather gets hotter.

Q67. What is the historical importance of Semal tree?

Ans: it is referred as 'Salmali' in Rigveda, whose wood was used to prepare chariots in view of its lightness.