A warm welcome.

To all my students.

Today we're going to study.

The topic on classical taxonomy and phylogeny.

The course code of my topic is BOC 105.

What I'm going to do today is Morphology, definition and

characteristics and functions.

The outline. Of my topic is definition of angiosperms

characteristics features of angiosperms

and morphology of Angiosperms.

What, you're going to learn at the end of this session?

-you're going to learn the definition of Angiosperms.

- you are going to study the general characteristics of

Angiosperms
- and you're going to understand the

unique features of angiosperms, along with definition and

uses of morphology.

Now I'm going to introduce to you this topic on angiosperms,

which is a very important topic.

Angiosperms or the seed plants or flowering plants.

They are largest highly diversified and the most successful group of

vegetation on Earth.

Till today, we have about 94% of the species of Angiosperms as

seen in 2017 by Royal botanical garden kew and about 96 percent of species in 2020.

You find that the angiosperms are the highest evolved plants on the

surface of the earth. And therefore they formed the

dominant group. You find them in every possible habitats

and climates. You find them in lakes you find them in

in forest or you find them as epiphytes.

Why are they the most diverse group?

They are diverse because of their adaptive specialization in

response to the great climate changes that take place. That

means they adapt to every climate and every possible.

Changes that take place. Therefore they are highly

elaborate in their vegetativeas well as floral features.

They may range from the smallest minute size

as a pinhead like how you see in the picture that is

Wolfia microscopica to extremely huge trees which

grow about 300 feet in height, like the giant

Sequoias. We have the picture at the extreme end. And

between we may have the grasses which are intermediates.

Depending upon the height. They may may be classified

as herbs, which are the smallest in height shrubs

the intermediate and we have the huge trees and those that

require support. We call them climbers.

Now what is the definition of Angiosperms? According to Eames

(1961) Angiosperms in Greek means vessel seeds.

That is, plant bearing seeds which are borne within the ovary.

And so the word Vessel seed. We define Angiosperms

as the group of flowering plants whose seeds are

enclosed within the carpel / ovary and stem bears vessels. When I

say vessels, it means Xylem and phloem. So when we define angiosperms

It is very important to take note that they are flowering

plants. Seeds enclosed in ovaries and stem bears vessels.

Now the root system consists of the root and its branches.

The shoot system has a stem, a system or branches and leaves.

Roots, stem and leaves together constitute the vegetative organs

of the plant body.

They do not take part in the process of reproduction.

The main points or the characteristics of Angiosperms

we are going to study today.

- the main plant is a Sporophyte

when I say sporophyte, it means it is

coming from the male and the female gamate, which forms into 2

N number. That is from the seed. We have the root, the

stamp and the leaves, so the whole plant is a sporophyte.

- second point, the flowering plants on maturity

produce Flowers. They produce fruits and seeds and all

These are the reproductive organs of the plant.

-The Third Point is that reproductive part of the angiosperm

sperm is a complex structure called as a flower. We know that

the whole plant is is a sporophyte, so the gametophyte

is inside into this flower, so it is a reproductive part, and

it is made up of the male and female reproductive organs.

The male reproductive organ is called the in androecium and it is

made up of stamens and stamens are made up of

filaments and anther.

Female reproductive organ is gynoecium It is made up of

carpel and carpel is made up of stigma, style and ovary.

-Now these show well developed vascular tissue. This is the 4th

point with Xylem with true

vessels. Vessels may be lscariform, Pitted, Annular and

Reticulate. Now vessels are tissues

 which help in conduction of water so they

conduct water from the tip of the root and supply to the

tip of the plant. So the like the pipelines which is

supplied at our homes. So there are tubes which are

consisting of thickened structures. Why?, because the

water conduction through these pipelines may cause

damage to them, so they are protected by these thickings.

Then we have the other type of vessels. We have, the phloem

phloem are conducting food material which is prepared from

the leaves to the different parts of the plant, so they're

not as stronger as that of

Xylem. And they are made up of Sieve tubes and they also

Sieve plates and they are supported by companion cells.

As you see in the picture. You can see the seat tubes.

-The fifth point is the ovules are always enclosed in an ovary.

The ovules turn into seeds and ovaries into fruit.

This is avery characteristics of the

definition of angiosperms, where we find the seeds are always

inside into the fruit. They're Not outside, so the seeds are

formed from ovules, which is a female reproductive organ. After

fertilization and the whole ovary becomes fruit. Therefore

you find seeds inside the fruit.

The main plant is heterosporous.What do we mean by the word

heterosporous? Hetero means different types

There are the two types of spores that are present here. These are

microspores or pollen grains. We

say male gametes and the second type are megaspores or

the female gamates.

The female gametes are present in the ovules and male

gametes in the pollen grains.

Pollination consists of transfer of pollens from

The anther to the stigma.

-The eight point is production of reduced

gametophyte, which is entirely parasitic on the sporophyte.

-The phenomena of double fertilization and triple Fusion

is a characteristic feature of angiosperms

 Now what do we mean by double fertilization?

Double fertilization involves a pollen and when it falls

onto the stigma, the pollen tube is formed an this pollen tube

will give rise to two gametes, so you will find 2 gametes that are

formed you can see in this picture, of these two

gametes. One will fertilize the female gamete i.e the egg

nuclei and the other one.

Will fuse with the polar nuclei. So Since, there are two

fertilizations, we call it as

double fertilization. And what is triple Fusion? In Triple Fusion

there are two polar cells which are in the

center, one male nuclei fuses with the polar

nuclei and forms the triple fusion.

And since there are three cells which are

involved, we call it as triple Fusion.

As a result of Fusion of the other male nuclei, we get the

zygote or the small baby, that is formed from this plant.

As a result of triple Fusion. We get what is endosperm? So the triple

Fusion is also a characteristic feature.

So you can see here the embryo surrounded by endosperm.

Which helped in nutrition to the.

And growing embryo.

What are the unique features ?

you have already studied the characters so we will see.

the unique ones

-Ovules enclosed in an ovary.

-Presence of two vessels that is

Xylem and sieve tubes and companion cells in phloem.

-Presence of a complex reproductive structure the

flower.

-Occurrence of double fertilization and triple Fusion.

-And the presence of reduced male and female gamete which is only

in the form of pollen grain and ovule, which is growing on to

the sporophyte. And finally, the germination of pollen grains on

stigma. These are the six very important unique features of

Angiosperms.

Now, briefly, I'm Going to tell you about the

morphology, because in the following units you will be

studying about morphology.

An in detail about all these morphological structures

.Morphology is a branch of

biology that deals with form, size and structure, or various

organs of the living Organism.

So we know that each and every living Organism has a definite

form. So when I say morphology, it means study of the external

structure of the morphology,external feature, how one

person is different from the other, can be known from the

external morphology. Same wayone plant or one part of the

plant to the next one. Now what is the function of morphology?

It helps us to identify, distinguish

living organisms so you can identify one from the

other on the basis of morphology. Also it

helps in other fields such as genetics, genetic

engineering, horticulture,crop protection, etc.

therefore you will be studying in the following units

in detail about the modifications and functions of

different parts of the plant. We Know the different parts of the

plant, are roots, Stem, leaves, Flowers and fruits, so they are

modified, or they may not be the same in all the plants. You will

find them doing the function of storage of food for mechanical

support or respiration in case of roots. Stem may modify for storage

Of food , for vegetative propagation and protection. leaves

may be modified for photosynthesis. Sometimes it is

modified into tendrils.

Or spines or may show marked variation in shape. The margin

may be different.The apex of the tip may be

different than the lamina.

The flower may be modified for reproduction and show different

types of sepals, petales ovule rarrangement and different

inflorescence. An fruit varies in shape, size,

structure, and viability.

So these are the things which will be studying in

detail in the next module.

The references for this we can refer to Pandey.

And there are two references. You can see the

references .

thank you.