Hello students, unit one

meristematic and permanent issues.

Module name complex tissue

Phloem module number 07 myself.

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Outline components of phloem tissue

structure of phloem tissue components.

Learning outcome students will be able to

describe the components of phloem tissue,

recognize its characteristic,

analyze the functions,

differentiate between the elements.

We have already seen in module #3 that

the permanent issues can be subdivided

into simple tissue and complex tissue.

We have the complex tissue that

is made up of more than one

type of cells and further it is

subdivided into Xylem and phloem.

Xylem is involved in conduction

of water and phloem is involved

in conduction of food.

Now Phloem word is derived from a Greek

word Phlois mean bark because bark

is mainly composed of the secondary

phloem and it is coined by Nageli.

Not when you study phloem,

you will come across primary phloem

and you will see secondary phloem.

The primary phloem is derived from

Pro meristem and secondary phloem is

derived from the vascular cambium.

This is the vascular cambium and the cells.

Over here are the secondary phloem

which are derived from the cambium.

Now, based on the formation you have

the two types you have the proto phloem

and you have the meta phloem. Now.

Proto Phloem will be composed of smaller.

cells and it will be formed first.

You can see over here these are smaller.

An meta phloem will be formed later and

they will be consisting of larger cells.

So this is the meta phloem.

This is the proto phloem.

There are four main components of phloem.

You have seen elements,

companion cells, phloem parenchyma

and phloem fibers that you can

see in the longitudinal section of phloem

and the transverse section of phloem.

Now, Sieve element will be

mainly composed of two types.

It will be Sieve cell and sievetube.

Sieve cell is the primitive conducting

tissue because it is present in lower plants.

That is basically in case of

gymnosperm the cells will appear

elongated and they will be narrow.

Then you have this Sieve tube

elements which are advanced type.

These are the actual conducting cells.

In case of the phloem tissue they

will be short elongated cylindrical

tube like structures.

And each of these sieve cell will

be forming a continuous channel

that is called Sieve tube.

2nd is YouTube elements which

are advanced an are the actual

conducting cells in the phloem,

they're short,

elongated cylindrical tube like structure

which are forming the long tubes.

The end walls will be showing you the

presence of this you pores and this you

pores are the modified plasmodesmata.

Now, we have the types of sieve

plates based on the sieve pores.

This is the longitudinal section that is

showing the presence of sieve plates.

Now the sieve plates can be simple.

when it is having a single sieve area.

Plate with several sieve areas will be

referred to as compounds plate.

When there will be several sieve

areas with the sieve pores.

Now,

here you can see this sieve tube element

with the companion cell and a sieve

plate each of those sieve plate will be

having the presence of the seapores.

Now when you study it in detail,

you will see to it that this is the

end wall that is showing you the

presence of two primary walls of

two different cells and you will

also see the presence of the middle

lamellae and these two cells will be

interconnected by the connecting strand

and the connecting strand will be

encapsulated by a layer of callose.

And you will see the presence

of the pores in these areas.

Now mature, Sieve tube will contain.

Parietal cytoplasm a central vacuole.

A large group of longitudinally

running transcellular proteins.

Now these proteins are referred

to as the phloem protein.

There is no presence of nucleus.

The nucleus of the adjacent

cell that is the companion cell

controls the activity of the suit.

This is the difference between

the sieve cell and the sieve tube.

Here you can see that it is

one of the primitive type.

This is the advanced tab.

This is having the elongated cell whereas

this is forming or tubular structure.

Secondly this will be showing you

the presence of albuminius cell

whereas this will be showing you

the presence of the companion cell

that lie adjacent to this sieve tube.

Companion cell,

this is a characteristic feature

of angiosperm and they are closely

associated with the sieve tube.

The sieve tube and the companion cell will

be interconnected by means of plasmodesmata.

Each of the companion cell will be leaving

elongated and it will be thin walled.

It will be having dense cytoplasm

and a prominent nucleus.

They will be showing you the presence

of large ribosomes and mitochondria.

They're going to provide the energy that

is required for translocation of the

food materials in the sieve tube members.

Here you can see the L.S. of the

phloem and the companion cell,

and here you can see the transverse

section of the sieve tube.

And companion cells.

Which are connected by plasmodesmata.

Not in this particular section.

You can see that the sieve tubes

will always show the presence of the

companion cells adjacent to them.

Next component of phloem is

phloem parenchyma.

The cells will be elongated and

Will be made up of cellulose and they will

be showing you the presence of pits.

They have the dense cytoplasm and nucleus.

They are helping in storage and radial

conduction. Now in case of secondary

phloem you will have the phloem parenchyma,

which are arranged vertically along

the sieve tubes and you have the Ray

parenchyma which are arranged

in the horizontal direction.

The last component of phloem

is phloem fibers,

which are also referred to as bast fibers.

They are mainly found in abundance.

In secondary phloem,

the cells are elongated,

unbranched with the tapering ends,

and they're dead.

They're offering mechanical support

and protection to the phloem tissue.

These are few of the references books

and the websites for your reading.

Thank you.