Hello students, myself Miss Prachi Vernekar, assistant professor, Government College of Arts, Science and Commerce, Sanquelim Goa.

The name of the module is Vegetative and Asexual reproduction in *Pteris*.

In this module we will be studying about vegetative and Asexual reproduction of *Pteris*.

At the end of the module you will be able to explain the vegetative and Asexual reproduction in *Pteris*.
You will be able to describe the structure of sporangium in *Pteris*.
You will also be able to explain the process process of dehiscence of sporangium and dispersal of spores in *Pteris.*

Moving on to the first one that is vegetative reproduction, vegetative reproduction in *Pteris* usually takes place by means of fragmentation.

The older parts of the rhizome rot and rotting reaches a dichotomy or branching regions, the two branches separates and carries on growth as separate plants.

The next type of reproduction is asexual reproduction in *Pteris*.
Takes place by means of spores formation. It is homosporous plant which bears only one type of spore, and is produced in a sac like structure called as sporangia.
The sporangia form continuous sorus known as **Coenosorus**.
Coenosorus are borne on margins connecting veins of fertile pinnules and is protected by upper false indusium formed by the incurved margin of the pinnae.
Sorus is of mixed type. Sterile hairs are present in between the sporangia

This is the diagram of structure of leaf passing through sorus, in which we can see the different developmental stages of different sporangia and sterile hairs also are present.

Moving on to the next that is structure of sporangium.
Sporangium is made up of a stalk or pedicel and capsule or body.
As you can see in the diagram, the lower portion is denoted as stalk and the upper Oval portion is the capsule of the sporangium.
Let us talk about stalk. It is a long, slender, multicellular and three celled in height. It bears water gland.

Next is the capsule or the body.

It is oval and of biconvex shape. The sporangial wall or jacket is single layered and modified to form annulus and stomium.

Let us talk in detail about the Annulus.
It is vertical row of 16 thick walled large cells, which forms an incomplete ring around the sporangium and covers 2/3rd of the capsule.
As you can see in the diagram, the two third portion of the capsule is covered by Annulus,
The annulus has thick inner tangential and radial walls, and thin outer and sidewalls.
It becomes hygroscopic in mature sporangium.
when the annulus matures it has the ability to absorb moisture.

The next is Stomium
It is small group of long, flat and thin walled cells immediately below the annulus in remaining 1/3rd of the capsule on one side.
On side as you can see it in the diagram.
Two narrow and radially elongated cells are present in stomium region and are called the lip cells.

The next is Dehiscence of sporangium.
It occurs in dry weather. At maturity, both annulus and stomium brings about the dehiscence of sporangium and dispersal of spores.
The annulus acts as a spring and the Stomium acts as a point for easy cleavage. The dispersal of spores takes place in two stages.
In the first stage the sporangium breaks open the stomium.
The mature dry sporangium loose water throughout its surface. This causes inward contraction of annulus in outer walls.
This results in rupture of sporangium or a split along the cells of stomium.
The annulus slowly straightens out and gradually bends backwards as attached with axis.
This is seen in the diagram very clearly.
The annulus carries upper half of capsule containing the exposed spores. The total number of spores varies from 30 to 64,

In the second stage the annulus works like a spring, which returns to its original position after throwing out the spores with a jerk into the air forcibly.
In the diagram shown, you can see that after dispersal of the spore, the annulus retains or gains back its original shape and looks similar to that of the matures sporangium.

The next is the structure of spore.
The spores are tetrahedral in shape. The spore wall is two layered
The first is the exine and the other is the intine.
The exine is called as exosporium. Exine is actually the outermost thick walled structure which is smooth and brown coloured.
Intine is also called as Endosporium and it is the innermost thin layered structure.

The next is the germination of the spore.
The spores germinate depending on environmental conditions.
It germinates to produce the prothallus under favourable condition.
The intine emerges out in the form of a small germ tube along with enclosed contents on rupturing of exine in the beginning of germination.
Further, it undergoes several divisions to form a new prothallus.

This is the diagram of a new prothallus which is formed.
The prothallus is monoecious, because it is developed from the homospore. When the prothallus matures it bears antheridia which is the male sex organs, usually embedded in between the rhizoids.
This is the antheridia are usually located in the posterior region.
The next is the archegonia that is the female sex organ which is present just below the apical notch in case of the prothallus of *Pteris*.

These are the references which I have used for the module.