

Hello dear students.

My name is Dr Sapna Gaitonde I'm from Government College of Arts, Science and Commerce, Khandola and today we are going to take up Unit 2 which is microbial interactions in that

The module name is micro plant interactions part one. It's a module number 14. So let us begin now what all you are going to learn in this module is positive interactions of plants and microbes. The importance of these interactions. And Symbiotic associations between the plants and the microbes.

At the end of this module, the student will be able to learn and explain the plant microbe interactions, cite examples of synergistic interactions, and describe the concept of rhizo deposition. So let us begin. Microbes are ubiquitous in nature, and they establish Interrelationships with plants, animals, and many other living organisms. So today in this module will be discussing about their relationship with the plants. Now these interactions can be positive or negative innature. For example, we can have symbiotic relationship which are positive associative relationship which are again positive, whereas the pathogenic

relationships are the negative relationships. Plants are known to secrete various organic compounds. Which resulted nutritionally and rich environment. Because of which they can establish synergistic interactions. So let us see the synergistic interactions between the plants and the micro. The First one is Spermosphere.

The waters for most feel.

It's the volume of the soil that surrounds a seed.

That means the organisms which form the normal flora around a Germinating seed, they have beneficial effects on that particular seed. So when a seed is sown in the soil, these interactions of the seed borne microorganisms and the soil borne microorganisms play a very very important role.

In the crowd and also the suppression of the pathogens.

2nd is the rhizosphere.

Rhizosphere is a region where the soil and the the roots of the plants make contact with each other.

The roots of the plant are known to act to secret route accidents because of which they help the other organisms in the rhizosphere rich.

The third is the phyllosphere.

What is the phyllosphere? The Interrelationship between the plant foliage and the microbes on the surface field.

Like the roots, leaves also secrete exudates.

Which promote or deter the growth of the organisms which are present on their surface.

Any change in this microflora or phyllosphere will affect the physiological activity of the roots.

Lastly, epiphytes water epiphyte. These are the microbes that colonize the plant surface.

And unknown to synthesize into acidic acid.

Now let us move to the next slide. You can see a beautiful diagram over here which depicts the phenomena of rhizodeposition.

What exactly is rhizodeposition?

Sunlight and carbon dioxide are absorbed by the leaves of the plants. And they converted into a fixed carbon source.

This fixed carbon now travels down the plant through the roots into the soil and the microbes will start picking up these exudates and the organic compounds that are secreted for their own

growth and benefit.

In return, the microbes attach to the plant root, where it will

improve the root access to the

nutrients. So this is rhizodeposition. There are many

beneficial interactions that happen between the

microorganisms and the plants.

These beneficial interactions are named as symbiosis.

In the earlier models, you must have studied that symbiosis

basically is the phenomena of

living together. Where both the partners are benefited.

So we'll discuss some of these beneficial interactions over

here. The first one is cyanobacteria symbiosis.

What happens in cyanobacteria symbiosis

that is cyanobacteria which is involved over

here like *Anabaena*?

And there are two forms of this.

These forms are basically consisting of the heterocyst. In

case of heterocyst had true cyst is a site of nitrogen

fixation. So *Anabaena* the example *Anabaena*, which is

that is associated with the roots of *Cyperus* blood.

Let's move onto the second symbiotic relationship that is

spechty real symbiosis.

Now, this is basically responsible for nitrogen

fixation.

In this you have the symbiotic

nitrogen relationship. With the help of symbiotic nitrogen

fixers like Rhizobium.

And even the free living bacteria like Azospillum can

do this particular nitrogen fixation. Next beneficial

interaction is PGP. PGP are our plant growth promoting rice or

bacteria. They are present in the rhizosphere of the roots.

They are known to colonize the root in the rhizosphere region.

They help in the growth of the

plants. Also they control the

pathogen attack. And they produce growth hormones and

vitamins. Some of the bacteria that belong to this

group belong to the genera of Pseudomonas basillis,

beneficial interaction is actinomyces

eat non legume symbiosis.

Frankie is a very common and popular example.

Frankie's species over here is known to develop the nodules.

In the non leguminous plants, and these are

called Actinorizer.

The non legumes may belong to the speeches of Anas or

Myristica and many more.

The next and the last beneficial interaction is fungal symbiosis.

Fungal symbiosis is the plant and the fungus

interaction and Association.

These are commonly known as mycorrhiza. Mycorrhiza can be

of two forms. The Ectotrophic and Endotrophic.

So with this we come to the end of this particular module.

These are the references which I would like all of you

to go through and read more about these type of

interactions between the plant and the mycorrhizas.

Thank you.