

Hello friends, we are dealing with
paper plant ecology and phytogeography.

In this module we will be learning about
habitat and niche, ecotone and edge effect. In the
previous few modules you have studied
about different aspects of community,
its characteristics.

And different aspects like density,
frequency abandons all that. you have studied.

The broad outline is here.

Habitat and niche,
then ecotone and edge effect and at
the end of this module you will be
able to recall the terms habitat, niche,
ecotone, edge effect and also you
will be able to describe the terms
habitat, niche, ecotone and edge effect.

First, we will see habitat.

So, all of you know what is habitat?

Habitat is the place where an
organism or species population lives.

So many different types of organisms will live in particular area.

For example,

you take a part a pond is a habitat for different phytoplanktons.

If you take a grassland,

it will be a habitat for so

many different types of grazing animals,

including rabbit.

Habitat can be

divided into three types terrestrial, aquatic and

aerial type of habitat and a

habitat may have one or more smaller habitat.

There will be a large forest and there

you will find smaller different habitats,

so, such smaller habitats are called

micro habitat.

Now we will come to the niche: The term niche

is given for the first time

by a geologist called Joseph Grinnel.

He gave this term In the paper he published about birds

of the California and According to him

he considered this to be a subdivision
of habitat and as a distributional unit,
and this niche emphasize more on
occupational state of its species.

It will emphasize more on such as the
different activities which will be
taking place in the surrounding by
themselves, that is, collection of food,
nesting, interaction with other species.

And also climatic condition they
will interact with that.

Another great geologist G. F. Gause; he said
that no two species with same ecological
niche requirement can coexist.

That is, for example,
you have two species which want
same type of food,
same type of surrounding etc.

So then they two cannot coexist
at one place. Either one have to move away from that place
or that may be extinct or that may be

replaced by the dominant species there.

This niche and habitat are

two different aspects.

Habitat refers to the place

where an organism lives and niche

to the activity of organism.

For example,

A pond is a habitat for many plants as well

as many animals,

and if you carefully observe,

most of the phytoplanktons will be

seen at the surface level and zooplanktons will be at different depths.

Some of them will be at the bottom,

some at shallow water zone.

Some may be at top or surface level.

That is,

depending upon the food, habitat,

they may be feeding on phytoplanktons occurring at different levels.

Similarly, the hydrophytes, you will

find so many different types of plants

in a pond or lake and all of them

will be not grouped at one place.

Some will be seen free floating,

some may be seen submerged in water

and some of them may be emergent.

That means they will be having a

strongly attached root in the mud.

And partially emergent from the

water surface, see this image.

This is one example.

In this image you will find this is

a pond ecosystem where you can see

there are different types of plants.

Not many, but you can see free floating.

Some small plants are rooted but with floating leaves.

Then you will find emergents.

Some grass and sedges

are emerging out of the water.

Like this you will find variation

and you can very clearly

make out that all the plants

are not grouped at one place.

They are dispersed and they have different strata or substratum where, they are attached and they are trying to survive and compete with each other.

Niche can

be divided into three types.

That is, one is Spatial or habitat niche,

then second is the Tropical niche

and third one is Hypervolume.

So first we will see the

Spatial or habitat niche.

This is concerned with the physical space.

That is spatial means physical space

occupied by an Organism.

Different species may occupy

the same habitat,

but you will find the activity of

each species may be actually confined

to a smaller place, smaller habitat.

You can say the smaller habitat

As the micro habitat.

For example,

you take litter decomposing fungi.

You will find there will be a thick

layer of litter in the ground layer

of forests and at the different

level of this litter you will find

different species of fungi which

will be degrading the litter.

Same way,

you may find different types of insects

worms which will be their feeding on litter or different organisms at different levels.

In turn they will be decomposing the litter.

Not all the organisms will be there at one level.

Then come to.

Trophic niche: This type is

referring to the trophic position of

an Organism that may be different

bird species in the forest habitat,

but their feeding habit will be

different like some will be feeding

on nectar, some on fruits, some on fallen seeds and some may be feeding on flies and insects.

Accordingly, you will find them distributed at different strata of the forest.

Some at the ground level, some maybe at the understory level.

Some may be at the canopy level, like that you will find distribution.

That means they are at different trophic levels.

Third one is the Hypervolume niche or Multi-dimensional niche and this type, developed by Hutchinson in 1965.

He recognized the two subtypes.

That is Fundamental niche.

According to him it is the maximum abstract inhabited hypervolume.

When the species is not competing with others for its resources,

hypervolume is an area which you can define by more than three dimensions.

So it is not just two

dimensional area volume like that.

It is the hypervolume and you will find

in the figure there are two species A&B.

And they are having separate niche.

So there is no overlapping among them.

And then that's why you will not find any

kind of competition among themselves.

The second subtype is Realized niche.

In this, you will find an individual

or species normally remains in

competition with other organisms.

So, you will find here only a

part of the niche is realized.

That is,

there will be lot of competition

among the two species in this

overlapping zone and no competition in the remaining non-overlapping area.

And that the area where you will find

a lot of competition that is called

realized niche.

Now come to Ecotone and

edge effect: Each

community has its spatial limits.

They can survive in particular area very well.

So the boundary between two community

may be very sharp like you will find in

between a forest and a lake.

There will be no different strata,

all of a sudden the lake will start

Then in case of grasslands you

will find that there will be gradual

transition that is from grassland to

Forest,

So the change from a grassland to a forest is

not all of a sudden.

Here, this transition zone

between two or more diverse

communities is called ecotone.

Now come to edge effect:

Ecotone harbours a community,

including organisms of each of

the overlapping communities.

That is,

it will have the community of the two.

Adjacent landscape as well as

it will have another type that

is different from the two.

That is the one edge which is

created by joining of the two.

Adjacent ecosystems and usually

this area will have much more

or greater diversity compared

to the two edges.

So what you will find there

will be diversity between.

That is the diversity of the one landscape,

then another landscape and also

in addition to that you will

find more and more species

in the junction between the two.

So occurrence of these increased

diversity and density of Organism

at the ecotone is.

due to a kind of effect that

is called the edge effect,

So you will find more

diversity in this edge.

For example.

Best example is Shola forest.

In this you will find it is a combination

of grasslands and forest and you will find

so much diversity in this type of forest.

You may not find in any other type of forest.

This is another example,

you will find all of a sudden,

there is no much difference

sharp transition from

one form to another that is a

river or stream and a cropland,

So you can't make out the

edge effect much here.

Maybe a small line.

You may find different type of

vegetation in the adjoining area,

So to sum up, we have studied habitat.

We have studied different

types of niche then what is

ecotone as well as

the edge effect and here are

some of the references.

for further reading you can refer

this for little bit more information,

Thank you.