The module parasitoids.

Is part of Unit 1.

It includes the following points.

Definition of parasitoids.

Comparison with true parasites and predators.

Explanation of the mode of

operation of the Emerald wasp

as an example of a parasitoid.

Characteristics of parasitoids,

types of parasitoids,

importance of parasitoids and

hyper parasitoids.

At the end of this module the learner describes

a parasitoid ,understands the

similarities and differences with

reference to parasites and predators,

explains the classification of parasitoids,

understands the importance of

parasitoids and hyperparasitoids.

Parasitoids are organisms whose young

develop on or within another organism,

which is the host eventually killing it.

It spends a major part of its life

cycle  within another organism,

in a parasitic relationship.

However, unlike a true parasite,

it always ultimately kills the host.

They do resemble predators in this,

but they are different in only

requiring a single host individual.

Unlike predators that immediately

kill the prey,

host attacked by parasitoids die more slowly.

Some hosts are paralyzed,

others continue to feed or

even lay eggs before they die.

Some of the examples of parasitoids

include species of Wasps,

Tachinid flies,

beetles ,worms,

for example,

the Gordian worms.

One  interesting example,

is the Emerald Wasp or Ampulex compressa

Now this is a parasitoid of the

household cockroach Periplaneta americana.

The female wasp chases the

cockroach and stings it twice.

The first sting is to the thorax.

It temporarily paralyzes the front two legs.

The second sting directly to the cerebral

ganglion robs the cockroach of its

ability to initiate its own movement,

like walking.

Now the wasp will lead the cockroach

by its antenna to the wasp nest.

And the cockroach docilely follows the wasp.

The wasp now lays an egg on

the abdomen of the cockroach.

This egg hatches into a larva

after around four days.

And ultimately it will chew its way

into the abdomen of the cockroach.

This larva now starts eating the

internal organs of the cockroach,

but in a very precise order.

It starts with the non vital organs.

This ensures that the docile victim

stays alive for the next four days

till the lava forms a cocoon inside.

Even as it is being eaten

alive from the inside,

this cockroach shows no

desire to struggle or flee..

It behaves literally like a zombie.

Now the full grown wasp emerges from the host.

So coming to some characteristics

of parasitoids.

We see that it is only the female which

searches for the host to lay the eggs.

And the eggs are laid in or near the host.

The adults are free living and

it is the immature stages that

are the lethal ones -they feed

directly on and kill the host.

The young parasitoids feed on the non

vital tissues as we mentioned earlier,

first so that the host is not

immediately killed and it is kept

alive till its purpose is served.

Now Parasitoids can be classified based on

the kind of effect it has on the host.

We have two types,

Idiobiont and  koinobiont

Now the idiobiont  is where the

host is paralyzed and prevented from

moving or growing .
In koinobiont,

on the other hand,

the host is allowed to continue to

grow and develop.

Based on the number

of immature individuals per host,

We have a solitary parasitoid,

or gregarious parasitoid.

A solitary parasitoid is a single

parasite developing within a single host.

Example, Ichneumonidae .

The Gregarious parasitoid on the other hand,

have many larvae developing

within a single host.

For example Braconidae.

Based on the stage of the host that is attacked,

we have egg parasitoids means

these parasitoids attack the egg.

Examples are Trichogramma and Telenomus wasps.

Larval parasitoids are those

which attack thelarvall stage of the host.

For example, Netalia Producta

Tachinid flies ,Cotesia wasps.

Pupal parasitoids attack the pupal stage

example is Ichneumon promissorius.

And we also have the larval- pupal parasitoids.

The example of this is Heteropelma scaposum--

here it lays eggs in the host caterpillar,

but the adult wasp,that is, the parasitoid emerges only

after the caterpillar has pupated.

Let's discuss the importance of parasitoids.

Now these are very effective

agents for biocontrol of pests, their host

specificity is of great help.

They have great ability to locate the hosts,

and they do so even when the

host density is very low.

So there is a group of very interesting

organisms called hyper parasitoids.

Now,Parasitoids can be

parasitized by other parasitoids.

So these are called as the hyper parasitoids.

An example is Hypopteromalous tabacum

This wasp is a hyper parasitoid,

that injects its eggs into

Cotesia congregata

which is another wasp,cocoons

so it injects its eggs

into this Wasp’s cocoons,after they have emerged from

hornworm caterpillars. So Hypopteromalus tabacum is a hyper parasitoid on the

Cotesia which is a parasitoid of the hornworm caterpillars.

But when hyperparasitoids,

target beneficial parasitoids,

they are detrimental to natural pest control,

so that is a problem.

These are certain references to go through.

Thank you.