Hello students. This module is a

part of Unit 5 parasitic arthropoda.

The module name is biology of ticks.

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The module comprises of introduction

to ticks, morphology of ticks,

life stages of ticks and their feeding.

By the end of the module,

students will be able to describe

the morphology of tick and

elaborate the life stages of tick.

Ticks are the most significant blood

sucking arthropods worldwide.

These are an ancient group of obligate

bloodsucking ectoparasites that

have evolved over millions of years.

Vectors of various pathogens to humans.

Domesticated animals and wildlife.

These Arachnids are of two types on the

basis of the difference in their body proper.

There are Argasid ticks and Ixodid ticks. Argasid Ticks are also known as soft ticks

belonging to the family Argasidae,

whereas ixodid ticks are also known as hard

ticks and belong to the family ixodidae.

This slide shows a hard tick and

a soft tick on the left hand side.

There is a ixodid tick and on the right

hand side there's a argasid tick.

Ticks are parasitic arachnids

belonging to subclass Acari.

They are distinguished from other arachnids

by possession of a distinct Gnathosoma,

an anterior capitulum bearing mouthparts,

and by the absence of a recognizable division

between the cephalothorax and the abdomen.

Usually in other arthropods

there is a very good,

recognizable division between the

cephalothorax and the abdomen,

at least in the arachnids,

it is present,

but in this arachnids it is absent.

Ticks are hematophagic, that is blood

sucking parasites larger than

mites with leathery skin and most

tick species have a long lifespan,

which maybe five years or more.

They also have a very high reproductive

potential with some species depositing

more than 18,000 eggs at a time.

The body of tick is segmented

and divisible into two regions.

That is,

the gnathosoma and the Idiosoma. Gnathosoma is the head region of the Tick,

whereas the Idiosoma is the body proper.

Gnathosoma bears the capitulum, which bears the mouthparts,

and Idiosoma contains the legs,

digestive tract and reproductive

organs of a tick.

The capitulum is movable with a

rostrum which encloses pair of toothed

chelicerae and toothed hypostome,

which are the mouthparts of the tick,

and these both together help to

anchor the tick to the host and

also it consists of a pair of pedipalps arising from the antero ventral

margin of the body.

This picture shows a clear distinction between

the Gnathosoma and the Idiosoma.

The chelicerae are appendages specialized

for cutting and piercing into the host skin,

whereas the Pedipalps are leg like

appendages that are sensory in function.

The larger mites usually closely

resemble the ticks,

but there is a difference between this

that the mites are smaller with unarmed,

hidden hypostome, whereas ticks are larger

with exposed hypostome armed with

teeth or hooks as shown in the picture.

The larvae of ticks have

three pairs of walking legs.

That is 6 legs, whereas the nymphs and

adults have four pairs of prominent

slender legs with two claws and paired.

The legs bear some sensory or tactile hairs

and also an unique sensory structure known

as Haller’s organ on the tarsus of the leg.

This Haller’s organ is used to detect odors,

chemicals and infrared light emanating

from the host and also to sense

temperature and air current variations.

In a stationary position,

the legs of a tick remain

tightly folded against the body.

The tegument,

also known as the exoskeleton of the tick,

consist of an outer cuticle and a single

layer of epithelial cells that secrete it.

The cuticle, maybe membranous or leathery,

and often has hard plates or sheets.

Now, depending on the type

of cuticle that is present,

there is a distinguishing character

between the hard ticks and a soft tick.

Hard ticks have a hard upper surface

called as shield or scutum that

covers the entire back of the male,

but it only partly covers the female

and the mouthparts are visible of

a hard tick from a dorsal side.

Soft ticks do not possess such shield,

so the sexes often look alike,

with the mouthparts beneath

the anterior end of the body,

which are not visible from the dorsal side.

Most ticks appear brown or

reddish brown in color,

but some species have distinctive

white patterns on the scutum.

The life cycle of a tick proceeds

in four stages, namely eggs,

larvae, nymphs and adults.

Engorged females, engorged means

totally filled with blood.

Who has finished feeding on the host.

Such females lays eggs off the

host body which hatch into six legged

larva that molds into eight legged,

nymph and adult.

The eggs are often oviposited as

masses on the grounds or in the

cracks and crevices or Burrows

in the walls or in the fields.

Larvae are six legged and

thousands of such larvae,

commonly known as seed ticks.

Hatch from the egg batch and crawl

randomly in search of a host,

and they acquire two legs, two extra legs.

That is by molting and acquire other two

lakes by molting into the nymph

stage only after a blood meal.

So they have to have a blood

meal to moult into the next stage

of their life cycle.

During feeding,

the host wanders and the tick is

transported to a new location

where when engorged it drops off.

The nymphal stage consists of

seven nymphal stages of ticks.

After molting from the larval stage,

the nymphs develop, which climb grass,

leaves or plant stems and away to host.

Because they are higher

than the ground level,

they often tend to attach or larger host.

Then before and each of the seven nymphal

stages require a blood meal obligatory

to moult after several days of feeding,

they drop off and again moult.

These are ticks sometimes.

Wait for months or more than a year.

For a suitable host,

then finally engorged after feeding,

they drop off to oviposit ticks that

tend to feed on the same host species

at each stage of their life cycle

are referred to as one host ticks,

whereas there are some types

of ticks that have a multi host

lifecycle which may be referred

to as two or three host ticks.

This picture shows life stages of ticks.

This are the eggs, which are the masses of

eggs that are laid,

are often larger than this.

The larvae,

known as she picks these are the

names and these two other end cost

form of the nymphs and here you can

see sexual dimorphism is a hard tick

so you can see a sexual dimorphism

between the female and the male

and this is a engorged female.

ticks seek their host by climbing

vegetation and awaiting vibrations or

shadows to announce the arrival of a host.

By a process known as questing,

the first pair of legs is

extended to grasp the host.

when a contact is made maybe when the

host is wading through the grass.

Is such kind of contact is often made.

They detect heat or carbon dioxide

that is released by the host and

climb onto the host as it passes.

During feeding the chelicerae or

the teeth are used to cut the host

skin and then the hypostome that’s

the feeding tube with a curved

teeth is inserted inside the skin.

There are many rows of recurved

barbs on the hypostome that

becomes cemented in and anchor.

The tick to its host,

making it very hard to withdraw

the tick by external force.

The blood is pumped by a muscular

pharynx and the salivary glands

produce an anticoagulant that allows

long periods of feeding on the host

without the host blood coagulating,

the tick usually moves to highest

part of the host to attach and

feed on the head or ears.

These are my references, thank you.