

Mites and their manifestations



**MEDICAL ACADEMY NAMED BY SI GEORGIEVSKIY
CFU NAMED BY V.I.VERANDSKIY**

DEPARTMENT OF MEDICAL BIOLOGY

- **1st course**
- **Satyam rawat**
Group 192 b
- **Mam Svetlana smirnova bright**

MITES (Acari)

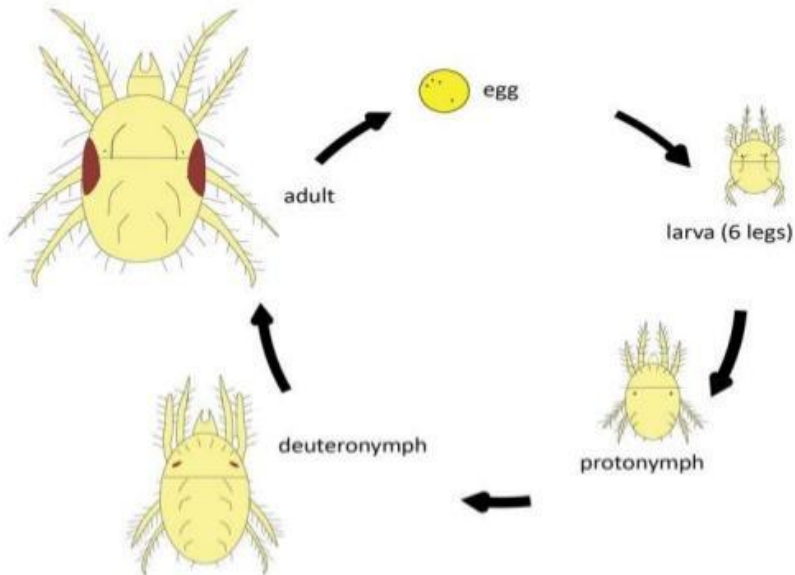
- Free-living
- Predacious
- Parasitic (endo/ecto)
- How can they be distinguished from ticks?



General Life Cycle

- Egg
- Prelarva
- Hexopod larvae
 - May or may not feed.
- Nymph
 - May or may not feed.
 - Protonymph, Deutonymph, Tritonymph
- Adult
 - May take one or several meals.

- Mites are among one of the most diverse and successful of all invertebrate groups.
- They are small in size and often go unnoticed.
- They cause loss to stored product.
- Also cause damage to beneficial insect like honeybee.
- Life cycle consist of egg, larvae, protonymph, deuteronymoh, & adult



Characterstics

- They found in variety of habitat
 - Aquatic – Lakes or pond
 - Terrestrial- Plant, Mammals, Birds and insects or they live freely.
- Body is divided in 2 regions –
 - Cephalothorax
 - Abdomen
- 4 pair of legs
- Sucking mouth parts
- Lack of antennae & wings.

Tetranychidae

Spider mites

- Body color is red, green, yellow, brown etc. and size 0.2-0.8 mm long. Body is flat, oval.
- Chelicerae are fused to form a stylopore and the movable segment of chelicerae forms a flagellate stylet.
- There is no mitotic division in larval stage.
- Most of the species are having narrow host range.
- Thumb claws are present.

Damage

- Prefer to live on underside of leaves, later spread on whole leaf.
- Moderate pop. Reduce the yield while severe infestation could kill the entire plant.

Other sp. that cause damage

1. *T. neocaledonicus* - brinjal
2. *Eutetranychus orientalis*
3. *Eutetranychus hirsti*- Fig
4. *Paronychus citri*
5. *Oligonychus indicus*- Sorghum
6. *O. coffeae*

Tarsonemidae Broad mites

1. Body is elliptical and body measures 0.1-0.3 mm long.
2. Body is divided into three parts Capitulum, Propodosoma and Prohysterosoma (the later two parts together known as Idiosoma).
3. Mouth parts are contained in a distinct capsular head known as Capitulum.
4. Females are bigger than males and body colour is opaque white light green or pinkish.
5. Adult integument is hard and shiny.
6. Few hairs, spines are present on body.
7. Chelicerae are needle like.

Palyphagotarsonymus latus

- **Yellow mite** in chilli
- It also attack tea and potato
- Infested leaves show crinkling and curling effect
- Defoliation



Stenotarsonemus spinki

- Paddy panicle mite



Tenuipalpidae (false spider mites)

- Three types of setae namely hysterosal, dorsoventral and mediolateral are present.
- The true tarsal claw is hooked or pad like and with tenant hairs
- Citrus flat mite- *Brevipalpus lewisi*
- *Brevipalpus californicus*- It causes serious injury to a wide variety of Ornamental and agricultural crops

Eriophyidae (Blister, rust, gall mites)

1. Body is minute measuring 0.08-0.2 mm long and body is segmented
2. Body is 2 types:
 - a) Elongate vermiform, worm like, soft body
 - b) Wedge shaped, hard body
3. Body is divided into cephalothorax and tapering abdomen.
4. Abdomen is finely striated with long setae.
5. Two pairs of legs on anterior end of body in all the life stages



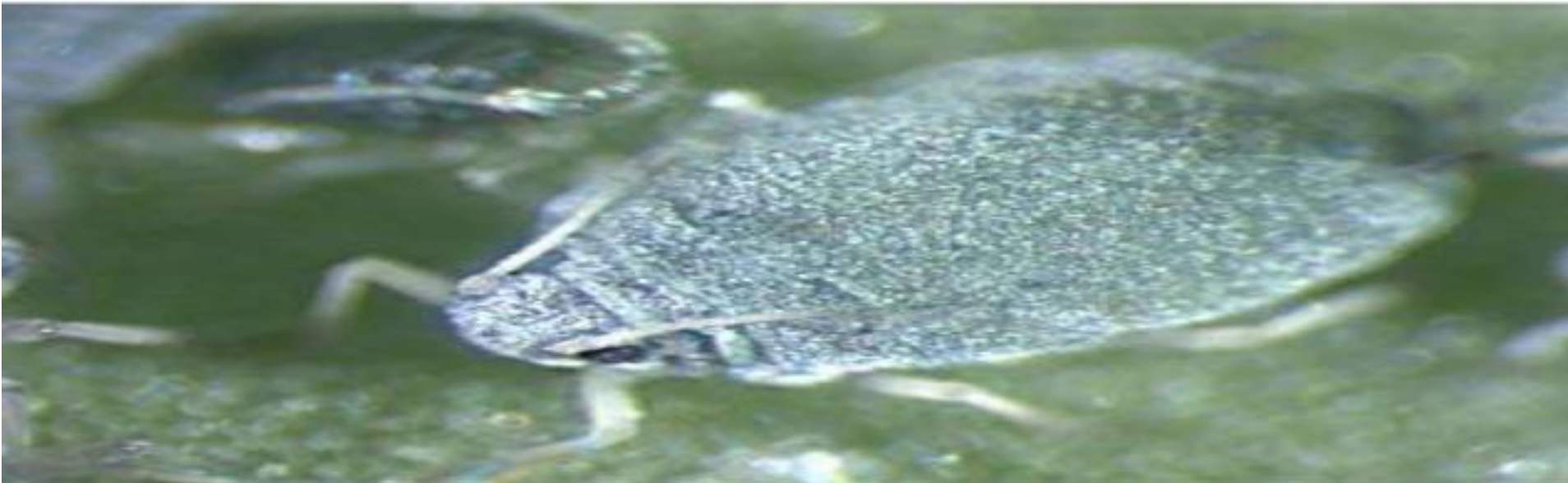
Aceria jasmini

- Jasmine mite
- Mainly in tamilnadu
- White hairy growth on surface of leaves, tender stem & flower bud.
- Flower production is affected.



Acalitus gossypii

- Leaf blister mite- Bihar
- Cotton wooly mite- Gujarat
- Attack on ball and cause greater loss.



Phyllocate olenvora

- Citrus rust mite



Tetranychus cinnabarinus

- Host- Vegetable, Fruit, **Cotton** & ornamental plants.



Damage

- More troublesome in warm dry weather
- Leaves get covered with strands of webbing finally affect photosynthesis.
- Leaves dry and then fall off
- Flowering and fruit setting in plants is greatly affected.

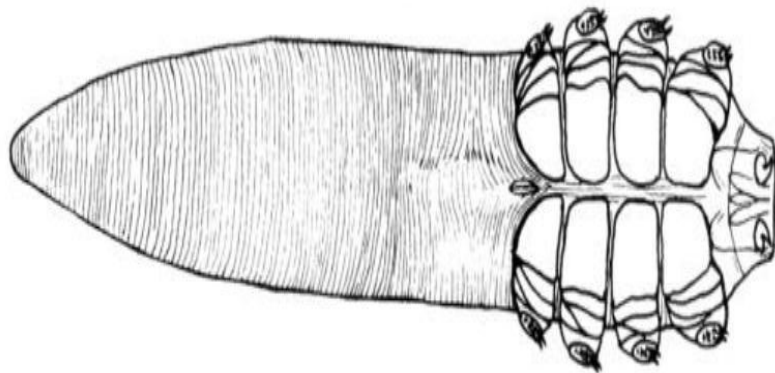
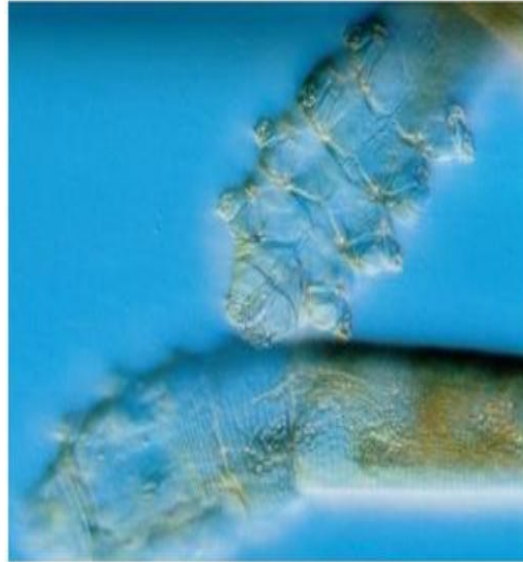
Effects on Humans

- Dermatitis or other tissue damage.
- Loss of blood or other tissue fluids.
- Transfer of pathogenic agents.
- Strong allergic reactions (\$10 billion each yr.)
- Livestock: skin damage as much as \$45 million worth each year.

Demodicidae

“Follicle Mites”

- Tenth to a fourth of a mm long.
- 2 species:
 - *Demodex folliculorum*
 - *Demodex brevis*



Dermatitis

- Very common
- Usually on skin of face, especially the eyelash and nose.
- 20% of individuals age 10-20 years is infested.
- 100% of the aged have them.
- In most cases they seem to be beneficial to us.
- Saprophytic mites are benign except when they invade the dermis, causing dermatitis.
 - Acne
 - Eyelashes fall out
 - Invade living tissue (rare).

Pyroglyphidae

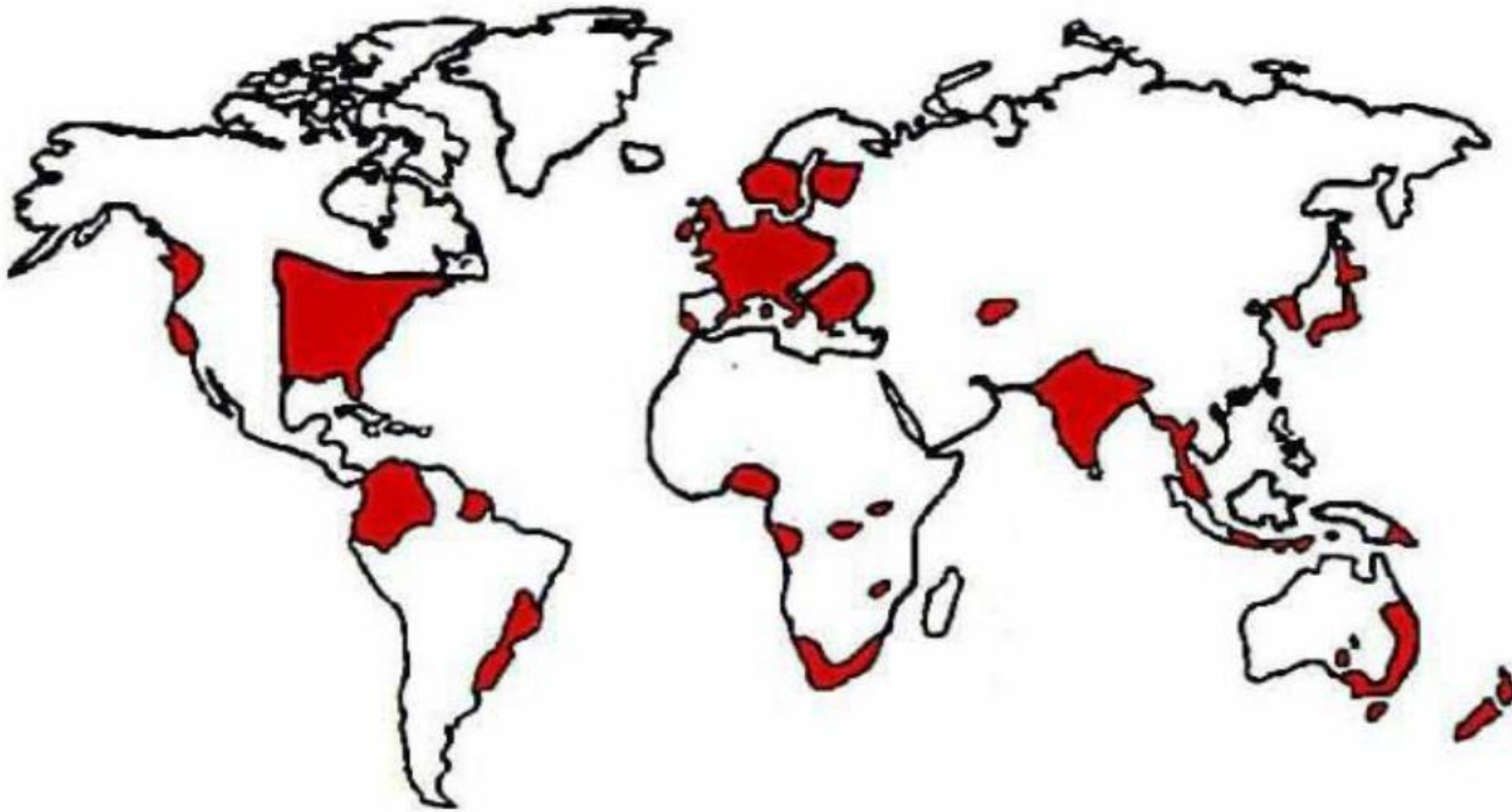
“House-Dust Mites”

- 2 species we are concerned with:

Dermatophagoides pteronyssinos (European House Dust Mite)

Dermatophagoides farinae (American House Dust Mite)





Areas at highest risk for dust mite problems.

Scrub Typhus

“Japanese River Fever”

- *Vector species:*
 - *Leptotrombidium deliense*
 - *L. akamushi* (Japan)
 - *L. fletcheri* (Malaysia)
- *Pathogen:*
 - *Orientia tsutsugamushi* (rickettsia)



Scrub Typhus

Reservoir – mites

Zoonotic: humans are accidental hosts

Transovarial transmission (also co-feeding transmission).

Distribution – Japan, SE Asia and islands of Indian Ocean and SW Pacific, coastal North Queensland, Australia

History:

WWII (1939-45) incidence in troops in the Asia-Pacific area was second only to malaria.

Scabies Rash



Sarcoptidae “Scabies Mites”

- *Sarcoptes scabiei*
- Also called the “itch mite” of humans
- It causes the “Seven Year Itch” or “Norwegian Itch”
- Not Vectors of any disease.



Trombiculidae

“Scrub Typhus and Chigger Mites”

- Around 3000 spp. Worldwide.
- 20 spp. Medically important (attack people).
- We will discuss 3 of the species.



Chigger Mites

“Harvest Mites or Red Bugs”

- (1) *Trombicula alfreddugesi*
- Distribution
 - Continental U.S. from New England to California (not north of Nebraska)
 - Second growth cutover areas
 - Moist microenv. Within grassy, weedy or wooded areas, especially wild berry patches.
- Seasonality
 - Active May-September

Epidemiology

- **People infected following bite of larval mite.**
 - Visiting or working in mite islands.
- **Associated with fringe habitats**
 - Habitats separating two major vegetation zones
 - Areas often heavily populated with rodent host.
- **Risk of transmission often related to habitat diversity.**
 - Number of areas of different types of vegetation.

Control/Prevention

- **Repellents:**
 - DEET, dibutyl phthalate, dimethyl carbamate or benzyl benzoate.
- **Insecticides**
- **Protective clothing**
 - Permethrin on clothes.
- **Mechanical control**

Thank you

References:

<https://www.healthline.com/health/mite-bites>

<http://www.idph.state.il.us/envhealth/pcmities.htm>