



# Soil Mites

McDonald Woods  
Chicago Botanic Garden



The soil mites in this catalogue were collected as part of a year-long study of microarthropods in mesic, dry mesic, upland forest and buckthorn communities in Mary Mix McDonald Woods of the Chicago Botanic Garden, Glencoe, Illinois.

James Steffen, Principal Investigator

Joan Palincsar, Tentative Identifications



The purpose of this catalogue is to present the diversity of soil mites in a way that is an aid to identification of many local groups. A generalized diagram of a mite is shown on page 6, examples of the major groups are next, and diagrams typical of each major group are found at the front of each section. The top line of each mite description gives the family name and the next line gives the genus if known.

Terminology to identify the mites has been abbreviated as much as possible. Also, much information available in taxonomic keys has been omitted. For further information, consult *A Manual of Acarology*, 3<sup>rd</sup> Edition, edited by Walter Krantz and David E. Walter, Texas Tech Press, 2009.

Many structures are too small to see in the photographs, so diagrams, arrows or circles have been provided to aid study under higher power through a microscope.

Abundance is estimated for a pit trap study using the following terms: rare = < 5 individuals seen out of a total of 8600 mites in the survey, uncommon = 5 – 50, common = 51 - 500, abundant = 501 – >1000.





# Mites in this Catalogue

## Mesostigmata

Metagynella

Porrhostaspis

Pergamasus

Paragamasus

Holoparasitus

Dendrolaelaps

Veigaia

Epicriopsis

Macrocheles

## Oribatidae

Phthiracarus

Hoplophthiracarus

Euphthiracarus

Acrotritia

Nothrus

Ommatocepheus

Eremobelba

Basilobelba

Cultroribula

Carabodidae

Tectocepheus

## Oribatidae

(cont)

Moritzoppia

Oppiella nova

Quadroppia

Suctobelba

Scapheremaeus

Oribatula

Scheloribates

Ceratozetidae

Anachipteria

Oribatella





# Mites in this Catalogue (cont.)

## **Oribatidae**

(cont.)

Parakalumma

Neoribates

Orthogalumna

## **Astigmata**

Astigmata

## **Prostigmata**

Eupodes

Linopodes

Rhagididae

Bdella

Cyta

Armascirus

Anystis

Cheyletidae

## **Prostigmata**

(cont.)

**Calyptostomatidae**

Trombidium

Microtrombidium

Heterostigmata

Scutacarus

Imparipes

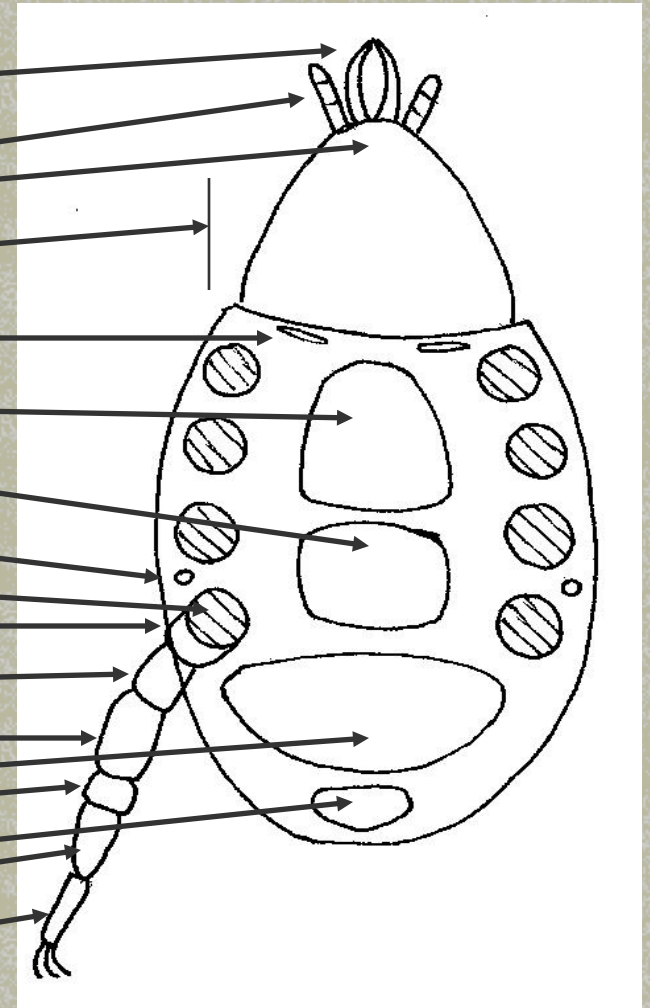
**Endeostigmata**

Alycus

Pachygnathus

# Generalized Mite

- Chelicera
- Palp (often same divisions as leg)
- Subcapitulum
- Prodorsum
- Stigma
- Sternal shield
- Epigynial shield (female)
- Stigma (alternate site)
- Leg bases
- Coxa
- Trochanter
- Femur
- Ventral shield
- Genu
- Anal shield
- Tibia
- Tarsus



# MAJOR GROUPS OF MITES

**Prostigmata**



**Mesostigmata**



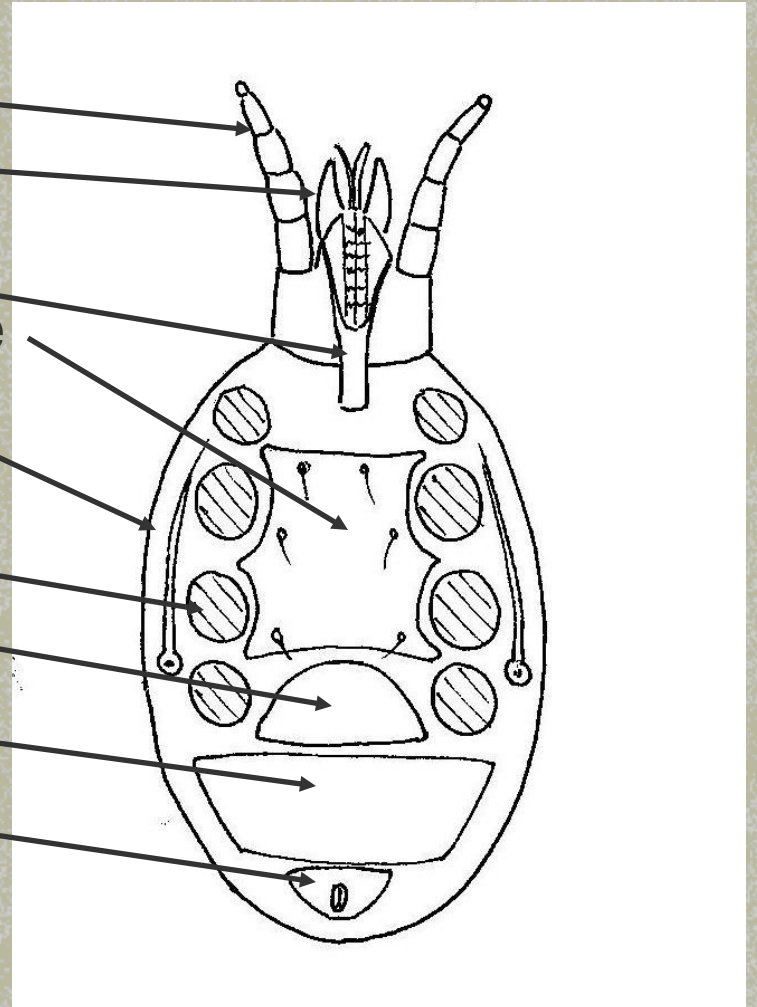
**Oribatida**





# Typical Mesostigmatid Mite

- Palp
- Corniculus
- Tritosternum
- Sternal shield with setae
- Stigma with peritreme
- Leg bases
- Epigynial shield
- Ventral shield
- Anal shield



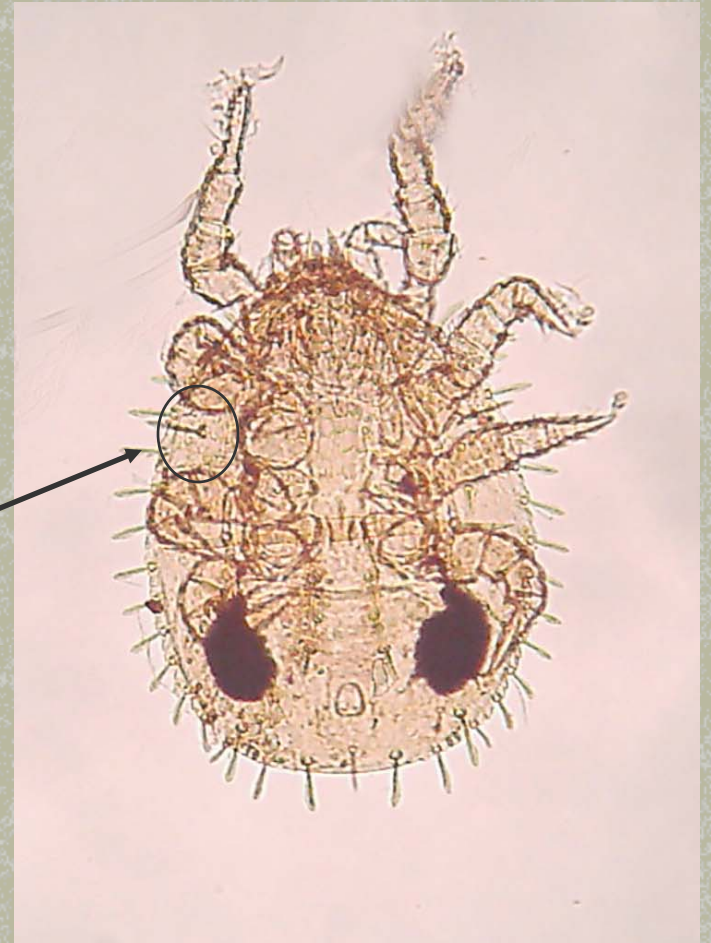
# Uropodidae

- Metagynella
- Legs can be withdrawn into hollows in cuticle (turtle mites)
- Legs I and II directed anteriorly
- Epigynial shield extends posterior to coxae IV
- Rare



# Zerconidae

- Parazercon
- Marginal setae along serrated margins
- Broad ventrianal shield
- Detail seen at 450x: peritrematic shield with 3 setae





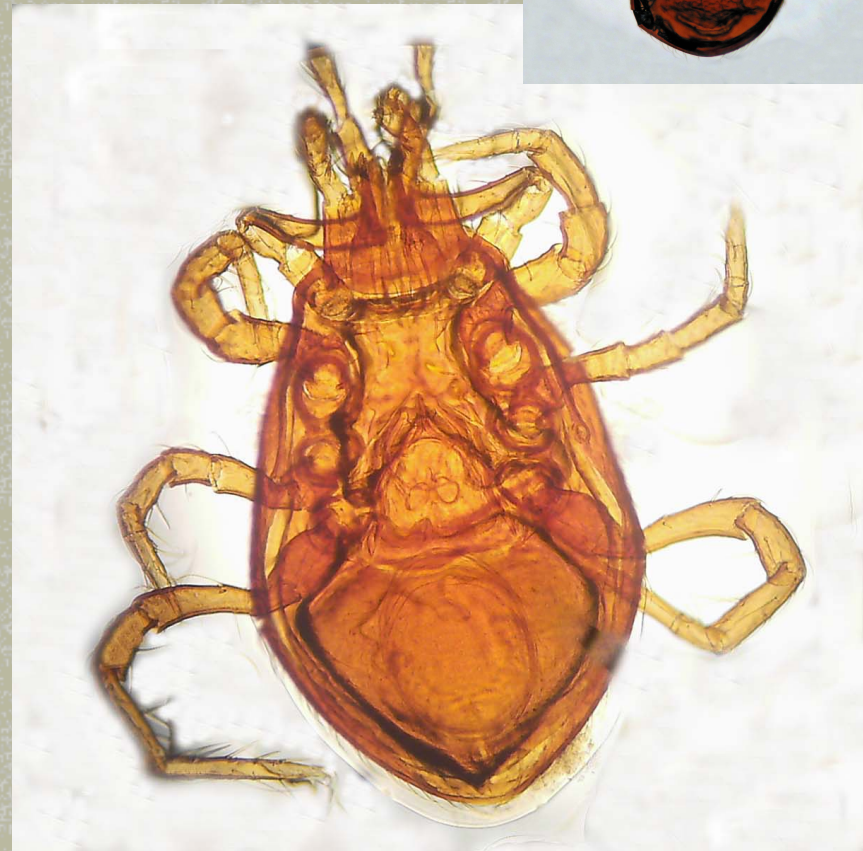
# Parasitidae

- Porrhostaspis
- Detail seen at 450x:  
seta of palpfemur  
divided into narrow  
processes
- Triangular genital shield  
with distal points
- Divided dorsal shield
- Uncommon



# Parasitidae

- Pergamasus
- Triangular epigynial shield with pointed tip
- Stigma and peritreme on dorsal shield
- Detail seen at 450x:  
>30 dorsal setae
- Upper right inset shows male with enlarged second legs
- Common





# Parasitidae

## Paragamasus

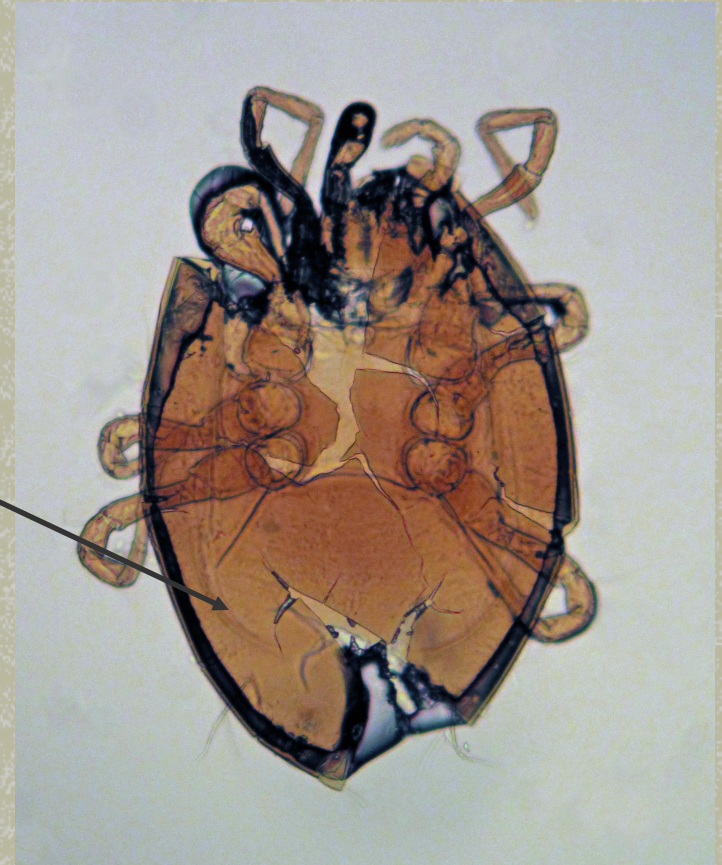
- Broad triangular epigynial shield
- Uncommon





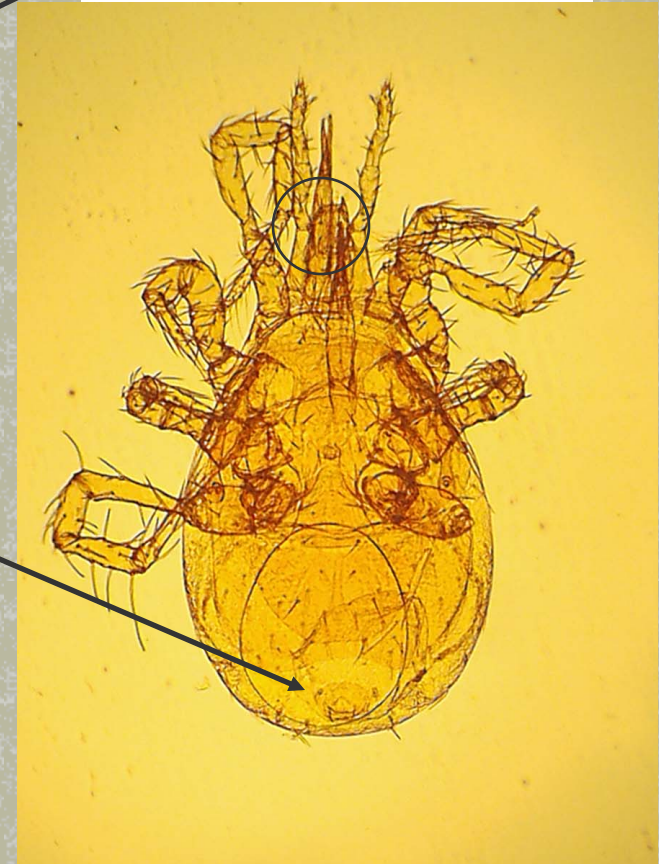
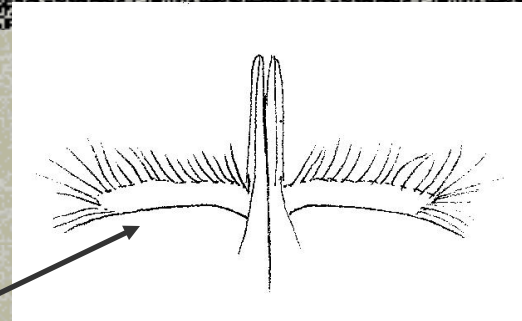
# Parasitidae

- Holoparasitus
- Dorsal shield fused posteriorly with ventral shield



# Veigaiidae

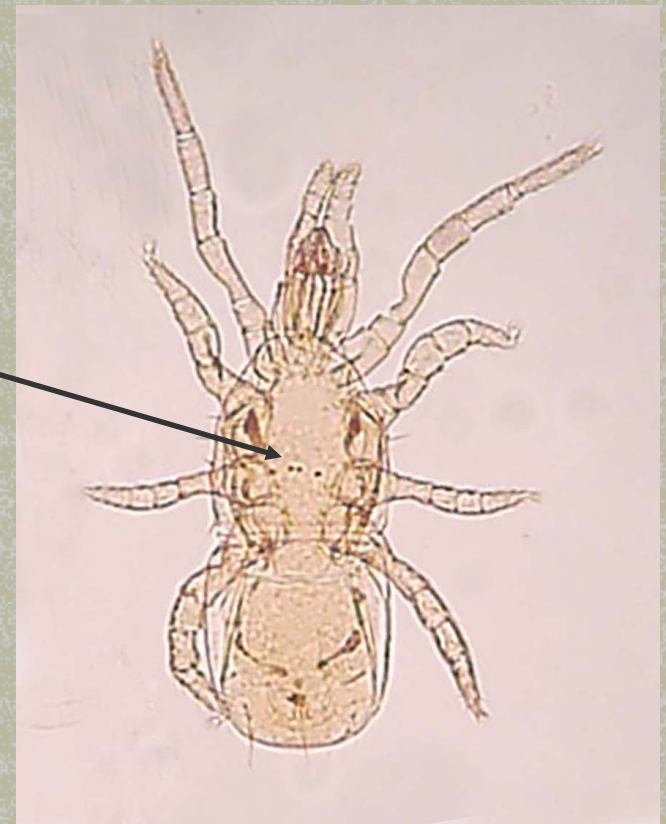
- Veigaia
- Detail seen at 450x: moustache- like internal mali (feathery mouthparts)
- Two part dorsal shield
- Separate anal shield
- Uncommon





# Digamasellidae

- Dendrolaelaps
- Dorsal shield divided
- Detail at 450x: setal pair j2 nearly in transverse alignment with pairs j1 and z1 (row of setae at anterior edge of dorsal shield)
- 4 sclerotic nodules in mid-posterior region
- Anterior portion of sternal shield weakly defined
- Palptarsal apotele 2-tined (flat projections on medial distal area of tarsus of palp)
- Leg 4 has 7 setae on genu and tibia





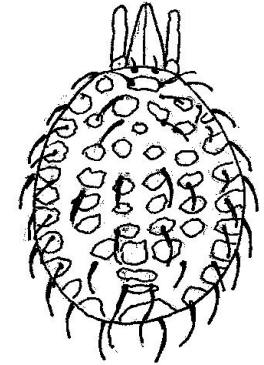
# Parholaspidae

- Krantzholaspis
- Corniculi bayonet-like
- Chelicerae with arthrodial brush
- Genital shield mound-shaped
- 



# Ameroseidae

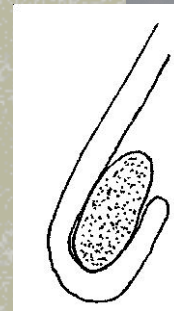
- Epicriopsis
- Ornamented dorsal shield
- Detail seen at 450x:  
<25 pairs of thickened setae
- Rare





# Macrochelidae

- Macrocheles
- Peritremes looped at stigma
- Rare





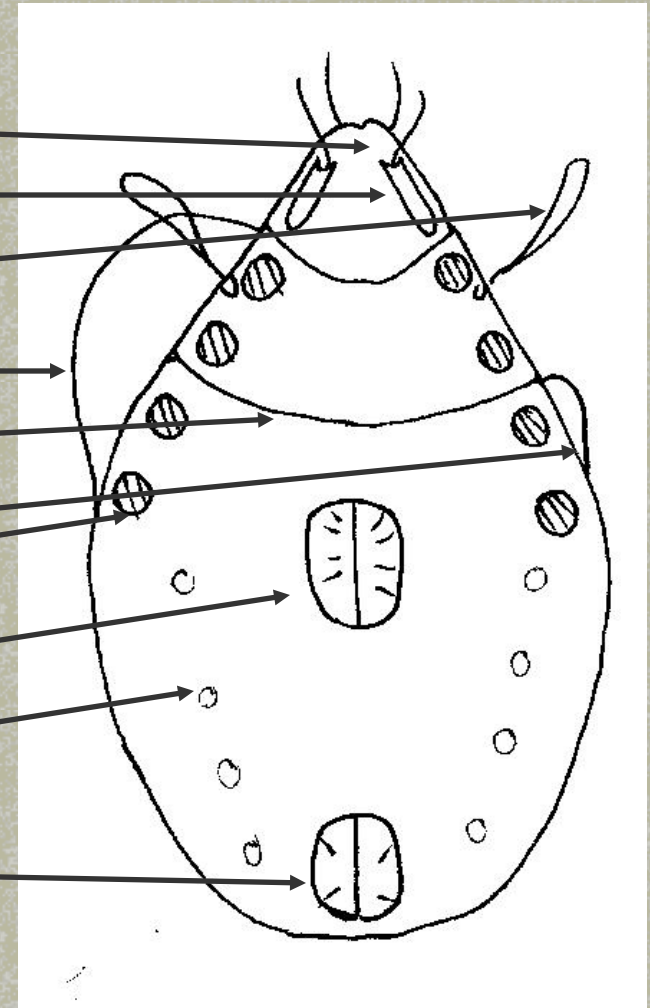
# Podocinidae

- Forelegs greatly elongated with paired setae at tip



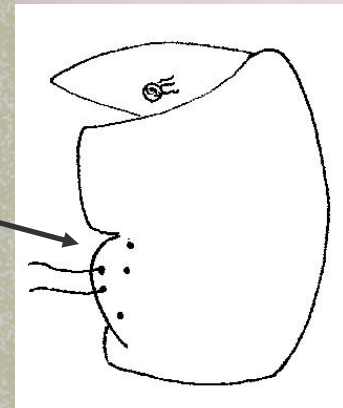
# Generalized Oribatid Mite

- Rostrum
- Lamella
- Bothridium or sensilla
- Pteromorph
- Sejugal groove
- Humeral area
- Leg bases
- Genital plate
- Porose areas
- Anal plate



# Phthiracaridae

- Phthiracarus
- Body form ptychoid
- Box mite; anogenital area broad; 2 separate plates
- Detail seen at 450x: 2 anal plate setae on medial margin, 3 short setae found more laterally in oblique row
- Uncommon





# Phthiracaridae

- Atropacarus
- Box mite; anogenital area broad; 2 separate plates
- Anal plate with 4 closely spaced setae on medial margin



# Phthiracaridae

- Hoplophthiracarus
- Box mite
- Detail seen at 450x:  
oblique anal plate  
setae same length  
as setae on its  
medial margin
- Rare

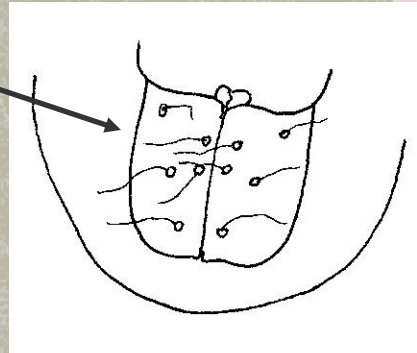


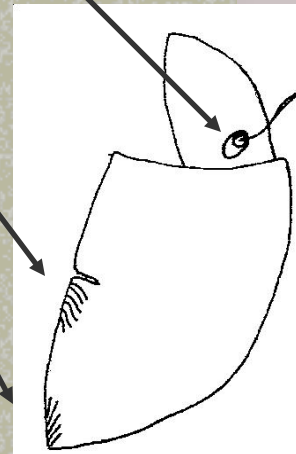
photo mag. 100x

actual size 750 um



# Euphthiracaridae

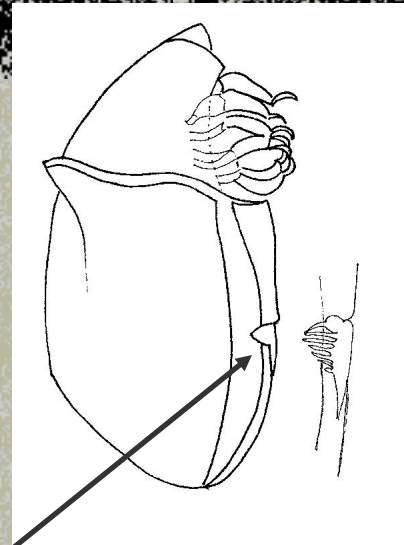
- Euphthiracarus
- Box mite
- Detail seen at 450x:  
Bothridial scale ventral  
to bothridium,  
“interlocking triangle” at  
both ends of anal region
- Rare





# Euphthiracaridae

- Acrotritia
- Box mite – body can be closed up for protection
- Detail seen at 450x: dark midventral “interlocking triangle”
- Uncommon



# Hypochthoniidae

- Hypochthonius
- Notogaster with single transverse scissure with vestigial setae
- Femur 1 with 5 setae





# Lohmanniidae

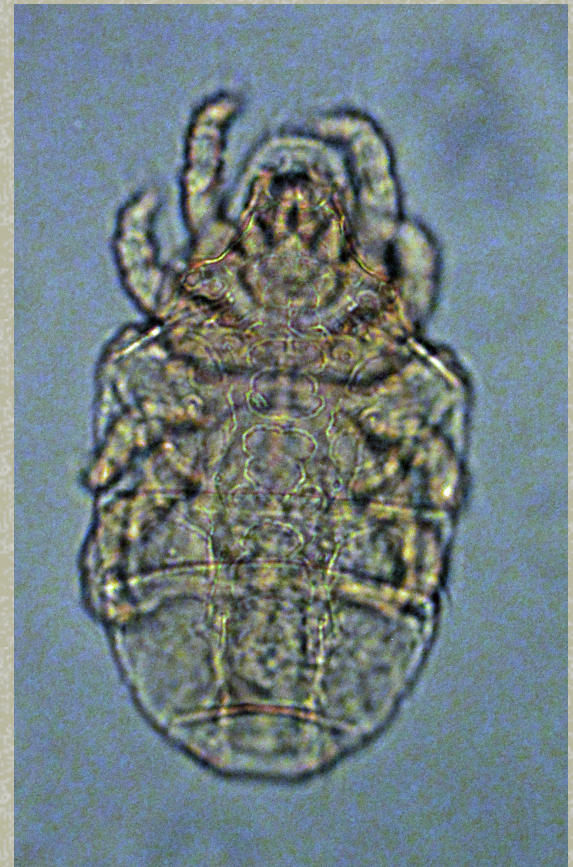
- Notogaster not subdivided transversely
- Prodorsum moveable, retractable into body
- Anterior margin of notogaster overhangs prodorsum





# Brachythoniidae

- Brachythonius
- Dorsum subdivided by 2 transverse scissures
- Ornamented with dorsal concavities



# Epilomannidae

- Epilomannia
- Dichoid, body can bend at junction between prodorsum and hysterosoma
- Body moderately elongated, prodorsum narrower





# Nanhermanniidae

- Nanhermannia
- Pair of crescent-shaped scissures curved around genital shield





# Nothridae

- Nothrus
- Sculptured surface
- Blocky shape
- Legs cylindrical, tarsi pointed
- Wide posterior setae
- Rare



photo mag. 100x

actual size 1 mm

# Hermanniellidae

- Hermanniella
- Pair of funnel-shaped gland openings protrudes laterally
- Rostrum without incision
- Bothridia lateral





# Cepheidae

- Ommatocepheus
- Rostral and lamellar setae thick and conspicuous
- Bothridium round and dark
- Detail seen at 450x: sculptured integument
- Rare

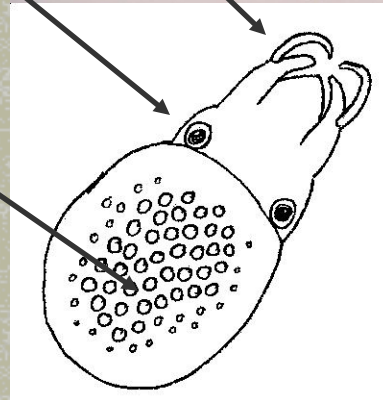


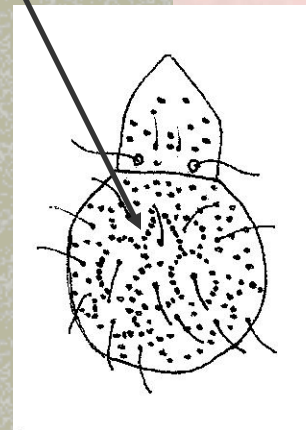
photo mag. 100x

actual size 500 um



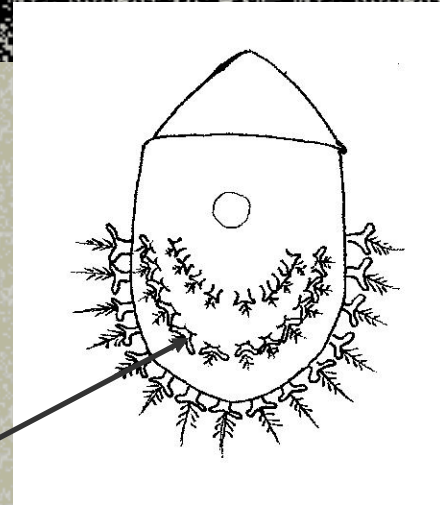
# Eremobelbidae

- Eremobelba
- Detail seen at 450x:  
long notogastral  
setae surrounded by  
circles of tubercles
- Rare



# Basilobelbidae

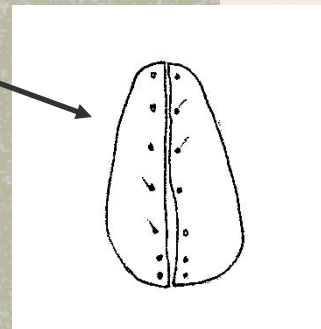
- Basilobelba
- Setae on papillae
- Detail seen at 450x: scalps (previous molts) attached to dorsal side. The edge of each scalp can be seen because it is outlined by setae arranged in a semicircle.
- Rare





# Eremaeidae

- Pear shaped anal plate
- Detail seen at 450x:  
7 pairs of setae on  
anal plate
- Rare



# Eremaeidae

- Eueremaeus
- Anal plates with more than 2 pairs of setae





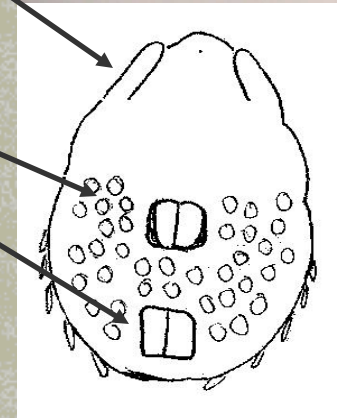
# Astegistidae

- Cultroribula
- Small size,
- Rounded outline,
- Genital and anal plates adjacent
- Uncommon



# Carabodidae

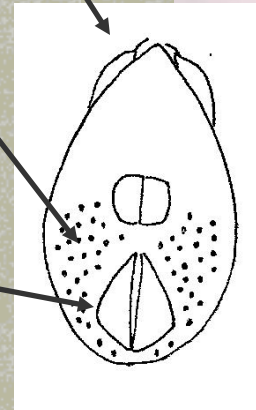
- Detail seen at 450x:
- Broad lamellae,
- Sculptured integument,
- Squared anal plate
- Rare





# Tectocephidae

- Tectocephus
- Details seen at 450x:  
Broad, almost parallel lamellae (narrow flaps on each side of head end). Note integument with small tubercles,
- Note triangular anal plate
- Uncommon



# Oppiidae

- Moritzoppia
- Legs somewhat beadlike
- Dorso-sejugal groove convex, projecting deeply into prodorsum
- Rare





# Oppiidae

- Oppiella
- Focus is on dorsal side to show costula and crista (thickened ridges that are seen better at 450x)
- Note beadlike leg segments
- Rare



# Quadroppiidae

- Quadroppia
- Focus is on dorsal side to show angled costula
- Long crista
- Rare





# Suctobelbidae

- Suctobelba
- Detail seen at 450x:  
teeth on rostrum
- Relatively long,  
beadlike legs
- Rare

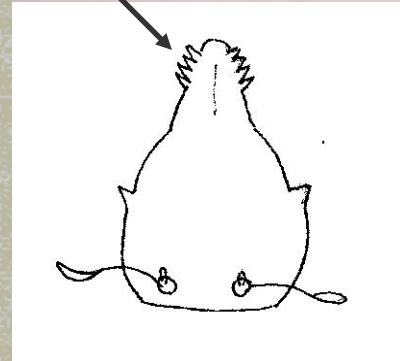


photo mag. 100x

actual size 400 um

# Suctobelbidae

- Suctobelbella
- Anterior margin of notogaster with tubercles
- Fewer teeth on rostrum than Suctobelba





# Cymbaeremaeidae

- Scapheremaeus
- Notogaster (dorsal surface) has dark sculpturing and conspicuous border
- Rare

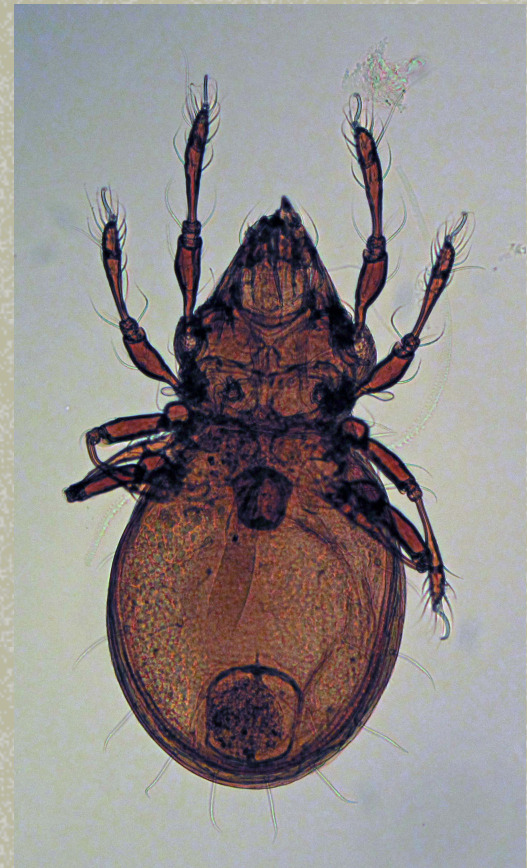


photo mag. 100x

actual size 450 um

# Otocepheidae

- Dolicheremaeus
- Epimera II and IV not distinctly delineated
- Pedotectum II well-developed





# Gustaviidae

- Gustavia
- Greatly elongated narrow chelicerae with larger teeth at tip



# Eremellidae

- Eremella
- Notogaster sculptured
- Notogastral setae feathery





# Eremellidae

- Liculocephus
- Rostrum without medial incision
- Costulae H-shaped
- Notogastral setae short



# Micreremidae

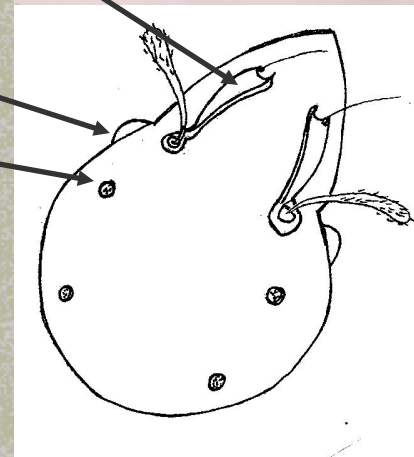
- Micreremus
- Aggenital setae absent
- Femora III and IV with 2 porose areas each





# Oribatulidae

- Oribatula
- Details seen at 450x: lamella with seta,
- Humeral hump,
- Porose areas
- Abundant



# Scheloribatidae

- Scheloribates
- Small pteromorphs (wing-like projections)
- Uncommon



photo mag. 100x

actual size 500 um



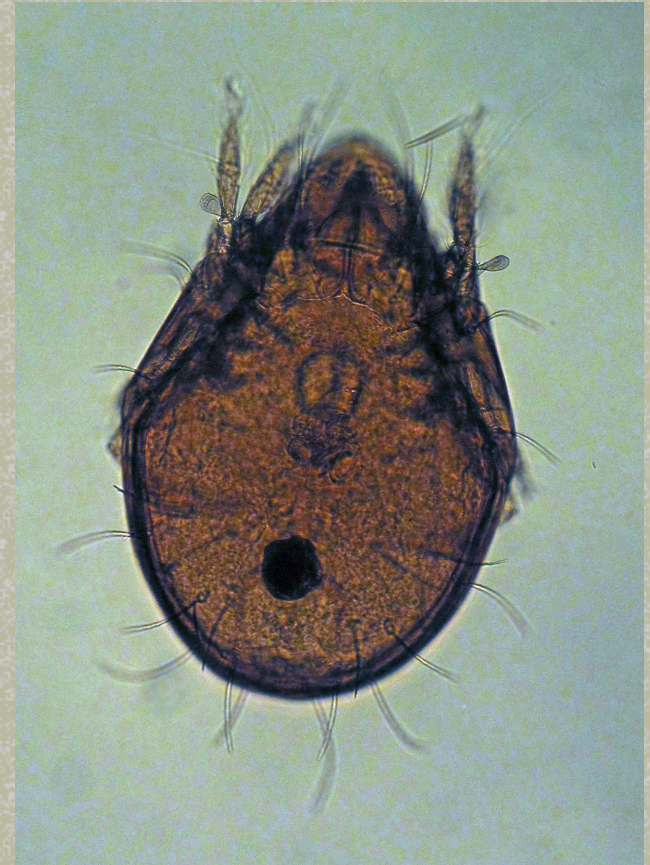
# Haplozetidae

- Haplozetes
- Small pteromorphs with hinge muscles
- Notogaster with elongate saccules
- Bothridial seta well developed
- Agenital setae present



# Haplozetidae

- Peloribates
- Notogaster with rounded saccules
- Tridactylous





# Haplozetidae

- Protoribates
- Notogaster with porose areas



# Ceratozetidae

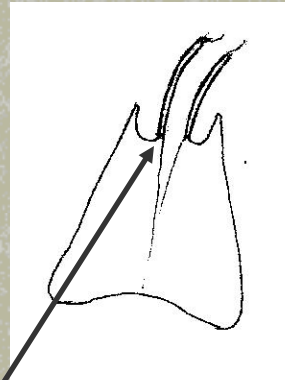
- Dark, globular shape, prodorsum shorter than notogaster
- Pteromorphs present
- Rare





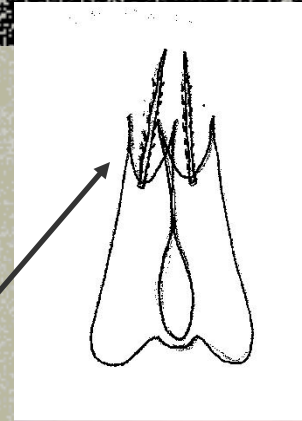
# Anachipteridae

- Anachipteria
- Dark, rounded body
- Detail seen at 450x: smooth lamellar seta arising from inner cusp of lamella
- No anterior tooth on pteromorph
- Rare



# Oribatellidae

- Oribatella
- Detail seen at 450x: cusps of lamellae (flaps on prodorsum) deeply incised with lamellar setae (having bristles) inserted at center of cusp
- Triangular pteromorphs (wing-like side flaps)
- Uncommon





# Parakalummidae

- Parakalumma
- Movable ear-shaped pteromorphs (pointed at anterior end in this species)
- Globular shape
- Common



# Parakalummidae

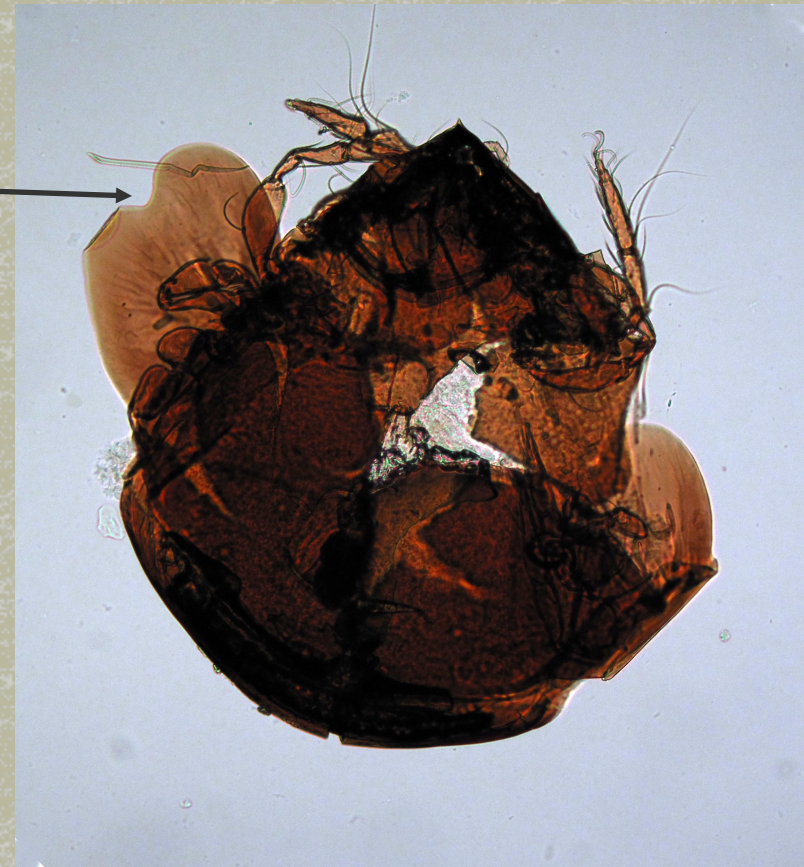
- Neoribates
- Moveable, ear-shaped pteromorphs (rounded at the anterior end in this species)
- Globular shape
- Common





# Galumnidae

- Orthogalumna
- Noticeable indentation on pteromorph
- Globular shape
- Common



# Galumnellidae

- Pteromorph with furrow, appearing bilobed
- Rostrum acuminate





# Hypopus

- Immature Oribatid
- Small, oval, 2 pairs of legs
- Attaches to insects by large ventral sucker plate
- No mouthparts
- Abundant



Endeostigmata

# Alycidae

- Alycus
- Hypertrichous  
(fuzzy), soft pale  
body
- Common



photo mag. 450x

actual size 450 um



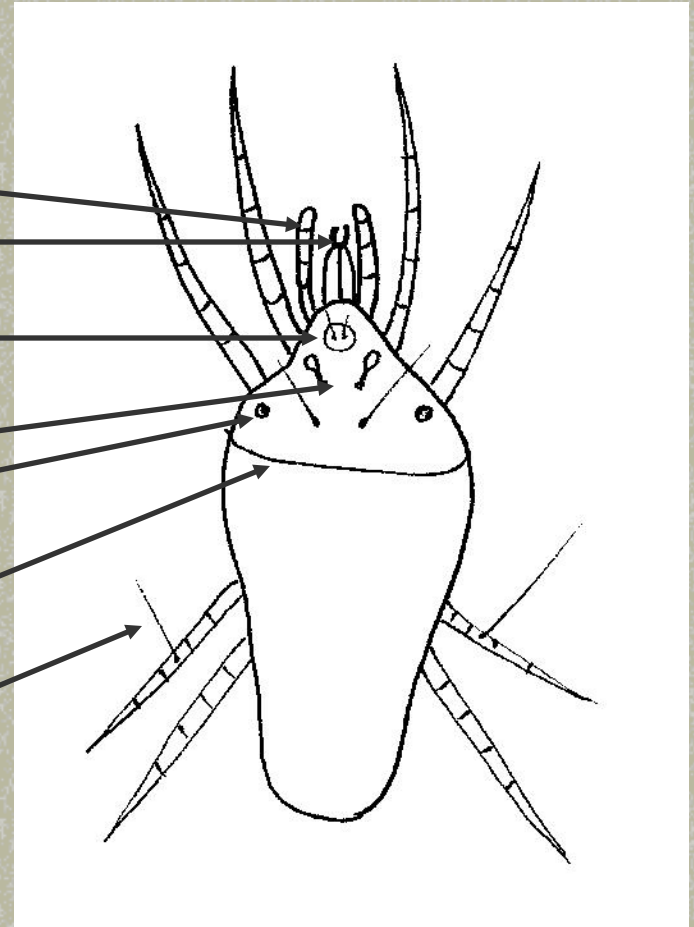
# Alycidae

- Pachygnathus
- Chelicerae  
attenuate-edentate,  
without setae



# Typical Prostigmatid Mite

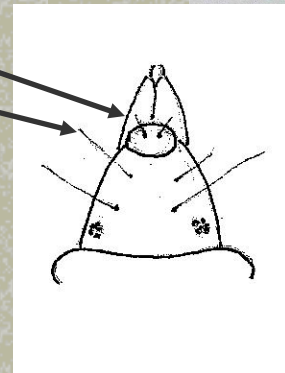
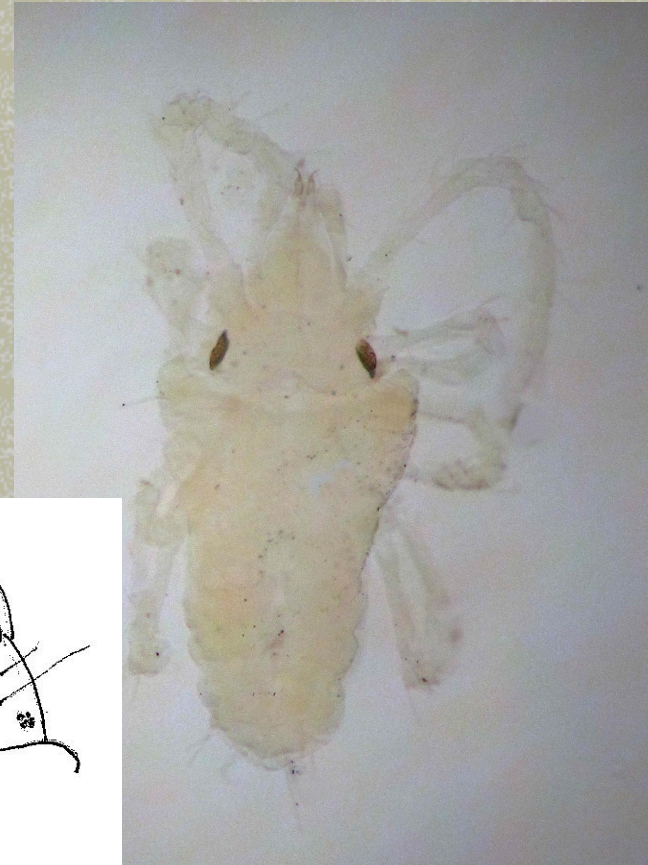
- Palp
- Chelicera
- Naso
- Specialized setae
- Eyespot
- Sejugal groove
- Trichobothrium  
(elongated seta)





# Eupodidae

- Eupodes
- Small pale mites with short legs
- Detail seen at 450x: note naso,
- 2 pairs of prodorsal trichobothria
- Abundant



# Eupodidae

- Cocceupodes
- Two pairs of basal subcapitular setae
- Sensillum expanded





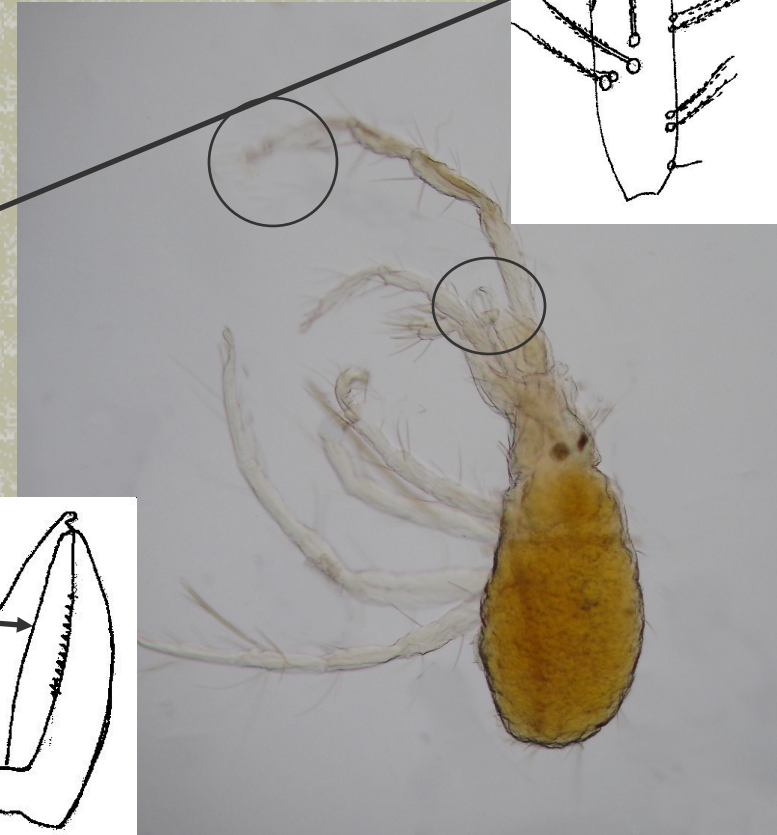
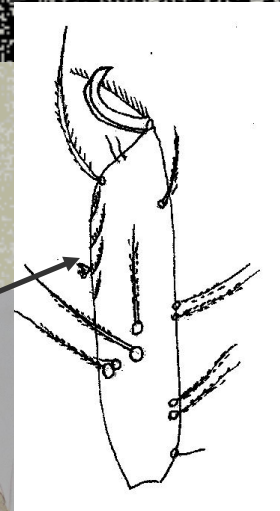
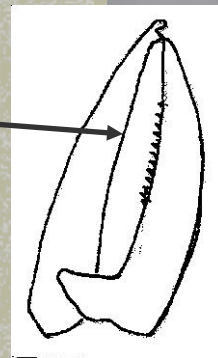
# Eupodidae

- Linopodes
- Extremely long first legs
- Usually yellow color with black interior
- Abundant



# Rhagididae

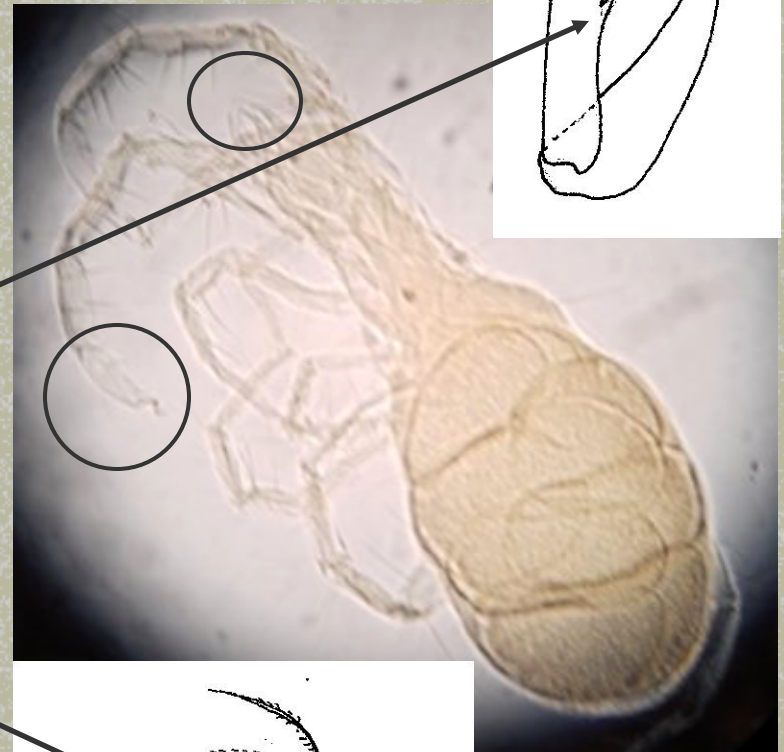
- Pale, soft-bodied mite
- Long legs I
- Very large chelicerae
- Detail seen at 1000x: solenidia (small usually recumbent setae) on leg I tarsus are oblique
- Detail seen at 450x: fixed cheliceral digit with straight inner margin
- Common





# Rhagididae

- Detail seen at 450x, tooth like projections on chelicera
- Viewed at 1000x: solenidia (small usually recumbent setae) on leg I tarsus are oblique
- Common



# Bdellidae

- Bdella
- Long narrow prosoma and chelicerae
- Long palps with long paired setae at distal end
- Detail seen at 450X: trichobothria (extra long setae) on tibia I and IV, tarsus III and IV
- Uncommon

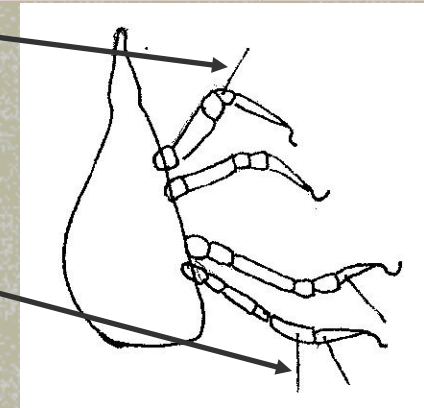


photo mag. 100x

actual size 650 um



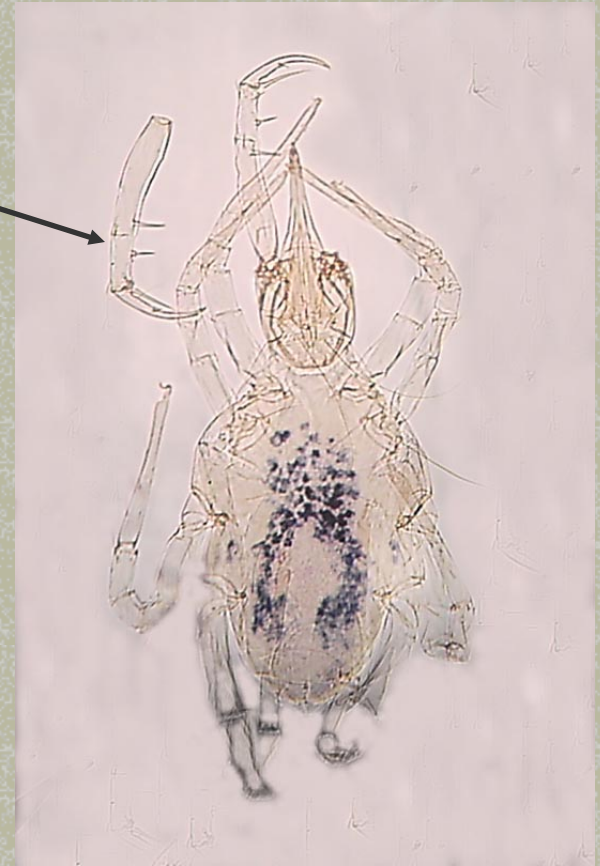
# Bdellidae

- Cyta
- Trichobothria absent on tarsus IV
- Chelicerae massive



# Cunaxidae

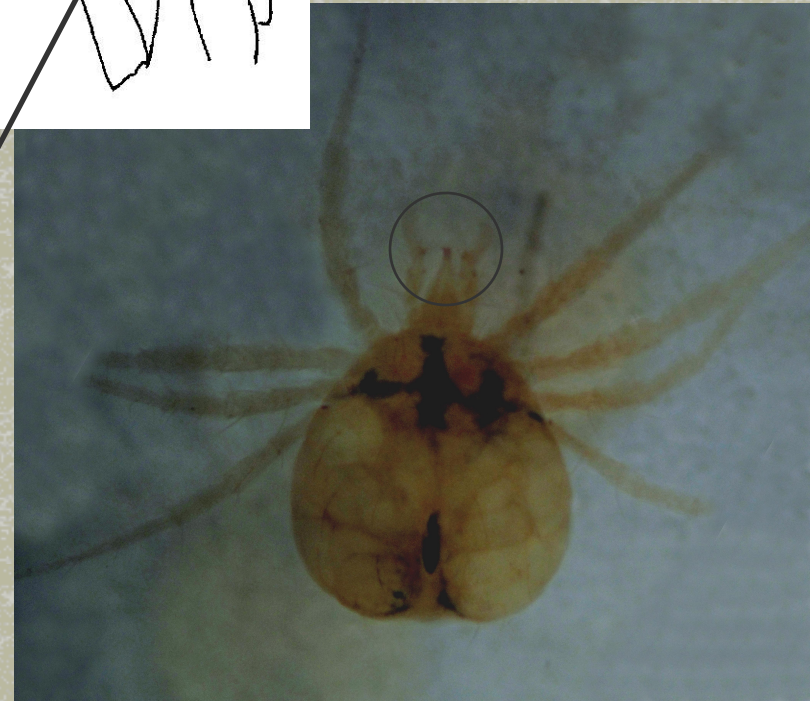
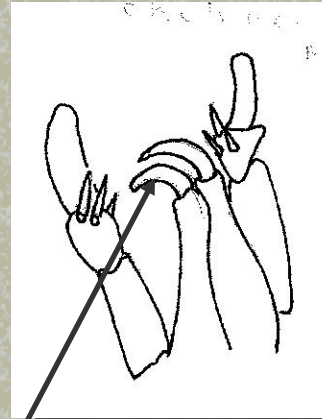
- Armascirus
- Palps with long spines (Right palp detached)
- Long chelicerae
- Rare





# Anystidae

- Anystis
- Spidery appearance
- Detail seen at 450x:  
note strong  
chelicerae
- Uncommon



# Cheyletidae?

- Leaf-like setae
- Rare

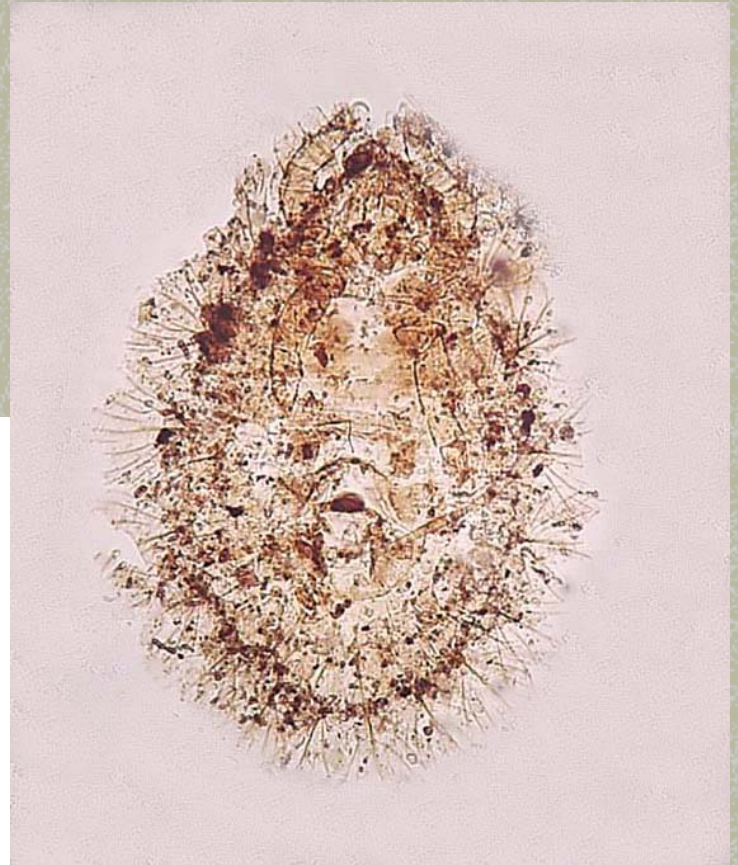
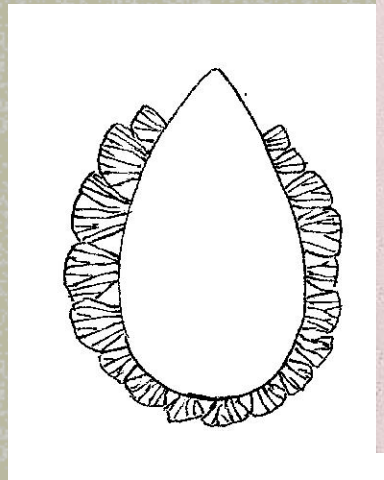


photo mag. 100x

actual size 700 um



# Calyptostomatidae

- Large size
- Covered with short setae
- Movable chelicerae long and stylet-like
- Rare

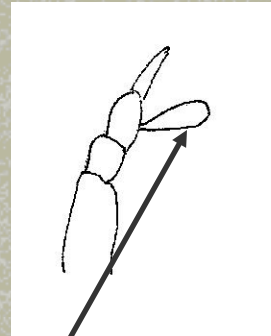


photo mag 40x

actual size 3 mm

# Trombidiidae

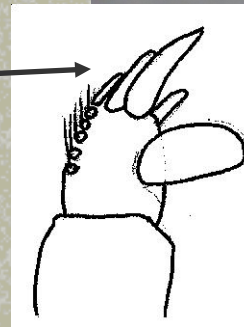
- Trombidium
- Large, often bright red
- Large spine on palpal tibia
- Palpal tarsus on side of tibia
- Fuzzy look from multiple setae
- Common





# Microtrombidiidae

- Body covered with short setae
- Detail seen at 450x: palpal tibia with large spine-like seta next to claw, other setae on tibia arranged in rows
- Rare



Heterostigmata

# Scutacaridae

- Scutacarus
- Round body
- No claws on leg IV
- Uncommon



photo mag. 450x

actual size 200 um



Heterostigmata

# Scutacaridae

- Imparipes
- Leg IV has distinct tarsus with claws
- Rare



photo mag. 450x

actual size 200 um

# Scutacaridae

- Lamnacarus
- Tibia and tarsus of leg IV coalesced
- Sternal plates covering base of legs

