

Mites and Human diseases in North America

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Objectives of Talk

Discuss mites that are agents of these diseases and/or problems in US

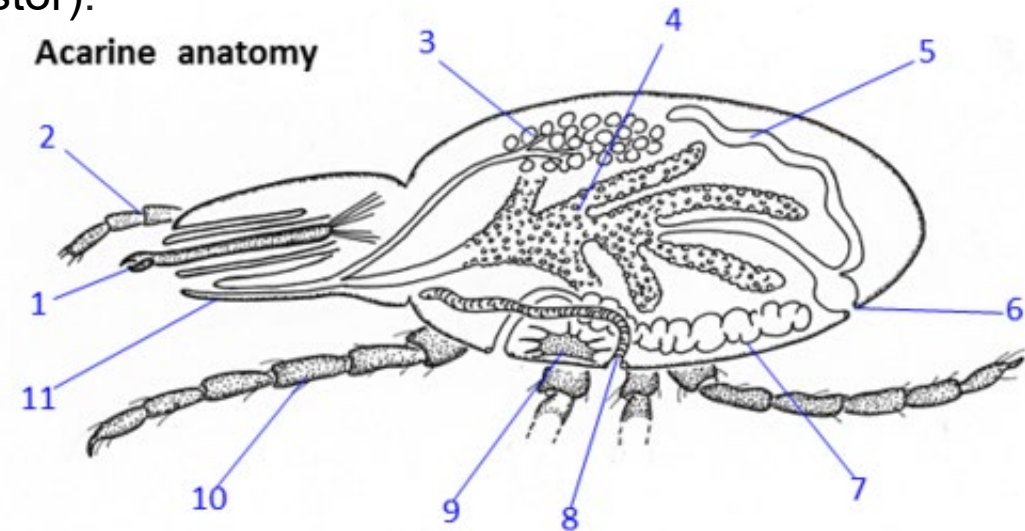
- Rickettsialpox (can be lethal)
- Scabies
- Demodex folliculitis
- Chiggers
- Oak gall dermatitis



Mites

Mites are small arachnids (eight-legged arthropods) of two large orders, the Acariformes and the Parasitoformes, which were historically grouped together in the subclass **Acari**. However, recent genetic analyses do not recover the two as each other's closest relative within Arachnida, rendering the group invalid as a clade (no common ancestor).

Class:	Arachnida
Mites are found in two superorders	
<ul style="list-style-type: none">•Acariformes (Mites)•Parasitoformes (Ticks and Mites)	



Mites are usually some shade of brown, but some species are red, orange, black or green, or some combination of these colors.

Velvet mite



Rickettsialpox

Saini R, Pui JC, Burgin S. Rickettsialpox: report of three cases and a review. J Am Acad Dermatol. 2004 Nov;51(5 Suppl):S137-42. doi: 10.1016/j.jaad.2004.03.036. Erratum in: J Am Acad Dermatol. 2004 Dec;51(6):1040. PMID: 15577753.

In June 2002, a 66-year-old female was admitted for work-up of a 3-day history of fever and a rash that had erupted that day. She reported seeing “a blister” on her right foot 1 week before, which she attributed to “rubbing from a new sneaker.” She felt tired and weak but denied headaches or other symptoms. She was on no new medications. She lived in the Bronx and reported seeing mice in her apartment.

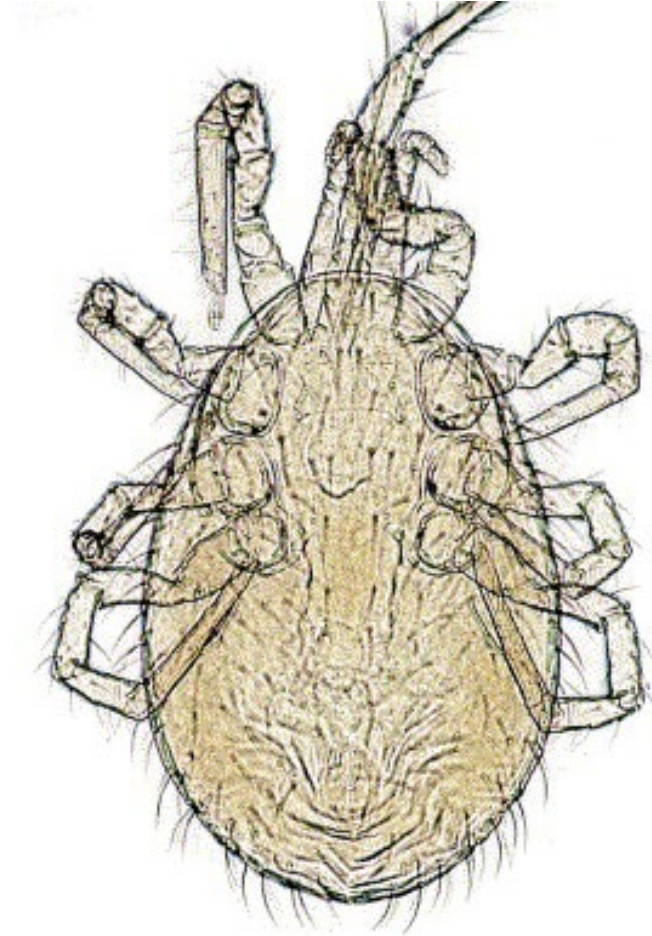


Physical examination revealed a comfortable patient with a temperature of 102°F. On the medial aspect of her right ankle was a tender 1 cm eschar with associated erythema and warmth that emanated diffusely up the leg. This was assessed as a cellulitis and the patient was placed on intravenous clindamycin. Examination of the rest of the integument revealed multiple papulovesicles on her chest, back, extremities, and right upper lip. There was no inguinal or other adenopathy.

Rickettsiapox



Eschar on ankle



- *Liponyssoides sanguineus*
- Rodent mite
- Bite transmits *Rickettsia akari*
- Infections usually occur when mice, the mites usual host, are removed from housing units leaving mites no other alternative to feed on
- NYC remains an epicenter for this disease
- Treated with doxycycline

Differential diagnosis of eschar/rash/fever

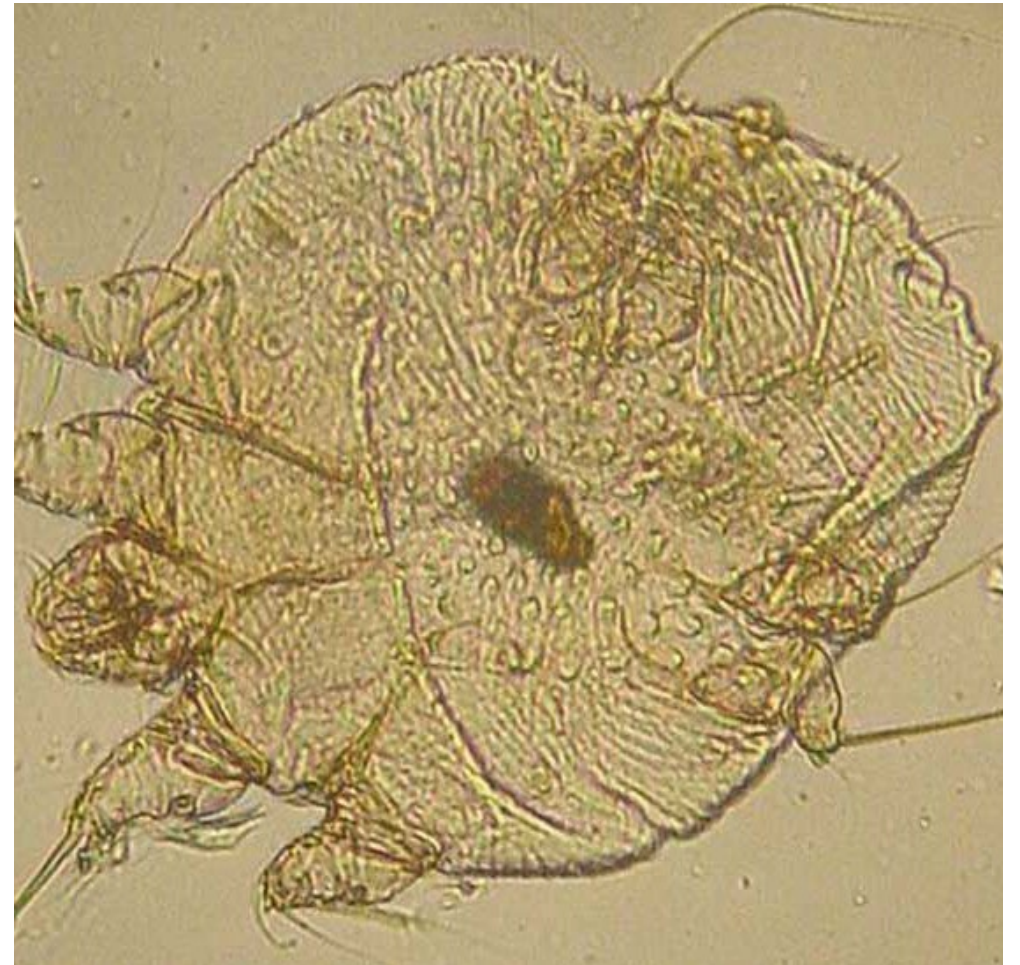
Infectious

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- Bacterial: ecthyma caused by Staphylococcus or Streptococcus, ecthyma gangrenosum, necrotizing fasciitis, anthrax, glanders, plague, phagedenic ulcer, rat bite fever, tularemia
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- Viral: orf/milker's nodule, herpes simplex virus
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- Rickettsial: scrub typhus, the spotted fever group including rickettsialpox, South African tick bite fever, Siberian tick typhus, Queensland tick typhus, and boutonneuse fever, Rickettsia parkeri, R. phillipi
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- Fungal: aspergillosis, fusariosis, mucormycosis

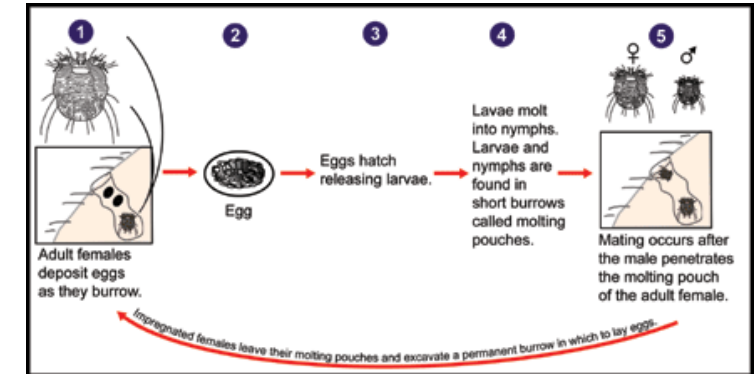
Inflammatory

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- Brown recluse spider bite
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- Thrombotic disease: antiphospholipid syndrome ulcers, coumadin and heparin necrosis, calciphylaxis
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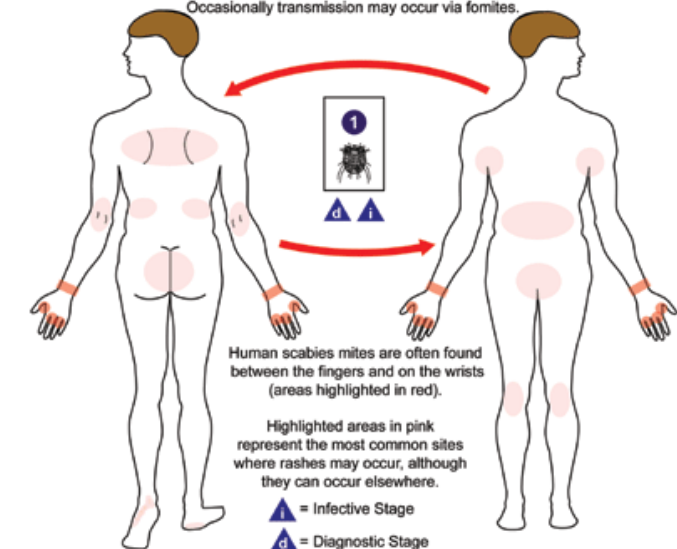
Scabies causes by the mite: *Sarcoptes scabiei*



Scabies; closeup of lesions



Transmission occurs primarily during person-to-person, skin-to-skin contact.
Occasionally transmission may occur via fomites.



Burrows

- Add a drop of India ink



Dermal videoscropy



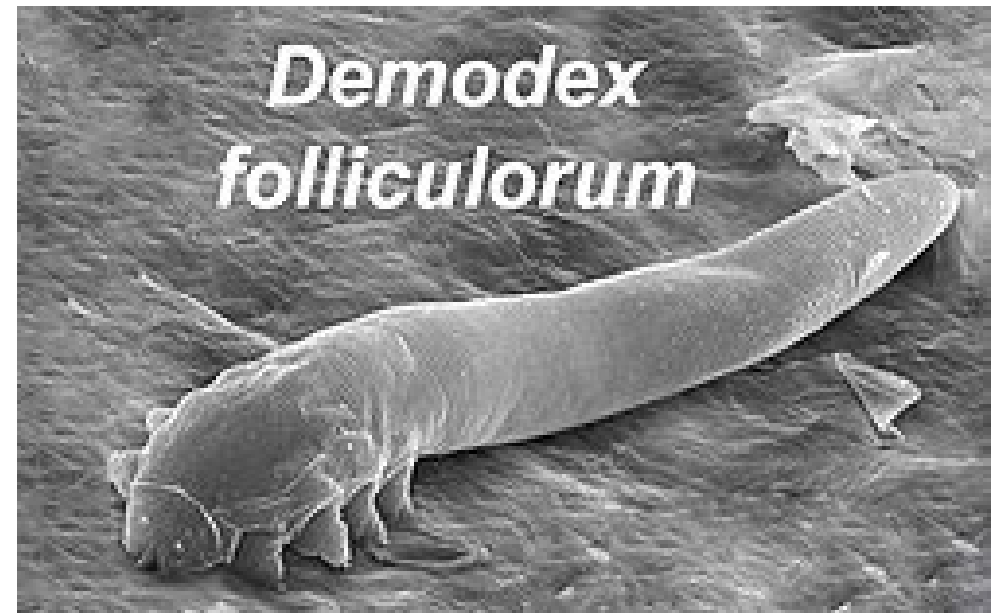
Mange in animals

- **Sarcoptic mange** can affect wild and domestic mammals and is often reported in wild canids such as red foxes, coyotes, gray wolves, and red wolves.



Commensal mites of humans

Two species live on humans, namely *Demodex folliculorum* and *D. brevis*



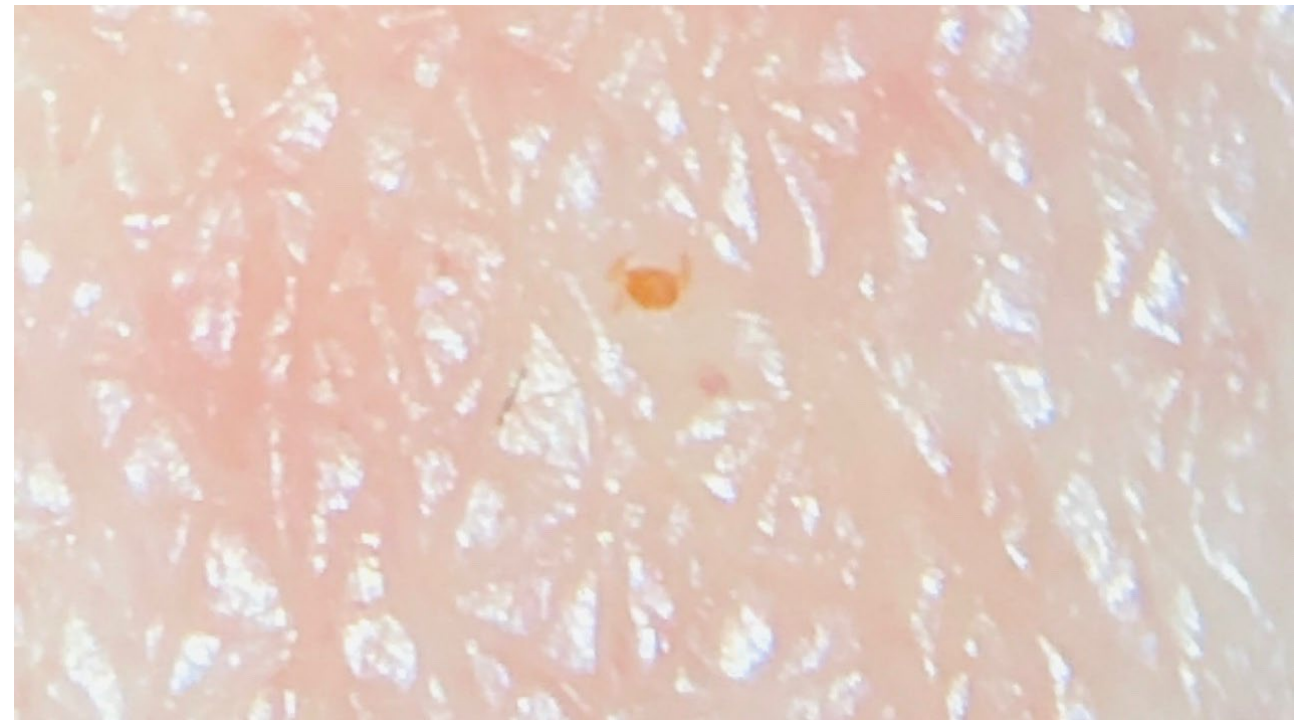
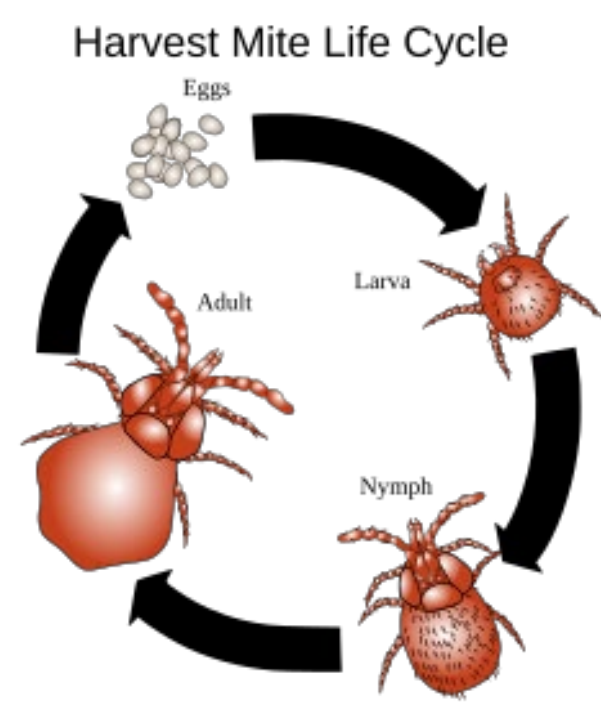
Demodecosis

- Common in sebaceous glands of the face: around corners of nose, cheeks especially in those with rosacea. Tip of the abdomen may protrude from hair follicle.
- Another commensal of the hair follicle is *Malazzezia*, a fungus, that when a nuisance causes Tinea Versicolor

Nuisance mites of humans

Harvest Mites (Britain)=Chiggers (US)

Scrub typhus=*Orientia tsutsugamushi*;
Southeast Asia

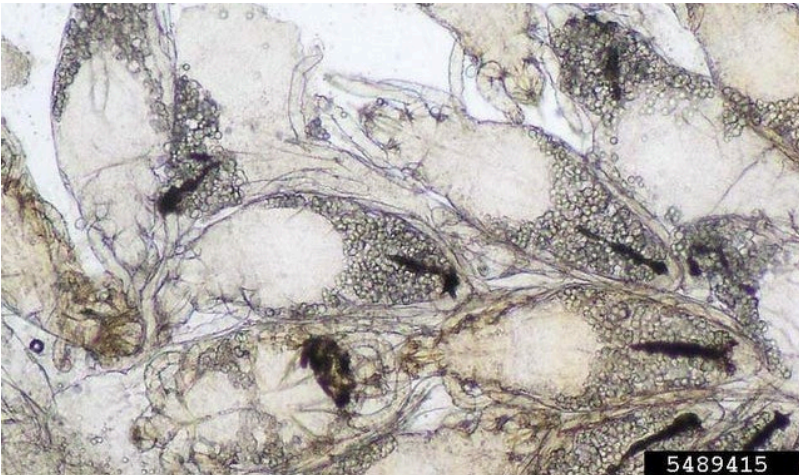
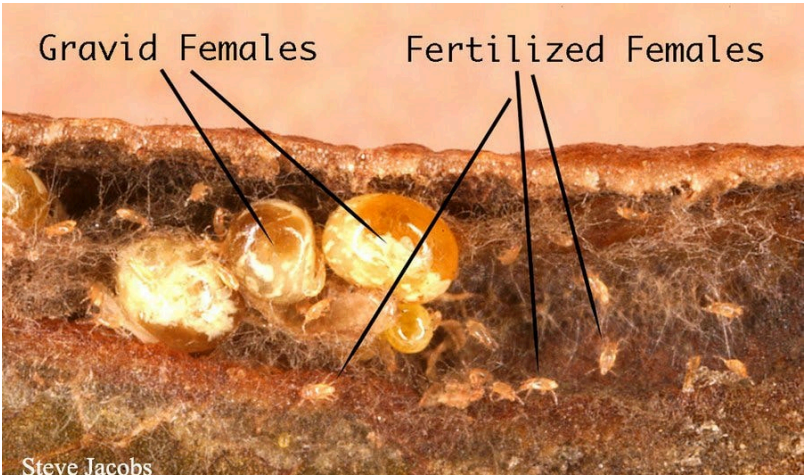


Marginal leaf fold gall (a fly midge)



Oak leaf itch mite=*Pymotes herfsi*

The first recognition of this mite in the U. S. occurred in Pittsburg, Kansas in the autumn of 2004 where it was estimated to have affected around 19,000 people. Since, it has been reported from Illinois, Nebraska, Ohio, Oklahoma, Missouri, Tennessee, Texas and Pennsylvania (Lancaster County). Now believed to feed on annual cicada eggs as well as well oak gall larvae.



Oak gall itch mite=*Pymotes herfsi*

- Newly emerged and mated females inject a neurotoxin in saliva into their hosts, which paralyzes the host and enables the gravid female mites to feed on the host's hemolymph. The posterior portion of the female enlarges as its progeny develops inside, and, within a few days, up to 250 adult mites emerge.

