

MITES

Glossary/Terminology

Chelicerae: piercing mouthparts

Coxae: basal segments of the leg that articulate with or are fused to the body wall.

Pedicel (stalk): thin extension off the end of the appendages/legs.

Setae: hair-like, cuticular process composed of hollow shaft found on the surface of the legs and body.

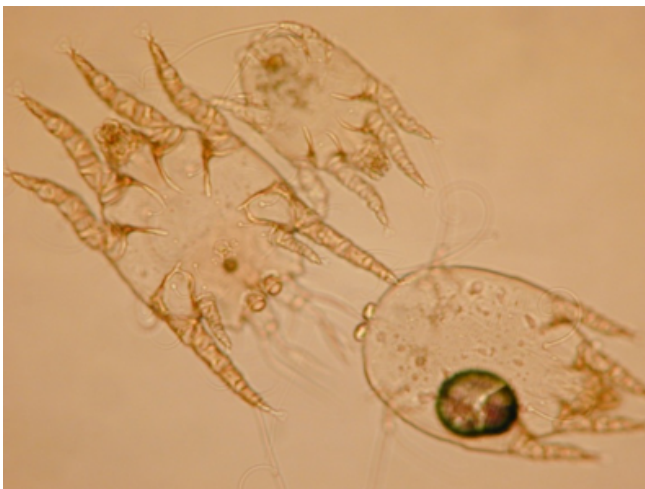
Tarsal suckers: an attachment organ found on the distal segments of the legs, typically on the end of the pedicel.

All mites including those of equines are phylum Arthropoda, class Arachnida, subclass Acari, order Acariformes. The suborder Sarcoptiformes or Astigmata contains the family Psoroptidae of which the genera *Chorioptes* and *Psoroptes* are equine parasites.

Categories

Chorioptes (equi) bovis

The genus has now been lumped into a single species although various populations of the mite are associated with specific areas of the body of specific host species. *Chorioptes* is the cause of leg mange of horses and is usually found in feathered area of fetlock on draft horses.



Oval body, coxae 1 and 2 separate from coxae 3 and 4 with tarsal suckers present on short stalks. All stages occur on host: adult → egg → larva → nymph; Egg to egg 3 weeks. The mite can survive off the horse for as long as 69 days in a suitable environment. It is more prevalent in cooler areas and during winter.

The mites feed on skin, do not burrow. The infestation is associated with foot stamping and “greasy heel.” The hypersensitivity of individual horses to the infestation varies considerably so that some horses will be adversely affected by comparatively few mites where as others will serve as a source of reinfestation.

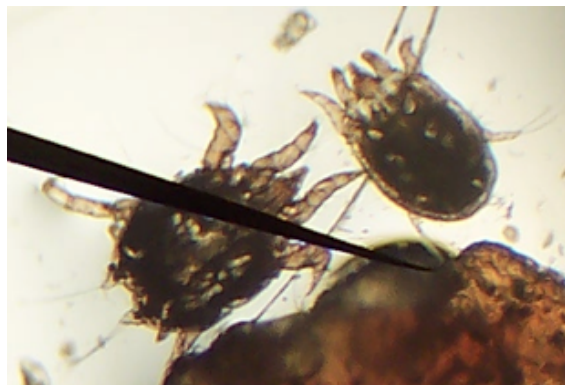
Psoroptes (equi) ovis

The genus has now been lumped into a single species although various populations of the mite are associated with specific areas of the body of specific host species.

Psoroptes is identified by the tarsal suckers on long jointed stalks; the body is oval with at least 3 pair of legs extending past body margins. The tarsal suckers are on long jointed stalks with the female suckers on legs 1,2 and 4, and long setae on leg 3. The male tarsal suckers are seen on legs 1, 2, and 3. All stages occur on host: adult → egg → larva → nymph with the

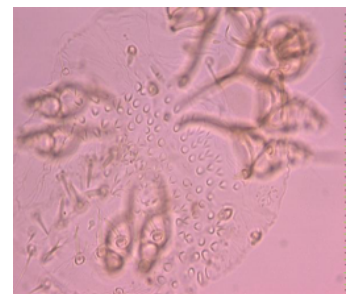
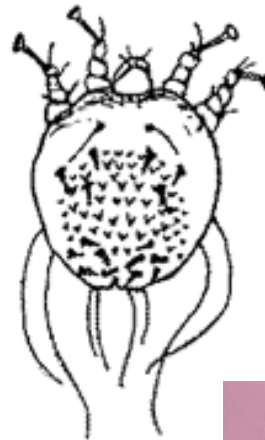
life cycle (egg to egg) 11 days with increased egg production in winter. Mites may survive off host for 15 20 days provided cool moist conditions.

Psoroptes (cuniculi) ovis is commonly found in ears of horses, goats and rabbits. There are extensive crusty scab formations in ear canal. In horses ears you may see white specks moving in brown exudate on the surface of the ear. Horses may have head sensitivity with swelling that becomes malodorous at base of ears.



Psoroptes (equi) ovis may be found under the mane, base of tail, axillae or between hind legs. It is a rare parasite and probably does not occur in North America. It is associated with pruritus and may be found by skin scraping.

Sarcoptes scabiei sarcoptic mange, scabies, scab is a member of the family Sarcoptoidea and is shared among a number of mammalian host species. *Sarcoptes* are round mites that live under keratin layers in epidermis. Coxae 1 and 2 are separate from coxae 3 and 4. On a dorsal view only legs 1 and 2 extending beyond body margin with long unsegmented bell stalks are seen. Legs 3 and 4 are short and stubby; do not extend beyond lateral margin of body. There are triangular scales on dorsum and a terminal anus.



Life Cycle/Biology

All life stages occur on host: adult → egg → larva → nymph; Egg to egg 3 weeks. They are more prevalent in cooler areas and during winter. The mites may survive off host for 15-20 days provided cool moist conditions. Populations of *Sarcoptes* are indistinguishable among those found on various hosts. They can colonize a different species of host causing pruritus but they cannot successfully breed on a host different from the one they are adapted to. Separate strains or races of *Sarcoptes* occur in dogs, man, horses, cattle, camels, llamas, swine, rabbits, foxes, sheep and goats.

Sarcoptes are tunneling mites and cause intense burning pruritus so the animal constantly rubs and scratches. The skin becomes thickened, dried and wrinkled. Scab formation occurs in infested areas due to self-mutilation from scratching and serum oozing from damaged skin and there is extensive alopecia. In the horse there is dry mange on sides, back, and shoulders and the mite may illicit pruritic response in handlers, “cavalryman’s itch.”

The suborder Trombidiformes or Prostigmata includes the family Demodicidae of which the genus *Demodex* spp. is well known in veterinary medicine but rarely encountered in equids.

Demodex are elongate cigar shaped mites with short stubby legs grouped toward anterior that live in hair follicles and sebaceous glands. They are common symbionts of many hosts so that disease is rare, but infection common. Demodectic mite species are host specific.

Two species of *Demodex* have been described in horses, *Demodex equi* on the body and *D. caballi* the eyes and muzzle. Both are extremely rare but can be associated with alopecia or formation of nodules where the mites are located. Sufficient numbers of mites so they can be found are often associated with long term corticosteroid treatment or other conditions affecting the horse’s immune system.

Trombiculidae is the family of mites commonly known as Chiggers. Chiggers are the larva of trombiculid mites over 40 genera found within the continental United States. Most are yellow to red in color (red bugs), have 3 pair of legs, often body and legs have many setae (hairy).

The salivary enzymes cause local dermatitis in man and other animals. Chiggers only feed for hours but the pruritus persists for days. Hypersensitive areas are easily invaded by secondary bacterial or fungal agents the nymphs and adults are free-living. They are most commonly active in early spring or fall. Harvest mite or red bug season varies geographically. The mites are easy to kill but damage already done pruritus with possibly papules may be seen. Usually the mites will have moved on by the time a skin scraping is done.

The Trombidiformes superfamily Pyemotoidea contains the genus *Pyemotes* (Straw or Forage Itch Mites). These mites usually feed on insects in hay, straw and grain and can opportunistically infest horse and handlers skin. Papules and wheals appear on the face and neck if horses are fed from a hay rack, and on the muzzle and legs if fed from the ground. Human infestation occurs where the feedstuff was carried.

Pruritus is variable and can be controlled with glucocorticoids. These mites are not truly parasitic but will attempt to get a meal when the opportunity presents itself. The salivary and excretory products of many arthropods contain common antigens and individual animals may become sensitized by one arthropod then show signs of allergy when encountering other species.

Diagnosis, Identification and Clinical Signs

Most mite infections are characterized by pruritus with hair loss in the affected area. The skin may also become thickened with papular eruptions. The skin may also become excoriated with serum oozing. Crusting may develop.

The skin lesions are due to the direct effects of the mites as well as trauma from the intense pruritus and resultant rubbing or scratching by the host.

Perform skin scrapings of the affected areas. Use low power objectives (10 to 30X) on microscope to identify mites.

Associated Diseases/Conditions

There are no known infectious diseases transmitted by mites in horses.

Treatment

Never use Amitraz on horses!

Psoroptes: Treatment with macrocyclic lactones such as ivermectin or eprinomectin should be quite effective against this mange mite and the widespread use of these drugs as anthelmintics has probably done much to lower the incidence of infestation.

Chorioptes: Both topical and injectable acaricides such as ivermectin, pour-on moxidectin, sprays with coumaphos or permethrin and topical products containing fipronil, usually used in small animals, have been used to treat horses.

However because the mites are surface feeders the systemic drugs are only partially effective in removing the mites from the host. Removing hair and skin debris in the infested area by clipping and shampooing may enhance the effectiveness of treatment. The fact that many horses do not show any signs of infestation and the mites or eggs can be transferred by grooming equipment makes it difficult to control unless all of the horses in the vicinity are treated.

Sarcoptes: Organophosphate insecticides or lime-sulfur solution can be used. These may require spraying, sponging, or dipping. Multiple treatments are recommended repeated at 12- to 14-day intervals at least 3–4 times. Oral administration of ivermectin or moxidectin at 200 µg/kg can also be used. Several treatments are required 2–3 wk apart. It is sometimes required that these treatments be used concurrently. It is also important to treat all the animals in direct contact.

Corticosteroids may be helpful to relieve signs and repellants help in protecting further infestation.

Never use Amitraz on horses!

Insecticide active ingredients labeled for topical application to control mites

Active ingredients and concentrations	Application options	Precautions
Permethrin 10% to 40%	Spray or wipe	Dilute before use
Pyrethrins 0.20%	Spray or wipe-on	

Check the product label for treatments intervals, application rates, and precautions prior to application.

Brush animals before treatment to remove dirt and dust which can reduce insecticide effectiveness.

Be familiar with pest feeding sites and thoroughly treat areas where the pests feed. Chorioptic mites cause leg mange of horses and usually are found in feathered area of fetlock on draft horses. *Psoroptes (cuniculi) ovis* is commonly found in ears of horses. *Sarcoptes* mites are tunneling mites and cause intense burning pruritus; there is dry mange on sides, back, and shoulders.

Removing all crusts, scales, and other skin debris before the application will increase the efficacy of control measures.

Select Ready-To-Use products with higher percentages of active ingredient for longer duration of protection or for more effective protection when pest pressure is high.

Some animals may be sensitive to ingredients any product, especially if the concentration of active ingredients is high. Reactions may include skin sensitivity, itchiness, rash and hair discoloration or hair loss at the application site. Bathe your horse with a mild, non-insecticidal shampoo and rinse with large amounts of water if you see signs of sensitivity. Contact your veterinarian immediately if the signs persist.

References

- Kettle DS. *Medical and Veterinary Entomology*. C.A.B International, Wallingford, UK, 1990
- Kaufman PE, PG Koehler, JF Butler. *External parasites on horses*. University Florida Extension ENY-283 Mar 2013
- Kunkle GA, EC Greiner. *Dermatitis in horses and man caused by the straw itch mite*. JAVMA 181:467-469 1982
- Lossom BL, B Mignon. *Mange Horses*, Merck Manual 2011
- Pugh DG, XP Hu, KH Bourke. *Control of chorioptic mange mites on horses, donkeys, and mules*. Alabama Coop Extension ANR-1444 Feb 2013
- Rendele DI, HJ Cottle, S Love, KJ Hughes. *Comparitive study of doramectin and fipronil in the treatment of equine chorioptic mange*. Vet Rec 161:335-338 2007
- Rufenacht S, SJ Roosje, H Sager et al. *Combined moxidectin and environmental therapy do not eliminate Chorioptes bovis infestation in heavily feathered horses*. Vet Dermatol 22:17-23 2011
- Ural K, B Ulutas, S Kar. *Eprinomectin treatment of psoroptic mange in hunter/jumper and dressage horses: a prospective, randomized, double-blinded, placebo-controlled clinical trial*. Vet Parasitol 156:353-357 2008