

Popular Article

Dermatophytosis in horses

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Abstract

Dermatophytes are found to be most frequent causes of dermatological problems in horses, belong to the class Ascomycetes, normally invade in the stratum corneum, hair shaft, or hoof. A couples of zoophilic (*M. canis*, *T. mentagrophytes*, *T. equinum*, and *T. verrucosum*), geophilic (*M. gypseum*), and anthropophilic dermatophytes (*M. equinum* and *T. equinum*) are reported to frequently cause dermatophytosis in horses. Equine dermatophytosis has considerable zoonotic importance as animals serve as reservoirs for the zoophilic dermatophytes especially members of the *Microsporum* spp. and *Trichophyton* genera and their infections. The clinical signs of fungal infections are variable and may include alopecia, crusts, papules, pruritus, nodules, ulcers, and draining tracts. Treatment is dependent on the organism cultured and may include both topical and/or systemic treatment.

Introduction

Dermatophytosis is one of the commonly found fungal skin diseases affecting horses. It is a extreme contagious fungal infection of the skin that affects horses of all ages. *Trichophyton equinum*, *M. equinum*, *T. mentagrophytes*, and *T. verrucosum* are the most commonly found equine dermatophytes that isolated from horse skin. The fungi live vegetative in the soil and cause disease to animals that dig, roll, and lie down in soil. A number of these fungi can be transmitted from horses to humans. A variety of lesions are found in the axillary/girth area first, and then spread throughout the trunk, rump, neck, head, and limbs. The lesions may be superficial or deep in nature. It is much more common for superficial infections to develop thick crusts, or to develop diffuse moth-eaten appearance with desquamation and alopecia, sometimes in a "ring" pattern, as well as desquamation. The initial lesions may be very urticarial in nature, progressing to multiple focal areas of alopecia and scaling. Generally, the fungal infection occurs on the hair and epidermis of the horse. Otherwise, healthy horses rarely contract it. Transmission between horses occurs due to source of contaminated material. Biting flies can transmit the *Microsporum* spp.

Etiology

There are two main genera of fungi that commonly infect the horses-

- 1) Most commonly involved: *Trichophyton equinum* *Trichophyton* spp (*T. equinum* var. *equinum* and *T. equinum* var *autotrophicum*). *Trichophyton mentagrophytes* *Trichophyton* spp (*Arthroderma vanbreuseghemii*).
- 2) *Microsporum* (the commonest species are *M. gypseum* and *M. equinum*)

1. Predisposing factors

- Poor hygiene
- Damaged (traumatized) skin, although only slight damage may be required due to tack rubbing or ectoparasites. Predilection sites of fungal infection on around the girth, on the sides of the neck and in rug contact points on the body.
- Overcrowded, warm damp stables.
- Exposure to asymptomatic horses that can function as carriers.
- Immunocompromised horses and horses treated with glucocorticoids are most prone to the disease.
- More rarely spread of spores occurs in a vehicle, communal wash buckets or contaminated body brushes etc.

2. Spread to infection

Infected individuals, stalls, grooming tools, and contaminated objects, broken hairs with associated spores are important sources of the disease's spread. Infections do not always result from contact. A fungal infection is determined by many factors, including the animal's age, health, the condition of exposed skin surfaces, grooming behavior, and nutrition.

3. Time-course

- Incubation 4-30 days.
- Lesions may continue to spread across the body depending on hair stage and individual immunity, spontaneous remission usually occurs in 1-4 months in immunocompetent subjects.

4. Morphology of *Trichophyton verrucosum*

The colonies of the case isolates were slow growing attaining a 9–11 mm diameter after 1 month on SDA (13–20 mm after 3 months). Colonies are cream colored, waxy and slightly elevated in the center, later becoming slightly lanuginous in some areas. The intensive submerged growth at marginal parts with dendritic branching of submerged mycelium are seen.

On microscopic examination, the presence of intensely septate vegetative hyphae with an apparent fragmentation are found. There are numerous thick-walled, intercalar and terminal chlamydospores, frequently in chains. Chlamydospores are found to be mainly globose, subglobose or elliptical with irregular shape.

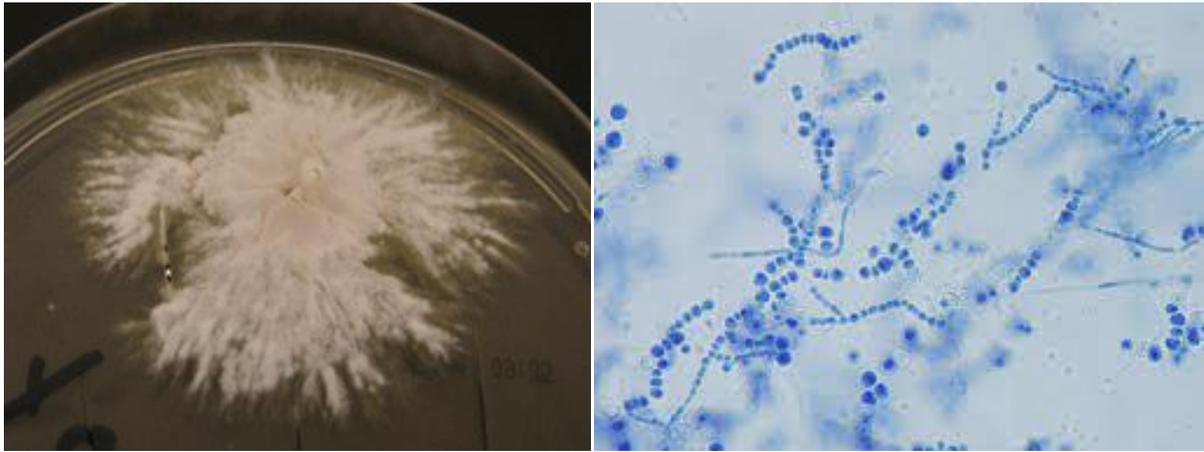


Figure 1: Macroscopic and Microscopic characterization of *Trychophyton verrucosum*

5. Morphology of *Microsporum gypseum*

Microsporum gypseum grows relatively rapidly and matures in 6 to 10 days. Colony generally described as yellow buff to a dark cream or cinnamon brown colour. The colony may develop a sterile white feathered hyphal border or a cottony white raised center, powdery to granular colony. Reverse may be yellow, orange-tan or brownish red in colour with possible pink to purplish tinges. The texture of the colony is powdery to granular and the color is beige to cinnamon brown. From the reverse, it is yellow to brownish red. Septate hyphae along with sessile or stalked clavate (club shaped) microconidia shows microscopically. The fusiform (spindle shaped) macroconidia are found to be symmetrical in shape with rounded ends. The walls of macroconidia are thin and rough and they contain 3-6 cells. Microconidia are moderately numerous in number, club-shaped and located along the hyphae.

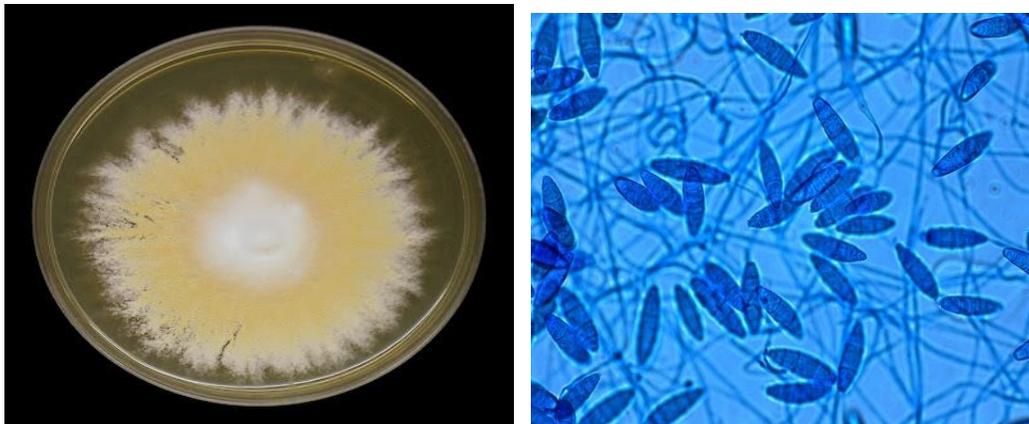


Figure 2: Macroscopic and Microscopic characterization of *Microsporum gypseum*

6. Clinical signs

The first sign of infection is modification in angle of the hair shaft; this causes small (often circular) (5–20 mm diameter) patches of hair to stick up against the lie of the coat. In amongst the hair shafts fine accumulation of keratinized squamae's cause an accumulation of cigarette ash-like

particles in the hair. Keratolytic enzymes, produced by the fungus, cause weakening of the hairs, which break and fall out, leaving bald areas with a scaling surface. There are usually no pruriginous lesions, and kerion and miliary dermatitis can also appear, spreading rapidly from the saddle and girth to the body. Infected animals will develop circular, bald, scaly patches with broken hair. *Microsporum* species tend to produce a smaller lesion with less weakening of the hair shafts. It may not affect all the hairs equally, however *Trichophyton* lesions that are easily plucked leaving an totally hairless area, these lesion are sometimes painful and resented. In these cases, entire scabs of matted hair and exudate are often pulled away, leaving an oozing wet skin surface. There are several areas where ringworm can be found, including the girth, saddle, flanks, chest, and head. Most lesions are found in the saddle and girth ("girth itch"). Healing started from the centre centrifugally, so that active fungal growths are at the margins of the lesion.

7. Diagnosis

Laboratory diagnosis consists in the direct microscopic examination of the clinical sample, and in particular of endo and/or ectothrix arthroconidia followed by in vitro culture. Hairs at the periphery of the lesion should be plucked with forceps for microscopy. Cutting off the tops of hairs is not helpful as the spores live in the base of the hair follicle. Skin scrapings should be taken from any lesions that have already become alopecic. Colonies grown onto Sabaroud dextrose agar supplemented with chloramphenicol 0.05 g/l are identified to species level based on their macromorphology as well as of the microscopic characteristics of the hyphae, macroconidia and micro-conidia. For clear diagnosis of *T. verrucosum*, a molecular diagnosis may be required. Horse dermatophytosis usually resolves spontaneously within 1–4 months. however, the treatment is mandatory due to zoonotic and contagious nature of this disease.

8. Treatment

The treatment of choice is whole body, leave-on rinses with lime sulfur 1:16 or enilconazole 1:100, twice in week. Bleach should not be used because it may be irritating and a human health hazard. Topical adjuvant treatment on non-rinse days may be used. Effective products include enilconazole in a spray form (stable for 7 days) or a spray formulation of 2% chlorhexidine/1% ketoconazole or 2% chlorhexidine/1%–2% miconazole. Lesions around the eyes should be treated with 1–2% miconazole cream once daily. The treatment should be continued for 2–4 weeks after clinical resolution. Etoconazole and Hypochlorite bleach sprays may be used for environment decontamination. Infected animals should be kept isolated. Tack should be thoroughly cleaned by first removing gross organic debris and then washing thoroughly with a detergent soap.

9. Prevention and control

- Maintenance of proper hygiene limits the spread of *Trichophyton*.
- Proper and good ventilation can reduce contracting dermatophytes infection such as Athletes foot, which requires wearing cotton socks and well-ventilated footwear.
- Disinfection can be accomplished with any over-the-counter bathroom cleaner labeled as antifungal for *Trichophyton* spp.
- Fabric leads or blankets should be washed twice in a washing machine.