THE SCIENCE WORLD
A Monthly e Magazine
ISSN:2583-2212
June, 2025 Vol.5(6), 7453-7456

Popular Article

Dermatitis by Malassezia pachydermatis: An Opportunistic yeast

C Christen[1], J B Rajesh[2]*, Jashima Debbarma[3], Payel Kar[4], Nitin Kumar[5], Yashaswi Athreya[6]
[1,3,4,5]MVSc scholar, Department of Veterinary Medicine, College of Veterinary Sciences and Animal Husbandry, Central Agricultural University (I), Selesih PO, Aizawl, Mizoram: 796015
[2]Assistant Professor (SG), Department of Veterinary Medicine, College of Veterinary Sciences and Animal Husbandry, Central Agricultural University (I), Selesih PO, Aizawl, Mizoram: 796015
[6]MVSc scholar, Department of Animal Nutrition, College of Veterinary Sciences and Animal Husbandry, Central Agricultural University (I), Selesih PO, Aizawl, Mizoram: 796015
DOI:10.5281/ScienceWorld.15773574

Introduction

The term "dermatitis" is often believed to come from an ancient Greek word that means "inflammation of the skin" (with "derma-" referring to skin and "-itis" referring to inflammation) (Braun-Falco *et al*., 2000). It's a common condition and often expensive to manage in pet animals especially cats and dogs. One of the reasons for dermatitis in dogs and cats is *Malassezia pachydermatis* a fungus and it is frequently incriminated as the causative agent for dermatitis. Louis Charles Malassez was the first person who separated this yeast from single cell fungi called as "saccharomycese" from the previously included fungus with in dermatophyte complex (Bond *et al*., 2020).

Etiology

Malassezia pachydermatis usually present in the external canal and superficial muco-cutaneous site in dogs. Round to oval or peanut shape with monopolar budding (reproduce buds from one buds). It is a lipophilic, non-lipid-dependent yeast organism often associated with *Malassezia* dermatitis in dogs. Other pathogens are unlikely common in dogs such as *M. sympodialis* which are comparatively smaller than *Malassezia pachydermatis*. *M. sympodialis* are rounded bulbous in shape and having narrow–based monopolar budding (Miller *et al*., 2013).

The genus *Malassezia* contains 14 recognized species and most of them causes illness in humans too. Important *Malassezia* species causing disease in animals (Cabanes, 2014) are summarised below.

Malassezia Species	Primary Animal Hosts
M. pachydermatis	Dog, cat, carnivores, birds
M. caprae	Goat, horse
M. equina	Horse, cow
M. cuniculi	Rabbit
M. dermatis	Pig, goat, sheep
M. nana	Cat, cow, dog

All of this yeast can colonize or infect humans and animals.

Epidemiology

Malassezia pachydermatis is a commensal yeast commonly found in the external ear canal, perianal region, and skin of healthy dogs. It becomes pathogenic when the host's skin barrier is compromised, often due to allergies, hormonal disorders, or increased humidity. Prevalence is higher in warm, humid climates and the occurrence is more in certain breeds like Basset Hounds, West Highland White Terriers, and Cocker Spaniels (Cafarchia *et al*., 2011). Environmental factors such as seasonal variation, poor hygiene, and frequent bathing with inappropriate shampoos may also contribute to the overgrowth of *Malassezia* (Bond *et al*., 2020).

Transmission

Malassezia pachydermatis is typically an endogenous organism, meaning it originates from the dog's own flora. However, direct transmission through close contact with infected animals or shared with grooming tools, bedding, or environments may also occur, especially in kennels or multi-dog households (Bond *et al*., 2020). Although not zoonotic in most cases, there have been rare instances of transmission to immunocompromised humans, especially those in close contact with infected pets (Cafarchia *et al*., 2011).

Pathogenesis

Malassezia species causes disease in the outer skin layer (stratum corneum) or mucosal surfaces, which can trigger or initiate ear or skin problems. Usually when the delicate balance between the yeast's pathogenic potential and the dog's immune defenses is compromised, they grow excessively. Certain conditions such as increased oiliness (seborrhea), high humidity, or weakened immune defenses leads to the growth of these yeasts excessively. The yeast's outer layer (cell wall) contains compounds like mannans (types of complex sugars) and lipases (enzymes that break down fats), which can harm the skin barrier and activate the immune system, leading to inflammation (which causes redness, swelling, and itching). These immune responses may get worsen the irritation and lead to clinical symptoms of infection. The yeast can multiply rapidly due to either favourable environmental factor (such as heat and humidity). In healthy dogs, *M. pachydermatis* commonly colonizes in areas such as the skin around the mouth, the chin, lips, spaces between the toes, the skin around the anus, and the anal mucosa (Kennis *et al*., 1996). Some studies found that the dogs that had

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Published 29 /06/2025

the *Leishmania infantum* infection had a higher amount of *M. pachydermatis* growing on their skin than the dogs that didn't have the infection (Cafarchia *et al*., 2008a; Cafarchia *et al*., 2008b).

Clinical sign

The main clinical sign observed are alopecia, pruritus, erythema, hyperpigmentation, lichenification, epidermal collarettes, pustules, vesicles and nodules in dogs afflicted with *Malassezia pachydermatis*. In the early stages of infection, pruritus of variable intensity, erythema, alopecia, papules, macules and scaly lesions were noticed in the present study. On other hand hyperpigmentation, lichenification and other secondary lesions were noticed in chronic cases due to scratching (Rakesh *et al*., 2023).

Diagnosis

Microscopic examination of skin scrapings, after staining with special dyes like Diff-Quik, *Malassezia* yeasts can be grown or cultured on various types of laboratory media (modified Dixon's agar or Sabouraud's dextrose agar (SDA)). To identify these *Malassezia* species, there are phenotypic and genotypic methods. For the phenotypic method utilises the growth pattern in SDA or special media like Leeming-Notman agar, Dixon agar, and even Chrom *Malassezia* agar. Genotypic method comprises of molecular techniques like PFGE, RAPD, AFLP, DGGE, and DNA sequencing to get a proper ID (Böhmová *et al*., 2018).

Treatment

Topical therapy for *Malassezia* dermatitis is with 2% miconazole nitrate + 2% chlorhexidine applied twice weekly for 3 weeks. Use of systemic antifungal treatments using azole derivatives: ketoconazole (10 mg/kg/day) and itraconazole (5 mg/kg/day), both administered for 3 weeks (Negre, *et al*., 2009).

Yeast ear infections, or ear otitis caused by *Malassezia*, often begin with itching and a waxy, smelly discharge. Cleaning is the first step. A gentle ear wash removes dirt and build-up, which helps the medicine to reach deeper into the canal. After that, cleaning with ear solutions containing miconazole or clotrimazole can applied. This will destroy the yeast living in the ear.

Sometimes, ear infections get chronic especially when the ear is swollen or too painful to touch. In such cases tablets or syrups also should be given instead of giving only ear drops. It's helpful when the infection keeps coming back or doesn't improve with regular treatment. Medicines such as itraconazole or fluconazole are prescribed depending on how bad the infection is. Regular blood monitoring may be needed if used for a long time.

Prevention

1. Routine ear checks, especially for dogs with floppy ears or skin allergies, help prevent flare-ups.

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2. Dogs can keep getting ear infections if they have allergies or if their ears stay damp too often. One way to prevent this is by keeping the ears dry.
3. Don't give too many baths, and use a mild shampoo made for pets
4. Give nutritious diet
5. If dog is shaking its head a lot or always scratching the ears detailed veterinarian's check-up is recommended.

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