

EFFECTIVENESS OF APPLE CIDER VINEGAR AS A TREATMENT OF SCABIOSIS, MALASSEZIOSIS, COMPLICATED BY OTITIS EXTERNA IN A DOMESTIC CAT

Efektivitas Cuka Apel sebagai Pengobatan Scabiosis dan Malasseziosis, dengan Komplikasi Otitis Eksterna pada Kucing Domestik

Hasby Faizul Qodri^{1*}, Putu Devi Jayanti², I Gusti Made Krisna Erawan³

¹Professional Veterinary Medicine Student, Faculty of Veterinary Medicine, Udayana University, Jl. PB Sudirman, Denpasar, Bali, 80234, Indonesia

²Laboratory of Veterinary Internal Medicine, Faculty of Veterinary Medicine, Udayana University, Jl. PB Sudirman, Denpasar, Bali, 80234, Indonesia

*Corresponding author email: hasbyqodri7@gmail.com

How to cite: Qodri HF, Jayanti PD, Erawan IGMK. 2026. Effectiveness of apple cider vinegar as a treatment of scabiosis, malasseziosis, complicated by otitis externa in domestic cats. *Bul. Vet. Udayana*. 18(2): 477-489. DOI: <https://doi.org/10.24843/bulvet.2026.v18.i02.p12>

Abstract

Apple cider vinegar is a natural substance containing acetic acid, polyphenols, vitamins, and minerals with antimicrobial, antiparasitic, and anti-inflammatory properties, making it potentially useful as a therapeutic agent for animal skin diseases. This article reports a 3-year-old domestic cat presenting with crusting, alopecia, swelling on the left anterior region of the mouth accompanied by mild hypersalivation, and the presence of moist yellow ear discharge. Supporting examinations were performed using skin scraping, native otic swab, cytological otic swab, and acetate tape preparation methods. Based on the history, clinical findings, and supporting examinations, the cat was diagnosed with scabiosis, malasseziosis, and otitis externa. The therapy administered consisted of both causative and supportive treatments. For scabiosis and malasseziosis, apple cider vinegar was used as a natural topical antimicrobial agent. The use of apple cider vinegar as a topical antimicrobial agent showed effective results in reducing the clinical signs of scabiosis and malasseziosis, characterized by improvement in skin condition and reduction of lesions within 7 days. Otitis externa was treated topically using Oridermyl[®] ointment administered once daily for 7 days. In addition, fish oil capsules were administered orally as supportive therapy to nourish the skin and enhance the immune system. Evaluation over a 7-day period demonstrated a reduction in crusting, alopecia, and hypersalivation, resolution of swelling in the left anterior region of the mouth, as well as decreased moist yellow ear discharge.

Keywords: apple cider vinegar; cats; scabiosis; malasseziosis; otitis externa

Abstrak

Cuka apel merupakan bahan alami yang mengandung asam asetat, polifenol, vitamin, dan

mineral dengan sifat antimikroba, antiparasit, dan antiinflamasi sehingga berpotensi digunakan sebagai terapi pada penyakit kulit hewan. Artikel ini melaporkan seekor kucing domestik berumur 3 tahun yang menunjukkan gejala krusta, alopesia, pembengkakan pada mulut bagian depan kiri disertai hipersalivasi ringan, serta adanya kotoran berwarna kuning lembap pada telinga. Pemeriksaan penunjang dilakukan dengan metode *skin scraping*, *otic swab* natif, *otic swab sitologi*, dan *acetate tape preparation*. Berdasarkan anamnesis, temuan klinis, dan pemeriksaan penunjang, kucing kasus didiagnosis mengalami scabiosis, malasseziosis dan otitis eksterna. Terapi yang diberikan bersifat kausatif dan suportif. Untuk scabiosis dan malasseziosis, digunakan cuka apel sebagai agen antimikroba topikal alami. Penggunaan cuka apel sebagai agen antimikroba topikal menunjukkan hasil yang efektif dalam mengurangi gejala klinis scabiosis dan malasseziosis, ditandai dengan perbaikan kondisi kulit dan berkurangnya lesi dalam waktu 7 hari. Pengobatan otitis eksterna dilakukan secara topikal menggunakan salep Oridermyl® yang diberikan sekali sehari selama 7 hari. Selain itu, diberikan *fish oil caps* secara oral sebagai terapi suportif untuk nutrisi kulit dan meningkatkan kekebalan tubuh. Evaluasi selama 7 hari menunjukkan berkurangnya krusta, alopesia, hipersalivasi, kesembuhan pembengkakan pada mulut bagian depan kiri, serta berkurangnya kotoran berwarna kuning dan lembap pada telinga.

Kata kunci: cuka apel; kucing; scabiosis; malasseziosis; otitis eksterna

INTRODUCTION

Scabiosis is a disease caused by various species of mites and is zoonotic in nature. The causative mites belong to the arthropod group, specifically the class Arachnida, subclass Acarina, order Astigmata, and family Sarcoptidae (Arlian & Morgan, 2017). In cats, scabiosis may be caused by *Notoedres cati* (*N. cati*) and *Sarcoptes scabiei* (*S. scabiei*). *S. scabiei* and *N. cati* mites can be differentiated based on their size, with *N. cati* being smaller than *S. scabiei*. *S. scabiei* mites inhabit the keratinized layer of the skin (stratum corneum) and feed on cellular fluids. These mites burrow only into the superficial layer of the skin and do not penetrate beneath the stratum corneum (Arlian & Morgan, 2017). In contrast, *N. cati* mites inhabit the superficial epidermal layer, particularly in the head and ear regions of cats (Györke *et al.*, 2022). Mite infestation within these skin layers may disrupt the normal skin microflora, thereby triggering excessive growth of fungi such as *Malassezia* sp.

The skin of domestic cats is colonized by various yeast species of *Malassezia*. The non-lipid-dependent species *Malassezia pachydermatis* (*M. pachydermatis*) is the most commonly identified, whereas lipid-dependent species isolated from cats include *Malassezia sympodialis*, *Malassezia globosa*, *Malassezia furfur*, *Malassezia slooffiae*, and, more recently, *Malassezia slooffiae* (Drmedvet *et al.*, 2010). *M. pachydermatis* has been regarded as a zoophilic yeast because it is frequently isolated from both wild and domestic animals, particularly dogs and cats. In dogs and cats, *M. pachydermatis* colonizes the skin shortly after birth and is the primary fungal species associated with skin and ear diseases. *Malassezia* constitutes part of the normal skin flora in healthy dogs and cats, with the primary colonization sites being the mucocutaneous areas, ears, and interdigital regions. However, under certain conditions, the yeast may proliferate and reproduce excessively, resulting in clinical disease (Çomak & Ceylan, 2018). Overgrowth of *Malassezia* on the skin, particularly in the external ear region, frequently contributes to the development of otitis externa in cats.

Otitis is an inflammatory condition affecting the ear, specifically the ear canal. Inflammation of the ear can be classified according to the location of the inflammatory process, including otitis media, otitis interna, and otitis externa. Otitis media is inflammation occurring within the middle ear cavity and is generally associated with processes that remain poorly understood in

most veterinary practices (Gotthelf, 2004). In contrast, otitis interna involves damage to the inner part of the auditory system and is often accompanied by neurological signs, impaired hearing ability, and may even result in deafness (Kennis, 2013). Otitis externa is defined as inflammation of the external ear canal. This inflammatory condition is commonly caused by colonization of microorganisms such as bacteria, fungi, and parasites. Infestation with *Otodectes cynotis* (*O. cynotis*) is the most common cause, accounting for approximately 50% to 84% of all otitis externa cases in cats (Sotiraki *et al.*, 2001).

The use of natural substances as alternative therapies for skin diseases has gained increasing attention, one of which is apple cider vinegar. Apple cider vinegar is known to possess therapeutic potential in various skin disorders, including dermatitis, due to its content of acetic acid, polyphenols, vitamins, and minerals that exhibit antimicrobial, antiparasitic, and anti-inflammatory properties (Aykin *et al.*, 2014). Several studies have reported the effectiveness of apple cider vinegar in cases of dermatitis and fungal infections by inhibiting microbial growth (Yagnik *et al.*, 2018). The acetic acid content in apple cider vinegar is capable of creating a skin pH environment that is less favorable for the growth of fungi and bacteria, including *M. pachydermatis*, and may also help dissolve crusts or debris on the skin (Aarestrup *et al.*, 2003).

This case report describes the management of a three-year-old local cat diagnosed with scabiosis, malasseziosis, and bilateral otitis externa, treated using a combination of pharmacological and non-pharmacological therapies. This report is expected to provide an additional reference regarding the use of apple cider vinegar as a non-pharmacological therapy for scabiosis and malasseziosis, accompanied by pharmacological management of otitis externa in domestic cats.

RESEARCH METHODS

Signalment and History

The case cat, named Mici, was a 3-year-old female domestic short-haired cat weighing 1.9 kg with a tabby coat color. The cat had been missing from home for approximately three weeks prior to examination. The owner found the cat with alopecia, crusting, and excessive yellow ear discharge affecting the head, face, neck, and external auricular regions. The cat appeared lethargic and depressed. The cat was raised in a free-roaming system outside the house. The case cat was reported to have normal eating and drinking habits and was fed dry food. Defecation and urination were also normal. The cat had never received vaccination or deworming treatment and had never been bathed. Since being found, the cat had not received any medication or special treatment.

Physical Examination

Examination of the case cat was conducted at the Laboratory of Veterinary Internal Medicine, Faculty of Veterinary Medicine, Udayana University. Physical examination was performed systematically. Prior to the physical examination, the vital parameters evaluated included heart rate, pulse rate, capillary refill time, respiration rate, and body temperature. Heart rate was measured through auscultation using a stethoscope on the thoracic area, whereas pulse rate was assessed by palpation of the femoral artery. These two parameters were differentiated because heart rate reflects cardiac activity, while pulse rate indicates peripheral blood flow, although under normal conditions both generally have similar values. Differences between the results may occur under certain conditions such as arrhythmia or pulse deficit and may also be influenced by technical factors and differences in examination timing. The physical examination was subsequently performed from head to tail using inspection, palpation, auscultation, and percussion methods.

Skin Scraping Examination

In this case, skin examination was performed using the superficial skin scraping method. Sample collection was carried out by applying baby oil to the area to be scraped, followed by scraping with a blade until the crusts were removed. The crusts attached to the blade were placed on an object glass and added with 10% KOH solution. The preparation was then covered with a cover glass and observed under a microscope at 100× magnification (Saridomichelakis & Koutinas, 2014).

Otic Swab Examination

In this case, the otic swab method was performed by collecting ear cerumen using a cotton bud coated with baby oil, and the swab sample was rolled onto an object glass. The preparation was then covered with a cover glass and observed under a microscope at 10× and 40× magnification (Trajano *et al.*, 2020).

Cytological Otic Swab Examination

Cytological examination of ear cerumen was performed by swabbing the ear using a cotton bud, after which the swab sample was rolled onto an object glass. The sample was subsequently stained using Eosin and Methylene Blue with the Diff-Quick method. The obtained sample was examined under a microscope at 10× and 40× magnification (Trajano *et al.*, 2020).

Acetate Tape Preparation (ATP) Examination

Sample collection was performed using the skin tape method on skin areas showing erythema, alopecia, and seborrhea. The tape was then attached to an object glass, fixed with methanol, and stained using Eosin and Methylene Blue with the Diff-Quick method. The samples were subsequently examined under a microscope at 1000× magnification (Trajano *et al.*, 2020).

RESULTS AND DISCUSSION

Results

Physical Examination

On physical examination, the case cat showed a heart rate of 81 beats per minute, pulse rate of 80 beats per minute, capillary refill time (CRT) of less than 2 seconds, and a rectal temperature of 38.6°C. Examination of the skin and claws revealed hair loss and a dull hair coat, with crusts observed on the lateral facial region, external auricular area, head, back, and the dorsal thoracic, lumbar, and sacral regions. The distribution of lesions in the case cat is presented in Figure 1. Swelling was observed on the left anterior region of the mouth accompanied by mild hypersalivation. In addition, the ears contained moist yellow discharge (Figure 2).

Skin Scraping Examination

The results of skin examination using the superficial skin scraping method revealed the presence of round, flattened parasites with eight short legs and the anus located posteriorly. These findings were identified as *S. scabiei*. The microscopic appearance of *S. scabiei* mites is shown in Figure 3.

Otic Swab Examination

Examination of ear cerumen using the otic swab method revealed oval-shaped parasites with eight long legs, a flattened body, and the anus located dorsally. Based on these morphological characteristics, the parasites were identified as *O. cynotis*. The microscopic appearance is presented in Figure 3.

Cytological Otic Swab Examination

Cytological otic swab examination using Diff-Quick staining demonstrated the presence of round to oval organisms with thick cell walls and monopolar budding. These agents were identified as *Malassezia* sp. The microscopic appearance of *Malassezia* sp. in the cytological otic swab examination is shown in Figure 3.

Acetate Tape Preparation (ATP) Examination

ATP examination of skin areas showing alopecia and erythema revealed infestation by *Malassezia* sp., with approximately 10–15 organisms observed per field of view at 1000× magnification. These findings are presented in Figure 3.

Diagnosis and Prognosis

Based on the history, physical examination findings, and supporting examinations, the case cat was diagnosed with scabiosis, malasseziosis, and otitis externa with a *fausta* prognosis.

Therapy

The therapy administered in this case consisted of causative and supportive treatments. The case cat diagnosed with scabiosis and malasseziosis was treated using apple cider vinegar applied twice daily for 7 days. Commercial apple cider vinegar containing approximately 5% acetic acid was diluted with distilled water at a ratio of 1:1 to obtain a final concentration of approximately 2.5%, and the solution was then transferred into a 50 mL spray bottle to facilitate application. Prior to spraying, the infected skin area was first cleaned using sterile wet tissue to remove crusts and debris from the skin surface. After the lesion area was clean and dry, the apple cider vinegar solution was sprayed onto sterile cotton, which was then gently and evenly applied to the skin lesions affected by mite infestation and *Malassezia* overgrowth.

For the treatment of otitis, Oridermyl[®] ointment (Vetoquinol[®], Magny, Vernois 70200 LURE, France) was administered once daily for 7 days. The ointment contains permethrin (antiparasitic), neomycin sulfate (antibiotic), nystatin (antifungal), and triamcinolone acetonide (anti-inflammatory). The case animal also received supportive therapy in the form of fish oil capsules administered every 24 hours at a dose of one capsule for seven days to help improve the immune system and nourish the hair follicles.

Evaluation

Clinical evaluation over seven days demonstrated gradual improvement in the condition of the case cat. Crusting began to decrease on day 3 and continued to decline until day 7, when crusts were no longer observed. The progression of the healing process during the treatment period is presented in Table 2. At the end of the evaluation period, the skin lesions showed marked improvement, characterized by reduced alopecia and cleaner skin condition. In addition, the ear condition appeared improved with decreased cerumen accumulation and reduced moisture. The condition of the cat after therapy is presented in Figure 4, while the results of supporting examinations after therapy are shown in Figures 5 and 6.

Discussion

Based on the history and clinical findings from the physical examination, the case cat exhibited alopecia, crusting, and skin thickening (hyperkeratosis) in the ear region. These signs were consistent with the clinical presentation of scabiosis, a skin disease caused by mites of the family Sarcoptidae, such as *S. scabiei* and *N. cati* (Suryaningrat *et al.*, 2024). Scabiosis in cats is characterized by excessive pruritus, dry skin, and crust formation, which generally appear on the inner aspect of the pinna auricularis (medial side of the auricular pinna) and may spread across the

entire ear surface, head, and neck. The infected skin areas commonly develop thickening, lichenification, hair loss (alopecia), crust formation, and excoriations due to scratching. If left untreated, the lesions may spread throughout the body and result in anorexia, severe weight loss (emaciation), and secondary infections (Trajano *et al.*, 2020). The results of the superficial skin scraping examination supported the diagnosis of scabiosis through the identification of *Sarcoptidae* sp. mites.

The ATP examination results demonstrated that the cat was infected with *Malassezia*, a genus of lipophilic fungi that constitutes part of the normal skin flora in animals, including cats. Under normal conditions, *Malassezia* does not cause disease; however, it may become pathogenic when skin homeostasis is disrupted. In the present case, severe scabiosis caused skin damage and chronic pruritus, thereby creating an environment conducive to excessive *Malassezia* proliferation. This finding is consistent with the statement of Trajano *et al.* (2020), who reported that *Malassezia* infections are frequently triggered by predisposing factors such as concurrent skin diseases or immune disorders and are exacerbated by poor environmental hygiene and inadequate animal care. Thus, the condition observed in the case cat corresponds to this mechanism, in which scabiosis acted as the primary factor disrupting the balance of skin microflora, while poor environmental hygiene further aggravated the condition, resulting in secondary *Malassezia* infection. Mixed infections such as this are commonly encountered in small animal dermatological cases and indicate that one skin disease may predispose the animal to additional infections that worsen the clinical manifestations.

In addition to these primary dermatological manifestations, physical examination also revealed mild swelling of the left anterior lip accompanied by hypersalivation. These findings were not considered primary signs of scabiosis, malasseziosis, or otitis externa, but rather secondary complications. *S. scabiei* infestation induces severe pruritus and skin inflammation, prompting the cat to scratch and lick the affected areas excessively, which may lead to soft tissue trauma and edema of the lips (Malik *et al.*, 2006). Furthermore, otitis externa caused by *O. cynotis* and *Malassezia* may produce pain radiating to the orofacial region, thereby triggering tissue swelling and mild hypersalivation as pain and stress responses (Hiblu *et al.*, 2020). These signs gradually improved along with the resolution of skin and ear lesions following therapy, supporting the assumption that the condition was secondary in nature rather than a primary oral cavity disorder.

Treatment of scabiosis and malasseziosis in cats generally involves the use of conventional antiparasitic and antifungal agents. However, these medications may potentially cause adverse effects and contribute to resistance when used inappropriately (Terms, 2014; Chatterji *et al.*, 2011; Simab *et al.*, 2022). Therefore, in this case, apple cider vinegar was used as an alternative topical therapy considered to be safer. Apple cider vinegar is a fermented apple product containing acetic acid, polyphenols, and flavonoids with antiparasitic, antifungal, and anti-inflammatory activities (Apple & Vinegar, 2024). Acetic acid disrupts the lipid membrane integrity of *S. scabiei*, causing dehydration and mite death, while also lowering skin pH, thereby inhibiting parasite development Yang *et al.* (2023). In *Malassezia* infections, acetic acid increases fungal cell membrane permeability and inhibits fungal growth (Godinho *et al.*, 2018).

Before therapy, the cat exhibited lesions in the form of alopecia and crusting, particularly in the head and neck regions, consistent with the clinical presentation of scabiosis and malasseziosis (Malik, 2006). After seven days of therapy, clinical improvement was observed, including reduced alopecia and crusting as well as cleaner skin condition. These findings are in accordance with the report of Mieszkina *et al.* (2017) regarding the effectiveness of acetic acid against ectoparasites and skin fungi. Nevertheless, scientific evidence regarding the specific effectiveness of apple cider vinegar against *S. scabiei* and *Malassezia* infections in cats remains limited, with most reports originating from in vitro studies or dermatophytosis cases (Chandraseharan *et al.*, 2023). In addition, the limitations of this case report include the absence of a control test and the use of combination therapy (apple cider

vinegar, topical ointment, and supplements), such that the observed clinical improvement was multifactorial and cannot be fully attributed solely to the use of apple cider vinegar. Therefore, the use of apple cider vinegar in this case was categorized as an exploratory alternative therapy. During treatment, no adverse effects were observed, indicating that apple cider vinegar is relatively safe for topical use when properly applied.

Another clinical finding in this case was otitis externa. The case cat exhibited moist yellow cerumen accompanied by an unpleasant odor. These findings are consistent with the statement of Hiblu *et al.* (2020), who reported that otitis externa is characterized by excessive cerumen production, unpleasant odor, swelling, and pain. The therapy administered to the case cat consisted of topical treatment using Oridermyl[®] ointment (Vetoquinol[®], France). Oridermyl[®] contains permethrin (antiparasitic), neomycin sulfate (antibiotic), nystatin (antifungal), and triamcinolone acetonide (anti-inflammatory), which act synergistically to address the causes of otitis externa. According to Bagus *et al.* (2023), topical permethrin is effective against ectoparasites; Sihelská *et al.* (2019) reported that nystatin inhibits *Malassezia* growth; and House *et al.* (2016) stated that triamcinolone acetonide effectively reduces inflammation and exudate in otitis cases.

After seven days of therapy, the ears of the case cat appeared cleaner, with reduced cerumen accumulation and moisture, and the cat appeared more comfortable. During treatment, no adverse effects such as irritation or swelling of the ears were observed. Prevention of adverse effects was achieved by carefully applying the medication only to the external ear canal and monitoring the ear condition daily. With this approach, the use of Oridermyl[®] proved to be effective and safe in improving the condition of otitis externa in the case cat.

In this case, supportive therapy in the form of fish oil was also administered. Fish oil contains linoleic acid and provides benefits for feline skin health. Fish oil is rich in omega-3 fatty acids, particularly eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA), which are abundant in fish from northern waters. Supplementation with EPA and DHA has been reported to serve as adjunctive therapy in animals with dermatological disorders, including reducing pruritus and improving skin and coat condition (Thomsen *et al.*, 2020 & Santiago *et al.*, 2021).

CONCLUSIONS AND SUGGESTIONS

Conclusions

The results of therapy using apple cider vinegar administered for 7 days proved effective in improving the condition of skin affected by scabiosis and malasseziosis. This was demonstrated by the reduction in alopecia and crust formation. No adverse effects were observed during the treatment period, indicating that apple cider vinegar may be considered as an alternative therapeutic option.

Suggestions

In this case, the owner was advised to continue supportive therapy with fish oil to maintain skin and coat health. The owner was also advised to routinely monitor the condition of the cat's skin and ears. In addition, the cleanliness of the cage and cat equipment should be maintained, and contact with other infected animals should be limited to prevent reinfection.

ACKNOWLEDGMENTS

The authors would like to express their gratitude to all staff members of the Laboratory of Veterinary Internal Medicine, Faculty of Veterinary Medicine, Udayana University, for their suggestions and support in the preparation of this article, as well as to all parties who contributed to the completion of this article.

REFERENCES

- Aarestrup, F. M., Lertworapreecha, M., Evans, M. C., Bangtrakulnonth, A., Chalermchaikit, T., Hendriksen, R. S., & Wegener, H. C. (2003). Antimicrobial susceptibility and occurrence of resistance genes among *Salmonella enterica* serovar Weltevreden from different countries. *Journal of Antimicrobial Chemotherapy*, 52(4), 715–718. <https://doi.org/10.1093/jac/dkg426>
- Apple, M., & Vinegar, C. (2024). *Apple cider vinegar in the combat against type 2 diabetes and obesity: An overview of recent research*.
- Arlan, L. G., & Morgan, M. S. (2017). A review of *Sarcoptes scabiei*: Past, present and future. *Parasites & Vectors*, 10, 297. <https://doi.org/10.1186/s13071-017-2234-1>
- Aykin, E., Seydim, A. C., Greene, A. K., & Guzel-Seydim, Z. B. (2014). Functional properties of vinegar. *Journal of Food Science*, 79(5), R757–R764. <https://doi.org/10.1111/1750-3841.12434>
- Bagus, I., Indra, K., Soma, I. G., Batan, I. W., Sudirman, J. P. B., Udayana, U., & Sudirman, J. P. B. (n.d.). *Otitis externa due to complication of Otodectes cynotis, bacteria, and Malassezia sp. accompanied by scabiosis in domestic cat*.
- Chandraseharan, P., Sockalingam, S. N. M. P., Shafiei, Z., Shuhud, A., Zakaria, I., Mahyuddin, A., & Rahman, M. A. (2023). The efficacy of apple cider vinegar at different pH values as an antimicrobial agent: An in vitro study.
- Chatterji, B. P., Jindal, B., Srivastava, S., & Panda, D. (2011). Microtubules as antifungal and antiparasitic drug targets. *Expert Opinion on Therapeutic Targets*, 15(2), 167–186.
- Çomak, C., & Ceylan, E. (2018). *Malassezia* spp. overgrowth in a chinchilla cat. *Turkish Journal of Bioscience and Collections*, 2(2), 32–34.
- Belyavin, C. E., van Vlymen, K., Stevens, K. B., Bond, R., & Morris, D. O. (2010). *Malassezia pachydermatis* and *M. nana* predominate amongst the cutaneous mycobiota of Sphynx cats. *Journal of Feline Medicine and Surgery*, 12(12), 917–922. <https://doi.org/10.1016/j.jfms.2010.07.002>
- Moriello, K. A. (2006). Crusted scabies (sarcoptic mange) in four cats due to *Sarcoptes scabiei* infestation. *Journal of Feline Medicine and Surgery*, 8(5), 327–329. <https://doi.org/10.1016/j.jfms.2006.05.005>
- Godinho, C. P., Prata, C. S., Pinto, S. N., Cardoso, C., & Madeira, A. (2018). Pdr18 is involved in yeast response to acetic acid stress counteracting the decrease of plasma membrane ergosterol content and order. *Scientific Reports*, 8, 7861. <https://doi.org/10.1038/s41598-018-26128-7>
- Gotthelf, L. N. (2004). Diagnosis and treatment of otitis media in dogs and cats. *Veterinary Clinics of North America: Small Animal Practice*, 34(2), 469–487. <https://doi.org/10.1016/j.cvsm.2003.10.007>
- Györke, A., Dumitrache, M. O., Ursache, A. L., D’Amico, G., & Mircean, V. (2022). Case report: Notoedric mange and aelurostrongylidosis in two domestic cats from rural environment in Romania. *Frontiers in Veterinary Science*, 9, Article 849525. <https://doi.org/10.3389/fvets.2022.849525>
- Hiblu, M. A., Ellraiss, O. M., Karim, E. S., Elmishri, R. A., & Duro, E. M. (2020). Otodectic and bacterial etiology of feline otitis externa in Tripoli, Libya. *Open Veterinary Journal*, 10(4), 377–383.

- House, R., & St. Helens Veterinary Hospital. (2016). Topical ear treatment – options, current therapy. *Journal of Small Animal Practice*. <https://doi.org/10.1111/jsap.12583>
- Kennis, R. A. (2013). Feline otitis. *Veterinary Clinics of North America: Small Animal Practice*, 43(1), 51–56. <https://doi.org/10.1016/j.cvsm.2012.09.009>
- Veterinary Medicine*. (2019). Antifungal susceptibility of *Malassezia pachydermatis*, 15–20. <https://doi.org/10.2478/fv-2019-0013>
- Mieszkina, S., Hymery, N., & Debaets, S. (2017). PT SC. *International Journal of Food Microbiology*. <https://doi.org/10.1016/j.ijfoodmicro.2017.02.013>
- de Santiago, M. S., Arribas, J. L. G., Llamas, Y. M., Becvarova, I., & Meyer, H. (2021). Controlled clinical trial measuring the effect of a dietetic food on dermatologic scoring and pruritus in dogs with atopic dermatitis. *BMC Veterinary Research*, 17, 1–8. <https://doi.org/10.1186/s12917-021-03063-w>
- Saridomichelakis, M. N., & Koutinas, A. F. (2014). Cutaneous involvement in canine leishmaniosis due to *Leishmania infantum* (syn. *L. chagasi*). *Veterinary Dermatology*, 25(2), 61–72. <https://doi.org/10.1111/vde.12105>
- Simab, P. A., Kasaei, M., & Landi, M. G. (2022). Potential of anthelmintic herbal drugs against gastrointestinal nematodes in farm animals: A review. *Frontiers in Animal Health and Nutrition*, 1(1), 26–30. <https://doi.org/10.58803/fahn.v1i1.9>
- Sotiraki, S. T., Koutinas, A. F., Leontides, L. S., Adamama-Moraitou, K. K., & Himonas, C. A. (2001). Factors affecting the frequency of ear canal and face infestation by *Otodectes cynotis* in the cat. *Veterinary Parasitology*, 96(4), 309–315.
- Expert Review of Anti-Infective Therapy. (2014). Immunomodulatory effects of antimicrobial agents. Part II: Antiparasitic and antifungal agents. *Expert Review of Anti-Infective Therapy*, 10(6). <https://doi.org/10.1586/eri.12.10>
- Thomsen, B. J., Chow, E. Y., & Sapijaszko, M. J. (2020). The potential uses of omega-3 fatty acids in dermatology: A review. *Journal of Cutaneous Medicine and Surgery*. <https://doi.org/10.1177/1203475420929925>
- Trajano, J., Ferreira, L. C., Fernandes, M. M., Sousa, N., Feitosa, T. F., & Braga, F. R. (2020). Prevalence and clinical aspects of *Otodectes cynotis* infestation in dogs and cats in the semi-arid region of Paraíba, Brazil. *Acta Scientiae Veterinariae*, 48, 1–6. <https://doi.org/10.22456/1679-9216.99156>
- UC Davis California Veterinary Emergency Team. (2024). *CVET vital signs* (Issue 08/2025). University of California, Davis. https://cvet.vetmed.ucdavis.edu/sites/g/files/dgvnsk13661/files/inline-files/CVET%20Vital%20Signs%2008_2025_0.pdf
- Yagnik, D., Vlad, S., & Shah, A. J. (2018). Antimicrobial activity of apple cider vinegar against *Escherichia coli*, *Staphylococcus aureus* and *Candida albicans*; downregulating cytokine and microbial protein expression. *Scientific Reports*, 8, 1732. <https://doi.org/10.1038/s41598-017-18618-x>
- Yang, J., Park, S., Kim, H. J., Lee, S. J., & Jung, W. H. (2023). The interkingdom interaction with *Staphylococcus* influences the antifungal susceptibility of the cutaneous fungus *Malassezia*. *Journal of Microbiology*, 33(2), 180–187.

Tables

Table 1. Results of the vital parameter examination of the case cat

No.	Type of Examination	Result	Normal Value	Description
1	Heart Rate (beats/min)	81	76–180	Normal
2	Pulse Rate (beats/min)	80	76–180	Normal
3	Capillary Refill Time (CRT)	<2 seconds	<2 seconds	Normal
4	Respiration Rate (breaths/min)	24	24–42	Normal
5	Temperature (°C)	38.6	37.5–39.2	Normal

Source: UC Davis California Veterinary Emergency Team (2024)

Table 2. Progression of the healing process in the case cat

Time	Healing Process
Day 1	Crusting, alopecia, ear cerumen, oral swelling, and hypersalivation were still present
Day 2	Crusting, alopecia, ear cerumen, oral swelling, and hypersalivation were still present
Day 3	Crusting, alopecia, ear cerumen, oral swelling, and hypersalivation began to decrease
Day 4	Crusting, alopecia, ear cerumen, oral swelling, and hypersalivation decreased
Day 5	Crusting, alopecia, ear cerumen, oral swelling, and hypersalivation decreased
Day 6	Crusting, alopecia, ear cerumen, oral swelling, and hypersalivation decreased
Day 7	Crusting, alopecia, ear cerumen, oral swelling, and hypersalivation had resolved

Figures

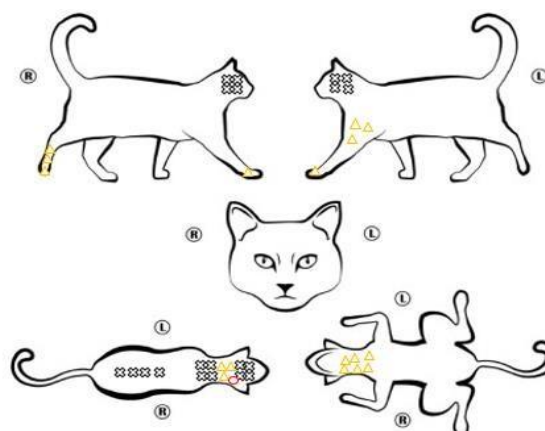


Figure 1. Distribution of lesions observed on the skin of the case cat
(X: crusting, ○: ulcer, △: alopecia)



Figure 2. Moist yellow cerumen in the right (A) and left (B) ears

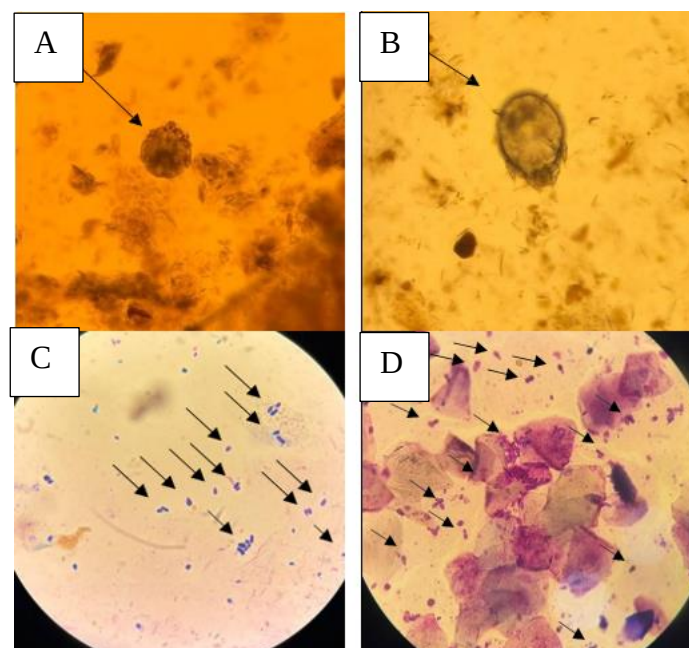


Figure 3. A. *S. scabiei* mites (black arrows) observed on superficial skin scraping examination, B. *O. cynotis* mites (black arrows) observed on otic swab examination, C. *Malassezia* sp. yeast (black arrows) observed on cytological otic swab examination of ear cerumen, and D. *Malassezia* sp. yeast (black arrows) observed on ATP examination.

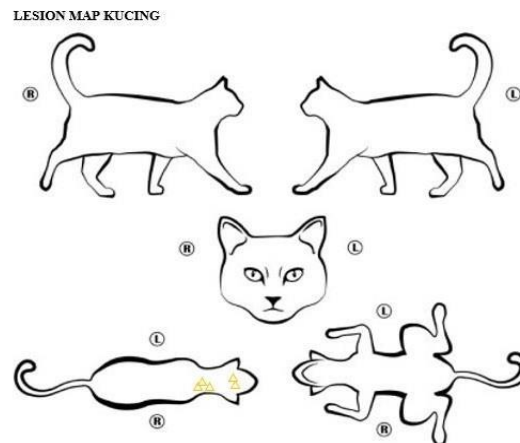


Figure 4. After treatment, alopecia remained only on the dorsal region of the head and thoracic area
(Δ : alopecia)



Figure 5. Condition of the patient after 7 days of treatment: (A) reduction of crusting and alopecia after treatment, (B) and (C) reduction of moist yellow cerumen after treatment.

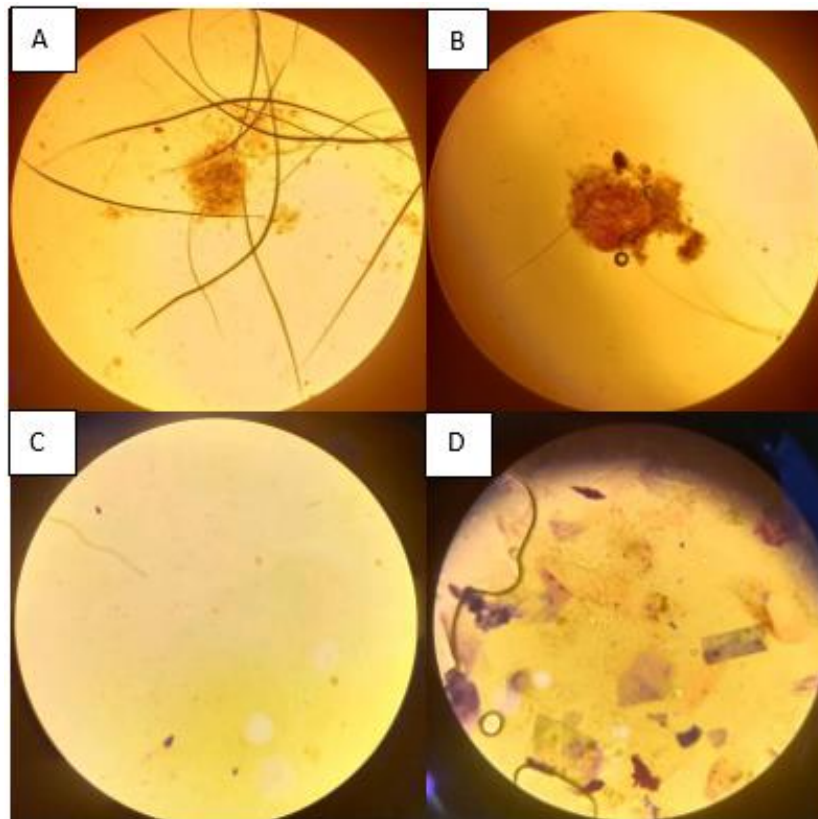


Figure 6. Condition of the patient after 7 days of treatment: (A) reduced presence of *S. scabiei* agents on skin scraping examination, (B) reduced presence of *Otodectes cynotis* agents on native otic swab examination, (C) reduced presence of *Malassezia* sp. agents on ear cerumen cytology examination, and (D) reduced presence of *Malassezia* sp. agents on ATP examination.