

**CASE REPORT: DERMATITIS IN A MIX DOG WITH TOPICAL CANDLENUT OIL THERAPY AND FINDING OF *ANCYLOSTOMA* SPP. INFECTION****Laporan Kasus: Dermatitis pada Anjing Ras Campuran dengan Terapi Topikal Minyak Kemiri dan Temuan Infeksi *Ancylostoma* spp.****Ni Luh Putu Suarniti<sup>1\*</sup>, Putu Ayu Sisyawati Putriningsih<sup>2</sup>, I Nyoman Suartha<sup>2</sup>**<sup>1</sup>Veterinary Medicine Student, Faculty of Veterinary Medicine, Udayana University, Jl. PB Sudirman, Denpasar, Bali, Indonesia, 80234;<sup>2</sup>Laboratory of Internal Medicine, Faculty of Veterinary Medicine, Udayana University, Jl. PB Sudirman, Denpasar, Bali, Indonesia, 80234;\*Corresponding author email: [putusuarniti@student.unud.ac.id](mailto:putusuarniti@student.unud.ac.id)

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**Abstract**

Dermatitis is one of the most common skin problems in dogs and can be accompanied by various clinical manifestations such as pruritus, erythema, papules, scaling, hyperpigmentation, and alopecia. This condition is multifactorial and can be caused by both infectious and non-infectious factors. *Ancylostoma* spp. infestation in dogs is known to cause gastrointestinal disorders, particularly anemia due to chronic blood loss. However, this infestation can also be associated with dermatological manifestations such as dermatitis and alopecia, which are related to percutaneous larval migration and the systemic impact of the resulting anemia. This case report describes the diagnosis and treatment of dermatitis and *Ancylostoma* spp. infection in a 1-year-old mixed-breed female dog with symptoms of generalized alopecia, pruritus, erythema, hyperpigmentation, scaling, papules, and scooting, as well as a thin body condition. Diagnostic methods included clinical examination and skin, fecal, and complete blood count examinations. The results revealed the presence of *Ancylostoma* spp. eggs, skin examination revealed no detectable ectoparasites or dermatological pathogens, and the blood test results showed lymphocytosis, granulocytopenia, and mild thrombocytopenia. Treatment included a combination of pyrantel pamoate as an anthelmintic, chlorpheniramine maleate as an antihistamine, vitamin B-complex supplements, and topical candlenut oil to support skin regeneration and promote hair growth. Clinical evaluation over 14 days showed significant improvement, with the disappearance of pruritus, new hair growth, and a negative stool test for worm eggs. This combination therapy approach has proven effective and can be an alternative natural treatment that supports skin recovery in cases of dermatitis and *Ancylostoma* spp. infection.

Keywords: Alopecia, *Ancylostoma* spp., Candlenut Oil, Dermatitis, Dogs, Pyrantel Pamoate

### Abstrak

Dermatitis merupakan salah satu masalah kulit yang paling sering ditemukan pada anjing dan dapat disertai berbagai manifestasi klinis seperti pruritus, eritema, papula, scaling, hiperpigmentasi, serta alopesia. Kondisi ini bersifat multifaktorial dimana dapat disebabkan oleh faktor infeksius maupun non-infeksius. Infestasi *Ancylostoma* spp. pada anjing umumnya dikenal sebagai penyebab gangguan gastrointestinal, terutama anemia akibat kehilangan darah kronis. Namun demikian, infestasi ini juga dapat berasosiasi dengan manifestasi dermatologis, seperti dermatitis dan alopesia, yang berkaitan dengan migrasi larva secara percutaneus serta dampak sistemik dari anemia yang ditimbulkan. Laporan kasus ini bertujuan untuk menggambarkan diagnosis dan penanganan dermatitis dan infeksi *Ancylostoma* spp. pada seekor anjing betina ras campuran, berumur 1 tahun dengan gejala alopesia menyeluruh, pruritus, eritema, hiperpigmentasi, *scale*, papula, dan *scooting*, serta kondisi tubuh kurus. Metode diagnosis meliputi pemeriksaan klinis, pemeriksaan kulit, feses, dan darah lengkap. Hasil pemeriksaan penunjang menunjukkan keberadaan telur *Ancylostoma* spp. pada pemeriksaan feses, hasil pada pemeriksaan kulit tidak ditemukan adanya agen, dan dari pemeriksaan darah anjing mengalami limfositosis, granulositopenia, dan trombositopenia ringan. Penanganan dilakukan dengan kombinasi pirantel pamoat sebagai antelmintik, chlorpheniramine maleate sebagai antihistamin, suplemen vitamin B kompleks, serta minyak kemiri topikal untuk mendukung regenerasi kulit dan pertumbuhan rambut. Evaluasi klinis selama 14 hari menunjukkan perbaikan signifikan berupa hilangnya pruritus, pertumbuhan rambut baru, dan hasil feses negatif terhadap telur cacing. Pendekatan terapi kombinasi ini terbukti efektif dan dapat menjadi alternatif pengobatan alami yang mendukung pemulihan kulit pada kasus dermatitis dan infeksi *Ancylostoma* spp.

Kata kunci: Alopesia, *Ancylostoma* spp., Anjing, Dermatitis, Minyak Kemiri, Pirantel Pamoat

### INTRODUCTION

Hair is a symbol of beauty and attractiveness. In addition to supporting appearance, hair has several functions, including determining identity, providing protection against environmental conditions such as sunlight and cold weather, and serving as an indicator of overall health (Shoviantari *et al.*, 2020). Disorders in the structure or growth cycle of hair can lead to baldness, also known as alopecia, which is the loss of hair that can be localized or widespread in nature. Dermatitis is one of the most common skin problems in dogs and can be accompanied by various clinical manifestations such as pruritus, erythema, papules, scaling, hyperpigmentation, and alopecia. This condition can be caused by various factors, such as bacteria, fungi, and parasites, as well as non-infectious factors, such as allergies, hormonal disorders (hypothyroidism, hyperadrenocorticism), nutritional deficiencies, and environmental irritants (Scott *et al.*, 2013).

One systemic cause that may be associated with dermatological disorders in dogs is gastrointestinal parasitic infection, particularly hookworms of the genus *Ancylostoma* (Dantas-Torres *et al.*, 2020). *Ancylostoma* spp. are hematophagous nematodes that infect the small intestine of dogs and cause chronic blood loss, anemia, and nutritional disorders (Bowman, 2021). This infection is endemic to tropical and subtropical regions, especially in environments with poor sanitation and suboptimal husbandry management (Traversa, 2012).

In addition to causing digestive system disorders, *Ancylostoma* spp. infections have been associated with skin disorders (Ural *et al.*, 2012; Peregrine, 2023). Third-stage infective larvae (L3) can penetrate the skin percutaneously and trigger local inflammatory reactions and hypersensitivity responses, which may clinically manifest as dermatitis accompanied by pruritus and alopecia (Ural *et al.*, 2012). However, skin lesions in cases of ancylostomiasis

are generally nonspecific, and larval migration in the skin is often not directly demonstrable through dermatological examinations (Peregrine, 2023). Therefore, the relationship between *Ancylostoma* spp. infection and dermatitis in dogs is more accurately understood as a clinical association that requires confirmation through supportive examinations, particularly fecal examinations (Bowman, 2021). The treatment of ancylostomiasis in dogs is generally carried out by administering anthelmintics such as pyrantel pamoate, fenbendazole, or milbemycin, accompanied by supportive therapy according to the clinical condition of the patient (Bowman, 2021; Papich, 2016). In cases accompanied by skin disorders and alopecia, additional therapy is required to reduce inflammation, improve skin health, and support hair follicle regeneration (Miller *et al.*, 2013).

Candlenut oil (*Aleurites moluccanus*) is traditionally known in Indonesia as a hair growth agent for humans and animals. The content of essential fatty acids, such as linoleic acid and oleic acid, as well as bioactive compounds, such as flavonoids and saponins, is believed to have anti-inflammatory and antioxidant effects and to support skin tissue regeneration and hair growth (Hidayat *et al.*, 2018; Shoviantari *et al.*, 2020; Miftahurahma *et al.*, 2023). Topical application of candlenut oil has been reported to increase hair growth and density in animal models (Shoviantari *et al.*, 2020; Miftahurahma *et al.*, 2023). Based on this background, this case report aims to report a case of dermatitis in a mixed-breed dog treated with topical candlenut oil, accompanied by findings of *Ancylostoma* spp. infection through fecal examination.

## RESEARCH METHODS

### Signalment and Anamnesis

The patient was a brown female mixed-breed corgi, aged 1 year and weighing 5 kg. Based on the anamnesis obtained from the owner, the dog was adopted approximately one month ago and was experiencing hair loss over almost its entire body. The dog had a habit of scratching and dragging its rear end across the floor. The owner complained that the dog had diarrhea more than three times a day with a paste-like consistency and sometimes a normal consistency, and the dog had a habit of eating its own feces. The dog was fed rice mixed with chicken liver and chicken head. The dog was kept in a kennel, and the owner had 10 other dogs that were kept separately from the affected dog. The dog was administered flea medication (Simparica®) one day after adoption and was bathed twice during the adoption period using a special dog shampoo; however, there was no improvement, as the dog continued to scratch and showed no signs of hair regrowth. The dog had not been administered deworming medication or vaccinations.

### Physical Examination

Clinical examination included examination of the cat's present status, including body temperature, respiratory rate, heart rate, pulse rate, and capillary refill time (CRT), as well as the general condition of the dog, and physical examination of all systems, including inspection, palpation, auscultation, and percussion. In this case, specifically for the integumentary system, the physical examination included inspection, screening of the dog's skin and nails, palpation, auscultation, and percussion of the abdomen.

### Acetate Tape Preparation (ATP) Examination

Samples were collected using the skin tape method from areas of the skin experiencing itching, redness, alopecia, and scaling. The tape was then attached to a glass slide, fixed using methanol, stained with eosin and methylene blue using the Diff-Quick method, and rinsed

with running water. The samples were then examined under a microscope at 1000× magnification. The examination results were negative, with no agents detected in the sample.

### **Skin Scraping**

There are two methods of skin scraping: superficial and deep skin scraping. Samples were collected from skin affected by alopecia and scaling and then scraped using a scalpel. The sample adhering to the scalpel was placed on an object glass containing KOH and chopped to a size that was not too large and thick. The samples were then covered with a cover glass and examined under a microscope at 40× and 100× magnification. In the superficial skin scraping method, scraping is performed on the skin surface, while deep skin scraping is a skin scraping method performed down to the dermis layer, usually until there is slight capillary bleeding, because some parasites (e.g., Demodex) live in hair follicles or sebaceous glands in the inner layer of the skin (Permatasari *et al.*, 2024). The results of superficial and deep skin scraping examinations did not reveal the presence of any agents.

### **Trichogram**

A trichogram examination was performed by pulling out several strands of hair down to the root using needle holders. The samples were observed under a microscope at 40× magnification.

### **Stool Examination**

Stool examination can be performed macroscopically, including color, odor, and consistency, as well as microscopically, including native, sedimentation, and flotation methods.

### **Complete Blood Count (CBC)**

A complete blood count was performed by drawing blood from the cephalic vein using a 3 ml syringe. The blood sample was then stored in a tube containing ethylenediaminetetraacetic acid (EDTA) to prevent blood clotting. Blood samples were collected and sent to the Veterinary Teaching Hospital, Udayana University, for examination using a Hematology Analyzer.

## **RESULTS AND DISCUSSION**

### **Physical Examination Results**

The results of the physical examination (Table 1) showed that the heart rate and pulse of the case animal were within normal limits. The results of the CRT examination showed that the case dog had a CRT of <2 s with rapid skin turgor. The respiratory rate of the case animal was 72 breaths/min with a body temperature of 39.4 °C. This indicates an increase in the respiratory rate and body temperature of the animal.

Clinical examination results (Table 2) Based on the inspection and screening of the dog's skin and nail system, frequent scratching was observed with a pruritus score of 5/10. In addition, the dog exhibited scooting behavior, which is the habit of rubbing the perineal area against the floor surface. Alopecia was found on the face, ears, body, abdomen, front and rear legs, and tail. Scales were scattered on the body, papules on the dorsal area, erythema on the nose and digits, and hyperpigmentation on the ears (Figures 1 and 2). In the respiratory system, the dog experienced tachypnea, which was suspected to be due to stress caused by environmental changes, physical examination, and discomfort experienced by the patient due to its clinical condition. The dog was thin, with a Body Condition Score (BCS) of 3/9.

## **Dermatological Examination Results**

The dermatological examination performed, namely the ATP test, showed negative results with no agents found in the sample. Skin scraping (superficial and deep skin scraping) showed negative results, with no agents found in the sample. Trichogram showed that the hair was in the anagen phase, with some hair medulla structures missing, no breakage, and no agents (Figure 3).

## **Fecal Examination Results**

Fecal examination can be performed macroscopically, including color, odor, and consistency (Figure 5), as well as microscopically, including native, sedimentation, and flotation methods. Microscopic examination of feces using the flotation method revealed worm eggs, with 5-6 *Ancylostoma* spp. eggs observed in one field of view (Figure 6). *Ancylostoma* eggs were identified based on their ovoid shape, thin shell, colorless appearance, and the presence of 8-16 morulae (Widyaningsih *et al.*, 2022).

## **Complete Blood Count (CBC) Results**

Complete blood count (CBC) results in dogs showed hematological changes, including lymphocytosis, granulocytopenia, and thrombocytopenia, accompanied by an increase in Platelet Distribution Width (PDW) and a decrease in Plateletcrit (PCT), as shown in Table 4.

## **Diagnosis and Prognosis**

This diagnosis was made based on the dog's medical history, which included almost complete hair loss over most of its body, frequent scratching and dragging of the perineal area (scooting), diarrhea more than three times a day with a paste-like consistency and occasional normal stools, and a habit of eating its own feces (coprophagia). Physical examination revealed total alopecia, erythema, papules, hyperpigmentation, and skin scaling. Trichogram examination showed that most hairs were in the anagen phase, with some empty medullary hair structures, indicating follicular nutritional disorders and chronic inflammation of the skin. Fecal examination (float test) revealed *Ancylostoma* spp. eggs, confirming hookworm infestation. Hematological examination (CBC) revealed lymphocytosis, granulocytopenia, thrombocytopenia, increased PDW, and decreased PCT, indicating an immune response to parasitic infection and possible blood loss due to hookworm infestation. Based on the results of the anamnesis, physical examination, and supporting tests, the dog was diagnosed with dermatitis and *Ancylostoma* spp. infection. The prognosis was favorable.

## **Treatment**

The dog was administered causative therapy with pyrantel pamoate (Combantrin®) at a dose of 10 mg/kg BW, 50 mg orally, repeated on the 14th day after the first administration. Chlorpheniramine maleate (CTM) 0.5 mg/kg BW q 12h orally for three days as an antihistamine. Livron B Plex 1 tablet/day for 7 days was administered as a supplement. Tropical therapy with topical application of candlenut oil (*Aleurites moluccana*) twice daily for 14 days. The topical application of candlenut oil aims to improve skin moisture, support epithelial regeneration, and reduce dermatitis-related irritation.

## **Evaluation**

Clinical evaluation during the 7 days of treatment showed a decrease in the level of pruritus, marked by a reduction in the frequency of scratching and scooting behavior (rubbing the perineal area on the floor), which was rarely observed in the present case. The erythema in the interdigital area had disappeared, and new hair growth was beginning to appear in the area that had experienced alopecia; however, the growth was not yet even. At the 14-day

post-treatment evaluation, the clinical condition continued to improve. The dog no longer experienced intermittent diarrhea, and fecal examination revealed no *Ancylostoma* eggs. Pruritus was no longer apparent, and hair growth in the previously alopecic areas became more even and denser (Figure 6).

## Discussion

A case of a mixed-breed female dog showed signs of dermatitis with total alopecia, which was later confirmed to be infected with *Ancylostoma* spp. through fecal examination. This case is important because it shows the relationship between gastrointestinal worm infection and secondary dermatological disorders, which require combination therapy with systemic antiparasitic and topical treatments.

Ancylostomiasis is a parasitic disease caused by hookworms of the genus *Ancylostoma* spp., which commonly infect the small intestine of dogs. These parasites are hematophagous and cause chronic blood loss and microscopic anemia (Bowman, 2021). In addition to systemic disorders, *Ancylostoma* infection can cause skin manifestations due to percutaneous penetration of larvae. The skin lesions are generally inflammatory and are accompanied by pruritus, papules, and alopecia (Ural *et al.*, 2012).

*Ancylostoma* spp. infestation in dogs not only causes systemic disorders, such as anemia, but can also trigger skin disorders, such as dermatitis and alopecia. The mechanism of alopecia in cases of Ancylostomiasis begins with the penetration of infectious larvae (third-stage larvae) into the skin. The larvae penetrate the epidermis to the dermis, causing a local inflammatory reaction due to the release of mediators such as histamine, prostaglandins, and proinflammatory cytokines (IL-1, IL-6, and TNF- $\alpha$ ). This inflammatory response results in skin tissue damage, increased vascular permeability, and impaired microcirculation around the hair follicles (Scott *et al.*, 2013; Peregrine, 2023). This inflammatory response causes skin tissue damage, increased vascular permeability, and impaired microcirculation around the hair follicles, which play an important role in maintaining the hair growth phase.

Hair follicles can be damaged directly as a result of larval penetration or indirectly as a result of prolonged inflammation. Chronic inflammation causes the follicles to degenerate and enter the premature telogen phase, resulting in easy hair loss and diffuse or focal alopecia (Miller *et al.*, 2013). Additionally, the itching caused by larval activity leads dogs to frequently scratch and lick the infested areas, which further exacerbates mechanical damage to hair follicles and hair shafts and prolongs the skin inflammatory process (Peregrine, 2023).

Systemically, *Ancylostoma* spp. are hematophagous, sucking the blood of their hosts and causing loss of iron, albumin, and plasma proteins (Bowman, 2021). This nutritional deficiency disrupts keratin and collagen formation in the skin, reducing the strength and elasticity of hair follicles. Hypoproteinemia also lowers plasma oncotic pressure, which affects skin nutrition. Consequently, hair growth is disrupted, and hair appears dull, brittle, and experiences diffuse hair loss (Santos *et al.*, 2024).

Trichogram examination in this case showed hair in the anagen phase with partial loss of medullary structure without any breakage in the hair shaft, indicating that the hair follicles were still biologically active and undergoing regeneration. This finding indicates that alopecia is non-scarring, and the dominant anagen phase indicates the ongoing mitotic activity of follicular matrix cells (Müller *et al.*, 2021). The partial loss of the medullary structure without breakage indicates keratinization and follicular nutrition disorders due to the release of inflammatory mediators, such as histamine, prostaglandin, IL-1, and TNF- $\alpha$ , which inhibit the supply of oxygen and nutrients to the follicles (Peregrine, 2023). The

absence of hair shaft breakage rules out the possibility of mechanical trauma due to scratching, suggesting that alopecia is more likely caused by follicular dysfunction resulting from systemic inflammatory processes and metabolic stress than by mechanical trauma.

Fecal examination using the flotation method revealed 5–6 *Ancylostoma* spp. eggs per field of view, with morphological characteristics of being ovoid, thin-shelled, and containing a morula (Widyaningsih *et al.*, 2022). Although there are no guidelines explicitly stating that this number falls into the category of moderate to severe infection, the findings clinically indicate a significantly active infection. To determine the severity of infestation more accurately, a supporting examination in the form of a quantitative fecal egg count, such as the McMaster or modified Wisconsin methods, is required. This allows for the calculation of the number of eggs per gram of stool and helps in monitoring the response to treatment (Traversa, 2012; Peregrine, 2023). The black color of the feces with reddish-brown sediment is thought to be due to microbleeding in the gastrointestinal tract caused by the attachment of the adult worms. CBC results showed lymphocytosis and granulocytopenia, indicating an immune response to chronic infection (Bowman, 2021), as well as mild thrombocytopenia accompanied by increased PDW and decreased PCT, which could be caused by platelet loss due to chronic microbleeding in the intestines (Dantas-Torres *et al.*, 2020).

In this case, the causative therapy used was pyrantel pamoate, a tetrahydropyrimidine anthelmintic that works by blocking neuromuscular transmission in worms, causing spastic paralysis and elimination through feces (Bowman *et al.*, 2010; Papich, 2016). Repeating the dose on the 14th day after the first administration is intended to eliminate adult worms originating from tissue larvae that migrate to the intestine after initial therapy, owing to the prepatent period of *Ancylostoma* being  $\pm 14$ –21 days (Traversa, 2012). Chlorpheniramine maleate is used to control pruritus by blocking the effects of histamine on the skin, whereas Livron B Plex, a vitamin B complex supplement, supports energy metabolism, tissue regeneration, and immunity (Ananda *et al.*, 2022).

Candlenut oil (*Aleurites moluccanus*) contains bioactive compounds such as linoleic acid, oleic acid, tocopherol (vitamin E), flavonoids, and saponins, which play an important role in accelerating hair growth (Shoviantari *et al.*, 2020; Hidayat *et al.*, 2018; Miftahurahma *et al.*, 2023). Linoleic and oleic acids repair the skin's lipid layer and improve microcirculation in the follicle area, thereby improving the supply of oxygen and nutrients to the hair roots. Vitamin E acts as an antioxidant that protects follicles from oxidative stress (Hidayat *et al.*, 2018), whereas flavonoids and saponins have anti-inflammatory effects that aid in follicle tissue regeneration. Candlenut oil also plays a role in keratin formation, which strengthens the new hair structure. These compounds help repair damaged hair follicles and increase moisture in the inflamed skin. This is in line with the study by Miftahurahma *et al.* (2023), who showed that topical application of candlenut oil can significantly increase hair density in experimental animals. Physiologically, increased nutrition and microcirculation around the follicles prolong the anagen phase and accelerate hair growth transition, making candlenut oil effective in supporting hair regeneration after follicle damage caused by chronic inflammation.

## CONCLUSION AND SUGGESTIONS

### Conclusion

*Ancylostoma* spp. infection not only causes gastrointestinal disorders but can also cause dermatological effects, such as dermatitis and alopecia, due to larval migration through the skin and systemic effects of chronic anemia. Diagnosis is confirmed through stool and complete blood tests that show signs of active infection and a systemic immune response.

Appropriate treatments include pyrantel pamoate anthelmintic therapy, pruritus control, vitamin B complex, and topical application of candlenut oil. The treatment results showed significant clinical improvement, with normal hair growth and negative post-treatment stool examination results for worm eggs. The prognosis for this case was favorable because no severe systemic complications were found, and the response to therapy was excellent.

### Suggestions

Sick dogs should be temporarily separated from healthy dogs to prevent disease transmission. Ensure that drinking water and food provided are clean and free from contamination with infectious worm eggs or larvae, and replace the food with specialized dog food that supports skin health. Therapy should be routinely administered as recommended by a veterinarian. Additionally, environmental hygiene must be maintained to break the transmission cycle of the parasites.

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### REFERENCES

- Ananda, M. K., Anthara, M. S., Erawan, I. G. M. K., & Jayanthi, P. D. (2022). Laporan kasus: Infeksi cacing tambang (*Ancylostomiasis*) yang menimbulkan ascites pada anjing peranakan Pomeranian umur empat bulan. *Indonesia Medicus Veterinus*, *11*(4), 507–517. <https://doi.org/10.19087/imv.2022.11.4.507>
- Bowman, D. D. (2021). *Georgis' parasitology for veterinarians* (11th ed.). Elsevier.
- California Veterinary Emergency Team (CVET), University of California (UC), Davis. (2024). *Normal vital signs: Vitals chart* (Last Updated April 2024). <https://cvet.vetmed.ucdavis.edu/sites/g/files/dgvnsk13661/files/inline-files/CVET%20Vital%20Signs%2004%2024%20%281%29.pdf>
- Dantas-Torres, F., Chomel, B. B., & Otranto, D. (2020). Hookworms in dogs and cats: An update. *Parasites & Vectors*, *13*(1), 1–17. <https://doi.org/10.1186/s13071-020-04252-x>
- Hidayat, T., Indriaty, S., & Yusnita, Y. (2018). Aktivitas antioksidan dan antimikroba ekstrak biji kemiri (*Aleurites moluccanus* L.). *Jurnal Kimia Sains dan Aplikasi*, *21*(3), 110–115. <https://doi.org/10.14710/jksa.21.3.110-115>
- Miftahurahma, N. M. L., Manalu, W., & Ilyas, A. Z. (2023). Efektivitas minyak kemiri (*Aleurites moluccana* L.) sebagai penumbuh rambut pada tikus (*Rattus norvegicus*). *Jurnal Veteriner dan Biomedis*, *1*(2), 65–71. <https://doi.org/10.29244/jvetbiomed.1.2.65-71>
- Miller, W. H., Griffin, C. E., & Campbell, K. L. (2013). *Muller and Kirk's small animal dermatology* (7th ed.). Elsevier Mosby.
- Müller, R. S., Rosenkrantz, W. S., & Griffin, C. E. (2021). *Muller & Kirk's small animal dermatology* (8th ed.). Elsevier.
- Papich, M. G. (2016). *Saunders handbook of veterinary drugs* (4th ed.). Elsevier.
- Peregrine, A. S. (2023). Hookworms in small animals. In *Merck veterinary manual*. Merck & Co., Inc.

Permatasari, D. A., Putriningsih, P. A. S., & Soma, I. G. (2024). Scabiosis with ancylostomiosis in a local dog. *Veterinary Science and Medicine Journal*, 6(2), 121–134. <https://doi.org/10.24843/vsmj.2024.v6.i02.p03>

Santos, A. C. G., Silva, L. M. R., Pereira, M. F., & Costa, J. S. (2024). Systemic effects of hookworm infection on nutritional status and hair coat quality in dogs. *Veterinary Parasitology*, 323, 110012. <https://doi.org/10.1016/j.vetpar.2023.110012>

Scott, D. W., Miller, W. H., & Griffin, C. E. (2013). *Small animal dermatology* (7th ed.). Elsevier.

Shoviantari, F., Liziarmezilia, Z., Bahing, A., & Agustina, L. (2019). Uji aktivitas tonik rambut nanoemulsi minyak kemiri (*Aleurites moluccana* L.). *Jurnal Ilmu Kefarmasian Indonesia*, 17(1), 23–29. <https://doi.org/10.20473/jfiki.v6i22019.69-73>

Shoviantari, F., Liziarmezilia, Z., Bahing, A., & Agustina, L. (2020). Uji aktivitas tonik rambut nanoemulsi minyak kemiri (*Aleurites moluccana* L.). *Jurnal Farmasi dan Ilmu Kefarmasian Indonesia*, 6(2), 69–73. <https://doi.org/10.20473/jfiki.v6i22019.69-73>

Traversa, D. (2012). Pet roundworms and hookworms: A continuing need for global worming. *Parasites & Vectors*, 5, 91. <https://doi.org/10.1186/1756-3305-5-91>

Ural, K., Ozyıldız, Z., & Yılmaz, R. (2012). Clinical and histopathological findings in dogs with hookworm dermatitis. *Veterinarija ir Zootechnika*, 57(79), 67–71.

Widyaningsih, P. O., Suartha, I. N., & Batan, I. W. (2022). Penanganan ancylostomiosis pada anjing Pomeranian betina. *Indonesia Medicus Veterinus*, 11(3), 386–397. <https://doi.org/10.19087/imv.2022.11.3.386>

## Tables

Table 1. Results of Physical Examination (Present Status) in the Case Dog

No.	Type of Examination	Result	Reference Range*	Remarks
1.	Rectal Temperature (°C)	39.4	38.0–39.2	Abnormal
2.	Heart Rate (beats/minute)	112	60–160	Normal
3.	Pulse Rate (beats/minute)	108	60–160	Normal
4.	Respiratory Rate (breaths/minute)	72	10–30	Abnormal
5.	Capillary Refill Time (CRT) (seconds)	< 2	< 2	Normal

Source: CVET UC Davis (2024)

Table 2. Results of Clinical Examination in the Case Dog

No.	Organ System	Findings	No.	Organ System	Findings
1.	Genital	Normal	7.	Urogenital	Normal
2.	Skin and Claws	Abnormal	8.	Musculoskeletal	Normal
3.	Mucous Membranes	Normal	9.	Nervous System	Normal
4.	Circulatory System	Normal	10.	Lymph Nodes	Normal
5.	Respiratory System	Abnormal	11.	Ears	Normal
6.	Digestive System	Normal	12.	Eyes	Normal

Table 3. Results of Macroscopic Examination of Feces in the Case Dog

Examination	Result
Color	Black feces with reddish-brown fecal sediment
Odor	Foul-smelling with a slightly fishy odor
Consistency	Firm

Table 4. Complete Blood Count (CBC) Results of the Case Dog

Parameter	Unit	Result	Reference Range	Remarks
White Blood Cell (WBC)	$\times 10^3/\mu\text{L}$	6.96	6–17	Normal
Lymphocytes#	$\times 10^3/\mu\text{L}$	5.47	0.8–5.1	Increased
Granulocytes#	$\times 10^3/\mu\text{L}$	1.07	4–12.6	Decreased
Lymphocytes (%)	%	78.8	12–30	Increased
Granulocytes (%)	%	15.4	60–83	Decreased
Red Blood Cell (RBC)	$\times 10^6/\mu\text{L}$	67.08	5.5–8.5	Normal
Hemoglobin	g/dL	16.8	11–19	Normal
Platelet	$\times 10^3/\mu\text{L}$	106	117–460	Decreased
Platelet Distribution Width (PDW)	fL	18.2	10–18	Increased
Plateletcrit (PCT)	%	0.088	0.1–0.5	Decreased

### Figures



Figure 1. Clinical condition of the case dog. (A) Dorsal view. (B) Frontal view. The case dog showed alopecia (black arrows), scales, papules, erythema (orange arrows), and hyperpigmentation (blue arrows).

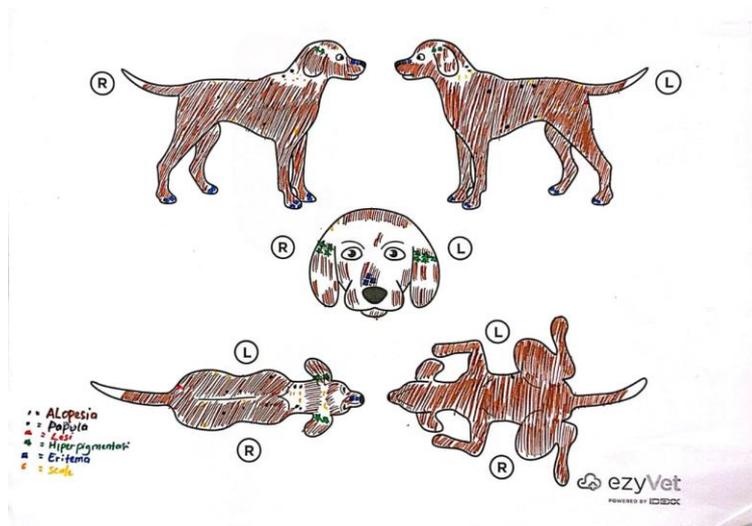


Figure 2. Distribution map of skin lesions in the case dog

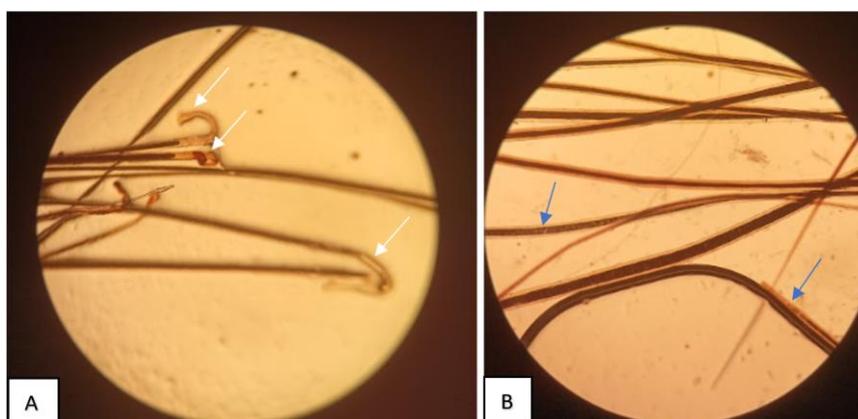


Figure 3. Trichogram examination results. (A) Hair root. (B) Hair shaft. The hair was in the anagen phase (white arrows), and partial loss of the medullary structure was observed (blue arrows).



Figure 4. Fecal samples. (A) Before centrifugation. (B) After centrifugation. The feces were black in color with reddish-brown fecal sediment.

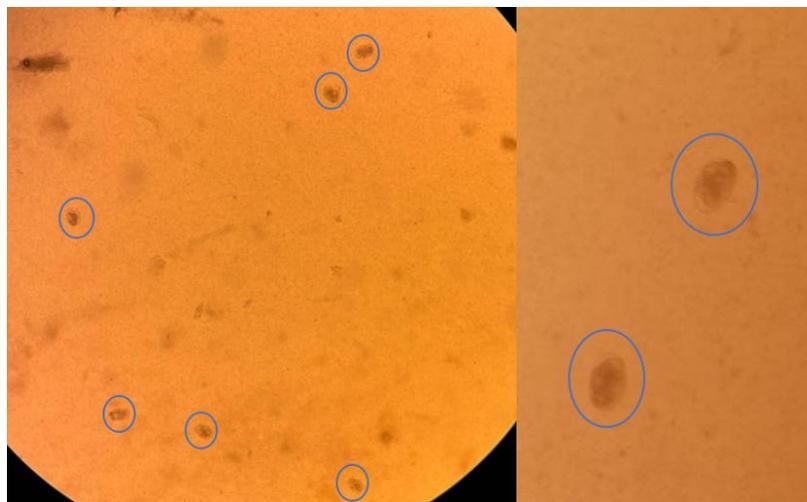


Figure 5. Results of fecal examination using the flotation method showing the presence of *Ancylostoma* spp. eggs. The eggs were ovoid in shape, thin-shelled, and contained a morula (blue circle) (100×).



Figure 6. (a) Evaluation after 7 days of therapy showing the onset of new hair growth in alopecic areas, although the growth was not yet uniform; (b) Evaluation after 14 days of therapy showing uniform and denser hair regrowth in previously alopecic areas.