

Cat Scabies Prevalence at Animal Health Center Pemalang

Prevalensi Scabies pada Kucing di Pusat Kesehatan Hewan Pemalang

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Abstrak

Skabies pada kucing merupakan penyakit kulit menular yang sering dijumpai pada kucing yang disebabkan oleh tungau *Sarcoptes scabiei* yang menyerang lapisan kulit stratum korneum kucing pada semua tingkat usia dan zoonosis. Penelitian ini bertujuan untuk mengetahui besar prevalensi scabies dengan data pasien kucing di Pusat Kesehatan Hewan Pemalang selama 13 Mei-15 Juli 2022 dan informasi morfologi *S. scabiei*. Metode yang digunakan yaitu diagnosa scabies dengan dua tahap yaitu pemeriksaan gejala klinis dan laboratoris. Pemeriksaan laboratoris sampel dipilih melalui *purposive sampling*. Kucing dengan gejala klinis scabies menggunakan teknik *skin scraping* dengan cara kulit dikerok diambil di area sekitar lesi kemudian diletakkan pada *object glass* dan ditetesi 10% KOH (potassium hydroxide) kemudian ditutup *cover glass* dan diperiksa dibawah mikroskop dengan perbesaran (100x) atau (400x). Hasil penelitian menunjukkan pravalensi scabies pada pasien kucing di Pusat Kesehatan Hewan di Pemalang sebesar 33,19 % dan pasien kucing ditemukan *S. scabiei* pada bagian kaki.

Kata kunci: kucing; Pemalang; prevalensi; skabies; zoonosis

Abstract

Scabies in cats is an infectious skin disease caused by the mite *Sarcoptes scabiei* that attacks the stratum corneum layer of the cat's skin at all ages and is zoonotic. The purpose of this study is to determine the prevalence of scabies using cat patient data from the Animal Health Center in Pemalang from May 13th to July 15th, 2022, as well as morphological information of *S. scabiei*. The scabies diagnosis method employs two stages, namely the examination of clinical and laboratory symptoms. Purposive sampling was used to select laboratory examination samples. Cats with clinical scabies use the skin scraping technique, which involves scraping the skin in the area around the lesion, placing it on an object glass, dripping with 10% KOH (potassium hydroxide), covering it with a cover glass, and examining under a microscope with magnification of 100x or 400x. The prevalence of scabies in cat patients at the Animal Health Center in Pemalang was 33.19%, and *S. scabiei* was found on the legs of cat patients.

Keywords: cats; Pemalang; prevalence; scabies; zoonosis

Introduction

Scabies, or sarcoptic mange when referring to animals, is a contagious animal parasitic skin disease caused by *Sarcoptes scabiei*. Animal variants of *S. scabiei* have managed to survive on human skin. Human-to-animal transmission has been documented, and cross-transmission of

S. scabiei between different animal species has been reported in more than 50 species (Moroni et al., 2022). The majority of scabiosis cases in Indonesia are in livestock (cows, pigs, goats, and rabbits) and domestic animals (dogs and cats). At the Scotty Pet Mataram clinic, 57% of cats were infected with *Notoedres cati* mites on the scabiosis-infected surface area, which included the head, face, ears, and feet (Susanto et al., 2021), *Sarcoptes scabiei* was discovered by 44% of Malang residents (Prasetyo et al., 2019).

The tropical climate conditions that support the development of the causative agent of scabiosis are high factors of prevalence in Indonesia, and it gets worse when the temperature and weather are humid in conditions during May-July because it is entering the transition season between the rainy season and the dry season (Cahya et al., 2022). Other factors include age, with cats infected with scabies being less than a year old on average, and the possibility of contracting them from parents who have previously been infected with scabies (Susanto et al., 2020). Race, age, and gender were not significant risk factors for scabiosis prevalence in cats in the study, and there was no increase in cases of scabiosis prevalence in cats at the Griya Satwa Clinic, Magetan Regency, 2020 period (Cahya et al., 2022). Scabiosis in cats is very easy to spread from one cat to another. If not treated immediately, this can be harmful and fatal (Amir et al., 2020). Burrowing mites cause skin tissue damage, dermatitis, blood and body fluid loss, allergies, and secondary bacterial infections (Kraabol et al., 2015). As a result, cat owners must be aware of the symptoms of scabiosis on the skin's surface, such as scabs, scales, alopecia, papules, hyperemia, and bad skin on the head, face, ears, and feet (Susanto et al., 2021), visit a veterinarian frequently if these symptoms appear. This study intends to

look at the factors that lead to skin conditions in cats, the prevalence of scabies in cats admitted to Animal Health Center in Pemalang from 13th Mei to 15th July 2022, and possible ways to prevent it in order to lower the number of cases of scabiosis there.

Materials and Methods

Data on cat patients were collected at the Animal Health Center in Pemalang, and then samples were taken using purposive sampling with informed consent from the owner for cat patients with alopecia with lesions or scabs. 10% KOH (potassium hydroxide), immersion oil, cotton, iodine, and 70% alcohol were used. A surgical scalpel, object glass, cover glass, and microscope are among the tools used.

Data was collected from patients being treated at the Animal Health Center in Pemalang between May 13th and July 15th, 2022. Scabies clinical manifestations were examined in the cats. drh. Abdul Muntolip of Puskesmas Pemalang conducted this examination. Purposive sampling was used to select the 156 cats with clinical manifestations of scabies, and the animal owner's consent was obtained. Sampling was done on lesions on the ears, head, tail, or feet by scraping them until they bled with a scalpel and then placing the sample in a plastic clip. The samples were examined at Departement Parasitology in Faculty of Veterinary Medicine at Gadjah Mada University. The sample was placed on an object glass and dripped with 10% KOH (potassium hydroxide) before being observed under a microscope at a magnification of (100x) or (400x). Magnification 400x can see its whole body. The mites discovered were identified.

Result and Discussion

Scabies is caused by mites burrowing in human or other mammals' epidermis (*stratum granulosum*). This article discussed the morphology, biology of mites, such as the life cycle, and basic diagnosis in the Pemalang animal health center, as well as the health management and prevention of scabies in cats. The prevalence Animal Health Center in Pemalang for scabies cases is 33.19%. The

people to avoid Scabies by paying attention to these things:

Prevalence *Sarcoptes scabiei* at Animal Health Center in Pemalang

Prevalent *Sarcoptes scabiei* at Pemalang Animal Health Center was 33.19%. Observations have been made on pets (cats) infected with *S. scabiei* at the animal health center in Pemalang. The parts of the body that are often infected by scabiosis are the head, face, ears and feet. Behaviors that can increase scabiosis include lack of environmental cleanliness and lack of cleanliness in caring for cats, sanitation of cages, etc.

Morphology of *Sarcoptes scabiei*

Sarcoptes scabiei, a cosmopolitan mite of the *Sarcoptidae* family, causes scabies. It is an oval, dorsally convex, ventrally flattened, eyeless mite that is small in size. The first pair of legs have suckers and claws, while the last pair of legs have long bristles (Dey, 2018). Adult mites have eight or four pairs of short legs divided into five ring-like segments, and setae on the body as well as the legs. There are no teeth on the hypostome of the mouthparts. The differences between adult male and female scabies mites are their small size and the presence of suckers on the last pair of legs. The first two pairs end in short stalks called pedicels, which terminate in thin-walled roundish structures often termed suckers. The female posterior two legs do not have suckers but end with long bristles. It is pale, disc-shaped, and the dorsal of the mite is covered with various small peg-like spines and a few bristles (setae). It has no distinct head, but the short and fat palps and pincer-like chelicerae of the mouthparts protrude anteriorly from the body (Service, 2008). Adult stage of *S. scabiei* sized 0.2-0.5 in length, the color is pale to clear appearance, no eyes, and two pairs located in front part of the body and two pairs located behind (Siagian *et al.*, 2020).

Sarcoptes sp. adults have short legs and round bodies, with visible dorsal spines and anal canals. Male suckers are not segmented on the first, second, and fourth pairs of legs, whereas females are on the first and second pairs of legs (Sharma *et al.*, 2018). *S. scabiei*'s detailed

morphology also revealed that the tarsi are long, unsegmented pedicels with bell-like caruncles. Caruncles are found on the anterior two legs of females and all four legs of males (Niedringhaus *et al.*, 2019).

The morphology *Notoedres cati* has a smaller size than *Sarcoptes scabiei*, does not have spines, and the location of the anus is dorsal, while *Sarcoptes scabiei* has a transverse and thorny outer skin, and the location of the anus is posterior (Fatma *et al.*, 2021). *Notoedres* differs from *Sarcoptes* in that it has a circular body, very short legs, and a dorsal anus (Ozukum *et al.*, 2019). The morphology *N. cati* has a circular body with small legs, with prolonged unjointed pedicels, a short square rostrum, sucker (caruncle) on legs 1 and 2 and a dorsal anus (Muñoz and Leon, 2021). *Sarcoptes scabiei* mites were discovered in a kitten. Red arrows pointed to suckers on the final pair of legs in figure 1.

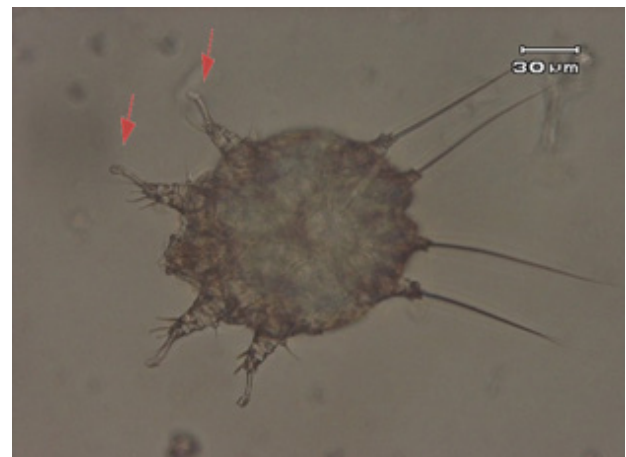


Figure 1. *Sarcoptes scabiei*, suckers on legs 1 and 2 (red arrows), observed under a microscope

Life cycle of *Sarcoptes scabiei*

The life cycle of *S. scabiei* completed in 14-21 days (Dey, 2018). Different observation methods, varying temperatures and relative humidity levels across the periods, and observation of scabies mites on various hosts may have contributed to the disparate reports of the length of the scabies mites' life cycles (Arlian and Morgan, 2017).

The development of *S. scabiei* was egg, larva, protonymph, tritonymph, and adult (Arlian and Morgan, 2017). The ongoing spread of scabies from an infected patient to an uninfected

one. The adult female mites need two weeks to fertilize with the male, after which the female burrows into the skin's stratum granulosum and lays four eggs per day for six weeks before dying. The egg develops into a larva in two to four days, protonymphs in three to four days after that, tritonymphs in two to three days later, and mature males or females in five to six days (Currier et al., 2012). Temperature, humidity, and mite strain are all environmental elements that have an impact on the mite's capacity to live outside of its host. The shortest survival is at temperatures below 0 °C and above 45 °C with relative humidity below 25%. Mites can endure cold temperatures for a long time (between 4 and 10 °C) (Niedringhaus et al., 2019).

Transmission

Sarcoptes scabiei has a wide host range including more than 150 species of wild and domestic mammals (Browne et al., 2022). Transmission between hosts starts with searching for the source of stimuli that originated from the host, such as heat and body odor emanating from the nearest host (Arlan and Morgan, 2017). Direct contact with an infested host may not be required during transmission. Mites can be transmitted via indirect contact with contaminated environments that facilitate their transmission. (Niode et al, 2022). All stages of mites after hatching, including free-living nymph and adult stages of female mites, can penetrate via the epidermis. This penetration is facilitated by enzymes that dissolved the skin and may occur

within 30 minutes after transmission (Kraabol et al., 2015).

Clinical Sign

Manifestation of sarcoptic mites are closely related to notredres mites and thus the two infestations have some similarity. Both infestations typically begin with a skin lesion, itchy crust, and scales on the ear margins (Morelli, 2021). Although sarcoptic mange cases in cats is rare, other case reported before share similar clinical characteristic including hair loss, crusted pododermatitis and crusty lesion on both concave and convex aspects of the pinnae, crusted lesion on the bridge of the nose, and crusted tail (Huang and Lien, 2013). These symptoms are probably related to physical irritation caused by burrowing and hypersensitivity reactions to mite excretory antigens that caused hyperplasia and hyperkeratosis in focal area (Malik et al., 2006).

Diagnosis

The basic diagnosis is based on itching and the finding of lesions at the classical sites. The diagnosis was confirmed by identifying mites and eggs in a skin scraping (Rosumeck et al., 2018). Skin tissue damage, fluid loss, allergic reactions, and subsequent bacterial infections were all side consequences of scabies (Kraabol et al., 2015). The scratching of the kitten's ears and legs was accompanied by hair loss, keratosis, and erythematous lesions, figure 3 displays it. Rectal temperature was 38,1 °C, and body weight was 0.94 kg.



Figure 3. (A) A kitten infected with *Sarcoptes scabiei* with lesions on the ear pinna; and (B) on the legs

Disease Management and Prevention

Cats are susceptible to parasitic, allergic, or other skin infections. The common signs of skin disease in cats include excessive licking, fur licking, redness and swelling of the skin, loss of fur, scaly, flaky skin, and bumps on the skin. A physical examination is needed to reveal the nature and pattern of skin disorders such as hair loss, redness, and the presence of parasites that can cause skin diseases (Alsaad et al., 2021).

Ivermectin should be administered right away for cases of epidemic skin illnesses for which we are aware of the etiology (Dey, 2018). Application of ivermectin along with supportive therapy is effective in treating cat scabies notoedris (Muñoz and Leon, 2021). The cases of nine cats positive for *S. scabiei* treatment to ivermectin injection at a dose of 400 mcg/kg body weight and diphenhydramine at 1 mg/kg body weight provide good effectiveness (Iqomah et al., 2020). The infected cat with *N. cati* was treated weekly twice via oral by four doses of ivermectin at 200 mg/kg body weight, and supportive therapy daily (2 ml of multi-vitamin and mineral syrup/Zincovit) successfully cured notoedric mange in cats (Sivajothi et al., 2015).

Cat maintenance management must be taken into consideration, particularly in caring communities to adopt domestic cats that are not cared for on the streets and kept at home, followed by animal owners' awareness of the health of their pets against scabiosis by taking preventive measures such as cleaning cages and play areas, separating or keeping infected cats from healthy cats, and maintaining animal health by visiting the veterinarian on a regular basis (Prasetyo et al., 2019). Other methods of preventing scabiosis include keeping the cage and cat habitat clean, collaring cats while they are receiving treatment to prevent them from scratching affected areas, and misting the cage with disinfectants (Fatma et al., 2021).

Conclusion

Scabiosis was 33.19% prevalent at the Pemalang Animal Health Center. *Sarcoptes scabiei* discovered the scabiosis parasite in domestic cats in an effort to treat and stop illness transmission to people. In Pemalang,

animal owners need to be managed and educated on preventive measures.

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