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Ectoparasite Infestation in Stray Cats at IPB Taman Kencana

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ABSTRACT

IPB Taman Kencana Campus is one of IPB's campuses located in the center of Bogor City. Its location within a public space and park area has led to an increase in the population of stray cats around this area. One problem found in stray cats on this campus is *ectoparasite infestation*. This study aims to investigate the presence of *ectoparasite infestation* in stray cats in the *IPB Taman Kencana* environment, Bogor. The study used 20 stray cats, consisting of 12 males and 8 females. The stray cats underwent physical examinations and ectoparasite identification. The results of the physical examinations showed that 100% of the stray cats were infested with ectoparasites, with more than one infestation or multiple infestations present. The percentage of ectoparasite infestation in stray cats in the *IPB Taman Kencana* environment was 100%, consisting of 90% infested with *Ctenocephalides felis* fleas, 55% infested with *Otodectes cynotis* mites, and 10% infested with *Sarcoptes scabiei* mites. Flea infestation was higher than mite infestation; this is caused by direct contact between infected cats. High flea infestation in stray cats causes anemia, low body condition score (BCS), thinness, stress, itching, dull hair, and baldness. Based on the results of the study, it was concluded that there was *ectoparasite infestation* in stray cats in the *IPB Taman Kencana* environment, with a high degree of infestation.

Keywords: Cat stray, ectoparasite, lice, flea, mite

INTRODUCTION

The IPB Taman Kencana Campus is one of the campuses owned by IPB University. It is located in Bogor City, specifically in the Bogor Tengah District. Its strategic location in the Taman Kencana area makes the IPB Campus both a tourist attraction and a cultural heritage site. The area surrounding the Taman Kencana Campus also serves as a public space and a popular culinary destination for residents of Bogor and visitors from outside the city (Widyawati 2017). The influx of visitors to this area has contributed to an increase in the feral cat population. The high density of feral cats leads to frequent direct interactions among them, facilitating the transmission of various diseases, one of which is *ectoparasite infestation* (Fauziyah et al. 2020).

Ectoparasites

are parasites that live on the external surface of their hosts, in this case, cats. The most common *ectoparasites* infesting cats include fleas, lice, mites, and ticks (Siagian 2022). *Ectoparasite infestations* are harmful to cats and can significantly reduce their quality of life. Adverse effects of *ectoparasite infestations* include anemia, dermatological problems (such as skin lesions and hair loss), allergic or hypersensitivity reactions, low body condition scores due to weight loss, itching, stress, discomfort, wounds, and—in severe cases—death (Siagian and Siregar 2022). Cats often experience persistent itching that leads to excessive scratching, resulting in skin sores, redness, and secondary infections. Some *ectoparasites* also serve as vectors for bacteria, viruses, and fungi, thereby worsening animal health. Moreover, many *ectoparasite*

species are zoonotic and can be transmitted to humans (Azam et al. 2023; Kamaruddin et al. 2022).

Ectoparasite infestations

in stray cats have been reported in several areas of Bogor City. Siagian (2022) reported a 100% prevalence of *ectoparasite infestation* in stray cats at IPB Gunung Gede Campus. Similar infestations have also been documented in Bogor Regency. Siagian and Fikri (2019) reported *ectoparasite infestations* in cats visiting the Starvet Animal Clinic

in Bogor Regency, while Siagian and Siregar (2022) documented infestations in cats treated at the Teaching Hospital, Faculty of Veterinary Medicine, IPB University. However, information regarding *ectoparasite infestations* in stray cats within Bogor City remains limited. To date, no studies have reported data on *ectoparasite infestations* in stray cats at IPB Taman Kencana Campus, even though such data are crucial due to the close interactions between humans and animals in this environment. Therefore, this study aimed to investigate the presence of *ectoparasite infestations* in stray cats at the IPB Taman Kencana Campus, Bogor. This research not only fills the existing scientific gap but also offers important practical and academic benefits. Scientifically, it contributes descriptive data on *ectoparasite* prevalence in an active urban environment, enriching parasitology and urban wildlife studies. Practically, the findings support the IPB Taman Kencana Campus and local authorities in designing appropriate interventions such as population control, monitoring, and *ectoparasite* prevention for stray cats. The identification of zoonotic *ectoparasites* also raises public health awareness regarding potential risks for residents and visitors. In addition, this study emphasizes the importance of animal welfare and provides baseline data for future research on *ectoparasite* ecology and management effectiveness in urban settings.

RESEARCH METHOD

The study was conducted at the IPB Taman Kencana campus in Central Bogor. Simple random sampling was used. The study used 20 stray cats from the area around Taman Kencana. The sample consisted of 12 males and 8 females.

Tools and materials

The tools used in this study were combs, ziplock bags, markers, spray paint, microscopes, slides, coverslips, blades, cotton, cotton buds, and dropper pipes. The materials used were 70% alcohol, 10% KOH, and ectoparasite samples.

A physical examination of feral cats was performed, examining them from head to tail. The physical examination was performed using inspection and palpation. The aim was to identify ectoparasite infestations in feral cats based on clinical symptoms and to identify ectoparasites such as fleas, ticks, ear mites, skin mites, and hair mites. Ectoparasite sampling was performed after the physical examination. Feral cats that had been examined and had ectoparasite samples taken were marked with colored spray paint on their heads and documented with photographs. This head tag served to identify feral cats that had been examined (Siagian 2022).

Skin sampling and examination aims to identify skin mites such as Sarcoptes scabiei and Cheyletiella sp. Skin sampling is performed using the skin scraping method. The skin scraping method uses a blade. The skin scraping procedure involves scraping the skin of an animal suspected of being infested with mites with a blade until it bleeds. The sample is placed on a glass slide and 1-2 drops of 10% KOH solution are added, then homogenized. The specimen is covered with a coverslip and left for 1 minute. The 10% KOH solution separates debris from the mites and thins the chitin of the mites, allowing

them to be clearly observed. The specimen is examined under a microscope at 400x magnification (Siagian 2022).

Hair sampling and examination aims to identify Lynxacarus radovskyi hair mites and Felicola subrostratus hair mites. Ectoparasite-infested hair samples were taken and placed on a glass slide, then added with 1-2 drops of 10% KOH solution and covered with a coverslip. The sample preparations were examined under a microscope at 400x magnification (Siagian and Fikri 2019).

Flea Sampling and Examination

Flea sampling is performed using a comb or alcohol swab. Alcohol swabs are swabs soaked in 70% alcohol. The purpose of applying alcohol swabs is to stun the fleas, making them easier to remove. The flea examination procedure involves placing the stunned flea on a glass slide, adding a drop of 10% KOH, and covering it with a coverslip, then leaving it for 1 minute. The sample slide is examined under a microscope at 4x magnification (Siagian 2022).

Ear mite sample examination is carried out by taking earwax samples. The goal is to identify the ear mite *Otodectes cynotis*. The ear mite examination procedure is that earwax is taken using a cotto bud and placed on a glass object. The earwax sample was given 1-2 drops of 10% KOH solution and homogenized and then covered with a glass cover. The sample preparation was examined with a microscope with a magnification of 400 times (Waljannah and Siagian 2021).

The results of the physical examination and ectoparasites that have been examined microscopically were analyzed quantitatively and qualitatively. Quantitative analysis using percentages and the results are descriptive qualitatively.

$$Percentage\ (\%) = \frac{Total\ of\ positive\ Cats}{Total\ of\ cats\ examined}$$

RESULTS AND DISCUSSION

The results of physical examinations on stray cats in the IPB Taman Kencana Campus environment showed that 20 wild cats were infested with ectoparasites (Table 1). This means that all cats that live wild in the IPB Taman Kencana Campus environment are infested with ectoparasites. Some of these feral cats are infested with ectoparasites with more than 1 type of ectoparasite which shows a variety of ectoparasitic variations in 1 cat. The percentage of ectoparasitic infestations of more than one in wild cats in the IPB Taman Kencana Campus environment is 50%. The types of ectoparasites found are the Ctenocephalides felis pinjal, the ear mite *Otodectes cynotis*, and the skin mite Sarcoptes scabiei. The percentage of ectoparasitic infestations in feral cats in the IPB Taman Kencana Campus environment is 100%, including 90% infested with Ctenocephalides felis, 55% with *Otodectes cynotis* mites, and 10% with Sarcoptes scabiei mites (Figure 1).

Table 1. Results of ectoparasite identification in wild cats at IPB Taman Kencana Campus

Cat	Mite				Kutu *(Felicola subrostratus)*	Pinjal *(Ctenocephalides felis)*
	Otodectes cynotis	*Sarcoptes Scabiei*	*Lynxacarus radovskyi*	*Cheyletiella sp*		
1	+	-	-	-	-	+
2	+	-	-	-	-	-
3	-	-	-	-	-	+
4	-	-	-	-	-	+
5	-	-	-	-	-	+
6	+	-	-	-	-	+
7	+	-	-	-	-	+
8	-	-	-	-	-	+
9	+	-	-	-	-	+
10	+	-	-	-	-	+
11	-	-	-	-	-	+
12	-	-	-	-	-	+
13	+	-	-	-	-	+
14	-	-	-	-	-	+
15	+	+	-	-	-	-
16	+	+	-	-	-	+
17	+	-	-	-	-	+
18	-	-	-	-	-	+
19	+	-	-	-	-	+
20	-	-	-	-	-	+

Source: Research data (2025)

Figure 1. Results of microscopic identification of ectoparasites in stray cats at the IPB Taman Kencana Campus. With 400 times magnification. (a). Mite Sarcoptes scabiei. (b). Pinjal Ctenocephalides felis. (c). Mite *Otodectes cynotis*.

Source: Researcher's documentation (2025)

Table 1 shows that the infestation of Ctenocephalides felis in wild cats at the IPB Taman Kencana Campus shows a fairly high value of 18 cats positive for scabies, when compared to the mite infestations *Otodectes cynotis* and Sarcopites scabiei. The

infestation of Ctenocephalides felis is higher than that of mites, this is because Ctenocephalides felis is very easy to transfer from one cat to another if there is direct contact between infected cats. The Ctenocephalides felis pinjal has long hind legs to jump, and the resilin protein on the hind legs allows the hind leg to jump from one cat host to another efficiently (Siagian et al. 2023).

Ctenocephalides felis is a parasite that is often found in cats, but it can infestation cats and other animals including humans. Cats affected by the bite of Ctenocephalides felis can experience intense itching and are subsequently characterized by skin discoloration to redness, irritation and can become wounds. In addition, cats will experience hair thinning in the area of the pinjal bite (Purwa and Ardiansyah 2021; Clark et al. 2018). Nail infestation is the cause of dermatitis or a typical skin disorder known as flea allergic dermatitis (FAD) (Sigit and Hadi 2006). Ctenocephalides felis plays a role as a host between the tapeworms Dipylidium caninum that cause Dipylidiasis disease (Maina et al. 2016 in Ayuni et al. 2024).

Wild cats infected with pear can occur due to unclean or contaminated environmental conditions, dense populations of feral cats and direct interaction between feral cats (Herliana et al. 2024). Pinjals can jump as far as 33 cm or 10 times their body height horizontally from one host to another. Ctenocephalides felis is easy to breed in an environment that supports it to reproduce. Pinjal Ctenocephalides felis based on its cycle is included in the complete metamorphosis, namely from eggs, larvae, pupae and adults (Siagian 2022; Fauziyah et al. 2020). Female Ctenocephalides felis will lay her eggs in a nest-like environment. These eggs will hatch into larvae which then develop into pupae in the surrounding environment. Wild cats that come into contact with or sleep in the same place as an infested cat can be exposed to eggs, larvae or pupae in the environment where the cat is located (Rust 2017).

Ctenocephalides felis can adapt and survive to a variety of environmental conditions (Lestari et al. 2020). Genchi et al. (2000) reported that the Ctenocephalides felis can survive at temperatures of 13-350C. This statement is in accordance with the opinion of Prior and Stich (2014) in Siagian et al. (2023) who stated that Pinjal Ctenocephalides felis can adapt to various conditions and its spread is cosmopolitan with its main host, namely cats.

Otodectes cynotis mite infestation in stray cats at the IPB Taman Kencana Campus was 55% of the population examined. This is due to the nature of the *Otodectes cynotis* mite which is highly contagious through direct contact with other infected cats. Dirty and humid environmental conditions, low immune systems, especially in kittens, and stress can also increase the risk of infesting these ear mites (Saputra et al. 2023). The impact of the *Otodectes cynotis* mite infestation causes cats to scratch their ears, severe irritation, itching, cats tilting their heads, and ear inflammation (otitis). The long-term and chronic impacts are secondary infections, othematoma and permanent damage to the cat's ears (Amir et al. 2020).

The *Otodectes cynotis* mite has an oval or oval morphology with a size of 500-800 μm. The *Otodectes cynotis* mite has 4 pairs of legs and is protruding. The length of his legs exceeded his body size. The 3rd and 4th pair of legs have an outright (satae) on female *Otodectes cynotis*. This is different from the male *Otodectes cynotis* where the four pairs of legs end in caranculae (Al khafaji and Al Musawi 2025; Wilhelm et al. 2025).

The *Otodectes cynotis* mite lives in the moist, warm ear canal, feeding on skin cells, blood, and earwax. Her life cycle from egg to adult takes about 11-16 days, and females can live up to 40 days. The eggs of the *Otodectes cynotis* mite will hatch in 1-5

days and become six-legged larvae. The larvae develop into eight-legged nymphs and will then become adults (Permana et al. 2023). Metamorphosis of the mite *Otodectes cynotis* is an incomplete metamorphosis. These mites are transmitted through direct contact with infected animals or a humid and dirty environment. Temperature and humidity in the cat's ears are predisposing factors for the presence of *Otodectes cynotis* mites. Another factor is ear hygiene and the surrounding environment. Cat ears that are rarely cleaned can cause the mite to spread easily and develop quickly (Abdillah et al. 2024). This mite infestation in cats causes pruritus, the animal often scratches the itchy parts of the body, and the ear cerumen is dark black. High infestation of *Otodectes cynotis* can cause otitis (Bowman et al. 2002).

The infestation of Sarcoptes scabiei mites in wild cats in the IPB Taman Kencana Campus environment is the lowest infestation when compared to Pinjal Ctenocephalides felis and *Otodectes cynotis* mites. This is because the transmission of these mites occurs if they come into direct contact with cats that have been infected with this mite and contaminated objects (indirectly). Transmission can occur between cats or other animals, including humans (zoonoses). Infected cats will release mites that can move to their new host or objects around them (Maslim and Batan 2021; Waljannah and Siagian 2021).

The Sarcoptes scabiei mite is one of the mites of the family Sarcoptidae. The morphology of this mite is that its body is round and has 4 pairs of legs in adults, while 3 pairs of legs are for larvae. The legs of the 3rd and 4th pair of Sarcoptes scabiei mites are attached to its body. The female Sarcoptes scabiei mite measures 300-504µm long and 230-420µm wide. The male Sarcoptes scabiei mite measures 213-285 µm long and 162-210µm wide. The life cycle of Sarcoptes scabiei consists of four stages: egg, larvae, nymphs, and adults, all of which occur inside the host. Adult female mites dig into the skin to lay eggs, which then hatch into larvae in 3–4 days (Wahdini and Sungkar 2023; Niedringhaus et al. 2019). The larvae develop into nymphs, which then molt into adult multiplying mites, with a complete cycle of about 10–15 days or less than three weeks. Adult mites mate on the surface of the skin or in the burrows. Fertile female mites will continue to dig burrows and lay eggs throughout their lives, which can last about 1–2 months (Setyaningrum et al. 2016; Sigit and Hadi 2006).

Transmission from one individual to another generally occurs through skin-to-skin contact. An adult female mite that has been fertilized will move to the surface of the host's skin in search of a burrow and begin a new cycle (Thomas et al. 2000). The Sarcoptes scabiei mite digs tunnels in the cat's skin layer to lay eggs and this activity causes severe itching (Arlian and Morgan, 2017). The symptoms that arise when cats are affected by scabies are that cats often scratch parts of their bodies due to intense itching. The manifestation of Sarcoptes scabiei mites on the skin will cause skin lesions in the form of erythema, macula, and papules. Severe lesions will form scabs in some parts of the body such as in the ear area, face, elbows, fingers, and around the genitals (Taylor et al, 2007). The consequences are in the form of baldness (alopesia) and lesions on the skin that dry and harden and become scabs, these lesions will quickly spread throughout the body along with the degree of mite infestation. Affected animals experience a decrease in body condition, causing a negative impact on keepers and the environment due to their zoonotic nature (Indah et al. 2023).

CONCLUSION

All stray cats at IPB Taman Kencana Campus were found to have ectoparasite infestations, with 100% prevalence detected through physical and microscopic

examinations. The main ectoparasites identified were *Ctenocephalides felis* (90%), *Otodectes cynotis* (55%), and *Sarcoptes scabiei* (10%), with flea infestations being the most common due to easy transmission via direct contact. This high ectoparasite burden poses risks to animal health and public hygiene in the area. It is recommended to establish regular monitoring and control programs, improve environmental sanitation, and raise community awareness about stray cat interactions to mitigate these risks. Future research could focus on evaluating the effectiveness of different ectoparasite control strategies and assessing the zoonotic transmission potential of these parasites in urban settings.

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