



Diagnosis and Treatment of Demodicosis in Pet Dogs with Dermatological Lesions by Amitraz in Tabriz, Iran

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Abstract

Introduction: *Demodex* is a tiny parasite (smaller than one millimeter) that can sometimes cause a skin disease called Demodicosis in dogs and cats. Demodicosis in dogs is created by three species of mites called *Demodex canis*, *Demodex injai*, and *Demodex cornei*. The most common mite-causing demodicosis in dogs is *D. canis*. This mite lives in hair roots and sometimes in sebaceous glands, where they feed on cells.

Methods: This study was conducted on 200 pet dogs aged one month to 9 years referred to veterinary clinics in Tabriz, Iran, who had clinical symptoms of dermatological lesions from November 2021 to November 2023. Skin samples were taken through skin scrapings, and in the laboratory, first, these samples were clarified using potassium hydroxide 10% and lactophenol and then examined by a microscope. Finally, 10 dogs infected with *Demodex* mange were isolated and treated twice daily with Amitraz as a spray prepared from poison powder for one week.

Results: In this study, out of 200 dogs tested during 2 consecutive years 2021–2023, 10 (5%) were infected with *Demodex* mange. The highest rate of prevalence of demodicosis in pet dogs in Tabriz was found in dogs under 2 years old 7 (70%), while the lowest rate of demodicosis was observed in dogs aged 2–4 years 1 (10%). The prevalence of demodicosis in pet dogs in Tabriz was higher in female dogs (n=7, 70%) than that in male dogs (n=3, 30%). The results of this study revealed that the drug Amitraz could kill *Demodex* 100% in dogs.

Conclusion: In this study, it was found that the drug Amitraz is able to destroy 100% *Demodex* in pet dogs. Thus, this is an effective drug against *Demodex*.

Keywords: Demodicosis, Pet dogs, Amitraz, Tabriz, Iran

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Introduction

Demodex is a tiny parasite (smaller than one millimeter) that can cause a skin disease called Demodicosis in dogs and cats. *Demodex* is an acarina and is classified into the family of mites (e.g., *Sarcoptes*). Demodicosis is more common in dogs than in cats, but the species causing the disease is different in dogs and cats. Demodicosis in dogs are created by three species of mites called *Demodex injai*, *Demodex canis*, and *Demodex cornei*. *Demodex canis* is the most common mite causing demodicosis in dogs (1). This mite lives in hair roots and occasionally in sebaceous glands, where they feed on cells and finish their life cycle process entirely on animal skin. *D. canis* can be found naturally on the dog's skin in small amounts (2). These mites are usually transmitted to the puppy through the mother's skin after birth. Each animal has its own mite, and dog and cat mites are not transmitted to humans. If there are conditions that weaken the body's immune system (e.g., immunodeficiency diseases, cancer, hormonal disorders, internal diseases, improper nutrition, food poverty, the use of corticosteroid drugs, or chemotherapy), then these parasites living on the skin have the opportunity to multiply and cause disease (3).

Depending on the age of onset of the disease, it is divided into demodicosis in young and adult dogs. The main cause of demodicosis is not well defined, but it is believed that hereditary factors and immune system disorders are important causes of this disease (4). In addition, the juvenile form can be caused by stress, intestinal parasites, and improper maintenance. Some breeds of dogs can be more sensitive to demodicosis; however, any breed, whether pure or hybrid, may suffer from this disease. Rottweilers, pit bull terriers, English bulldogs, Shar-Pei, and the like can be mentioned among the breeds prone to this disease (5).

Clinical Symptoms of Canine Demodicosis

Depending on the type of mite that causes this disease, its symptoms can be somewhat different. Since the most common causative agent in most cases is *D. canis*, the local form of Demodicosis is mostly found in the form of small bald areas on the hands, feet, head, face, and trunk of the body. Considering that this mite attacks the hair root, it can cause baldness. The other common symptoms of this disease include skin peeling, red pimples, small black grains, and redness, darkening, or



increased skin thickness. Demodicosis itself can be itchy or non-itchy, but if a secondary microbial infection occurs, the probability of the disease becoming itchy will be extremely higher. Sometimes, *D. canis* can only infect the ears without affecting the other parts of the body. Symptoms related to the ear or excessive discharge of earwax can be detected in these cases (6).

Diagnosis of Demodicosis in Dogs

The most common methods of diagnosing demodicosis in dogs are shaving a part of the skin or pulling hair from the root and examining it under a microscope. Of course, there are other methods, such as sample preparation by adhesive tape, examination of secretions, and biopsy, which are less frequently used (7).

Treatment of Demodicosis in Dogs

Veterinarians usually use topical disinfectants (e.g., 1% chlorhexidine) or topical antibiotics for wound areas. Diseases such as widespread bacterial infections, as well as fungi such as dermatophytosis, acne, and some autoimmune skin diseases can also cause symptoms similar to demodicosis, and the veterinarian must differentiate between these diseases. The most common drug utilized to treat disseminated demodicosis is Amitraz. It is better to wash short dog and animal hair with antibacterial shampoo before use. This solution can be applied to the animal's body with a sponge while washing, and the animal can be immersed in the solution. Before using Amitraz, you must read the instruction manual carefully (8).

Materials and Methods

This study was conducted on 200 pet dogs aged one month to 9 years referred to veterinary clinics in Tabriz, Iran, who had clinical symptoms of dermatological lesions from November 2021 to November 2023. The demographic information of the dogs was collected by a designed questionnaire that included the animal's age, gender, breed and body hair condition, diet, use of antiparasitic drugs, sampling season, and a history of skin itching in dogs and dog owners.

Skin samples were taken through skin scrapings, and in the laboratory, these samples were first clarified using *potassium hydroxide* 10% and lactophenol and then examined by a microscope (Figure 1). Finally, 10 dogs infected with *Demodex* mange were isolated and treated twice daily with Amitraz as a spray prepared from poison powder for one week (9).

Results

In this study, out of 200 dogs tested during 2 consecutive years 2021-2023, 10 (5%) were infected with *Demodex* mange (Table 1). The highest and lowest prevalence rates of demodicosis in domestic dogs in Tabriz were found in

dogs under 2 (n=7, 70%) and 2-4 (n=1, 10%) years old, respectively (Table 2). The prevalence of demodicosis in pet dogs in Tabriz was higher in female dogs (n=7, 70%) than in male dogs (n=3, 30%), the related data of which are provided in Table 3. In this study, it was found that Amitraz was able to kill *Demodex* 100% in dogs; therefore, this drug is effective against *Demodex* (Table 4).

Discussion

Ectoparasites use dogs as a place to feed and reproduce. Fleas, ticks, lice, and scabies depend on feeding from the host to survive and complete the life cycle (10,11). Fleas



Figure 1. *Demodex canis* Under a Light Microscope

Table 1. Prevalence of Demodicosis in Pet Dogs in Tabriz, 2021-2023

Number of Dogs with Skin Lesions	Number of Positive Cases for Demodicosis out of 200	Prevalence of Demodicosis in Dogs (%)
200	10	4 (5%)

Table 2. Prevalence of Demodicosis in Pet Dogs of Tabriz According to Age (n=10)

Age Groups	Number of Infected Dogs	Percent
Up to 2 years	7	70
2-4 years	1	10
>4 years	2	20
Total	10	100

Table 3. Prevalence of Demodicosis in Pet Dogs of Tabriz According to Gender (n=10)

Gender	Number Affected	Percent
Female	7	70
Male	3	30
Total	10	100

Table 4. The Effectiveness of Amitraz in the Treatment of Demodicosis in Pet Dogs in Tabriz (100%)

Number of Demodicosis Positive Cases out of 200	Prevalence of Demodicosis in Dogs Before Treatment (%)	Prevalence of Demodicosis in Dogs After Treatment (%)
10	10 (5%)	0 (0%)

play a role in the transmission of pestilence from dogs to humans and do not act only as intermediate hosts for cestodes (12). Mites *Sarcoptes scabiei* and *Otodectes cynotis* can cause itchy skin lesions in humans (13,14). Considering the keeping of training animals, especially dogs, in homes, and the proximity of these animals to humans, and the fact that dogs can be reservoirs for external parasites, helminths, and protozoa, this study aimed to diagnose and treat demodicosis in pet dogs with skin lesions using Amitraz in Tabriz, Iran. In this study, out of 200 dogs examined, 10 dogs had *Demodex dermatitis* (5%). After the effect of the amitraz drug spray, the number of dogs infected with *Demodex* decreased to zero, and 10 dogs were completely free of *Demodex* scabies. The findings of this study indicated that Amitraz is a suitable drug to eliminate *Demodex*. In studies conducted by Garedaghi and Sheikhi Eskoi and on guard dogs in Tabriz in 2020, the contamination rate of guard dogs with *D. canis* and *S. scabiei* was 2% and 4%, respectively (14,15). In another study performed by Mosallanejad on dogs in Ahvaz, the animals were only infected with *S. scabiei* (7.14%) (16). However, Jamshidi et al reported the infection of dogs with *D. canis* (2.1%) and *S. scabiei* (21%) in Tehran (17), which is not consistent with our study results. In the study by Chee et al (18), it was reported that dogs in South Korea were infected with *D. canis* (4.9%) and *Sarcoptes scabiei* (19.4%), which conforms to our study results. Similarly, dogs infected with *D. canis* (3.1%) and *Sarcoptes scabiei* (1.5%) were reported in Brazil (19). These differences in the prevalence of *D. canis* can be due to seasonal conditions, geographic region, inherent resistance of dogs, differences in the age of infection of animals, and the diet and breed of infected dogs (20).

Conclusion

The findings of this study demonstrated that Amitraz could destroy 100% *Demodex* in pet dogs, so it is an effective drug against *Demodex*.

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Competing Interests

The authors declare that they have no conflict of interests.

Ethical Approval

Ethical considerations have been fully observed in this study.

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