

A case report of *Cheyletiella* infestation on a Whippet dog in Korea

Sung-Shik SHIN

*Division of Veterinary Parasitology College of Veterinary Medicine,
Chonnam National University, Kwangju 500-757, Korea*

Abstract: A clinical case of *Cheyletiella* infestation on a dog born and raised in Korea is reported. A three-year old female Whippet was hospitalized due to a multiple fracture and displacement of the left scapula caused by a recent car accident. The mite infestation was not noticed at the time of hospitalization. The dog underwent multiple operations involving internal fixation of the fractured scapula with wire and a plate, followed by extensive chemotherapy with antibiotics and prednisolone. After two months of hospitalization, a pruritic dermatitis near the left scapula developed. Multiple white dandruff-like flakes were seen on the hair coat, especially over the dorsal spine and neck, and the dog expressed increased pruritus by frequently licking and scratching the affected areas. Local dense accumulations of skin debris that became crusty were also observed. Microscopic examination of a skin scraping revealed a heavy infestation of *cheyletiella yasguri*, as identified by the presence of hooks of the palpi and the heart-shaped sensory organ on genu I. Immunosuppression elicited by the extensive administration of prednisolone was suspected for the initiation of the generalized mite infestation.

Key words: *Cheyletiella yasguri*, dandruff mite infestation, Whippet dog, immunosuppression

INTRODUCTION

Genus *Cheyletiella* Canestrini, 1885 (Cheyletidae, Acari) are large mites that affect cats, dogs, rabbits, and human beings, causing a mild, non-suppurative dermatitis on affected patients. Although three species in genus *Cheyletiella* (*C. yasguri*, *C. blakei*, and *C. parasitovorax*) are commonly recognized with a relatively low host specificity, *C. yasguri* is considered the species of dogs; *C. blakei*, the species of cats; and *C. parasitovorax*, the species of rabbits (Muller *et al.*, 1989). The identification of several cases of dermatitis in

humans, due to *Cheyletiella* spp. infestation, implies that the mite is also of public health importance (Cohen, 1980; Bronswijk and De Kreek, 1976; Powell *et al.*, 1977; Shelley *et al.*, 1984).

Of the three *Cheyletiella* species, *C. yasguri* elicits scurfy dandruff with pruritus in two- to eight-week-old puppies. Older dogs may be almost symptomless carriers. Although dermatitis of dogs due to other mite infestations such as *Sarcoptes scabiei*, *Otodectes cynotis*, or *Demodex canis*, have been reported in Korea (Park *et al.*, 1996, Lee *et al.*, 1992), *Cheyletiella* mite infestation has not previously been documented in dogs. We report a case of scurfy dermatitis due to *Cheyletiella yasguri* infestation on a Whippet.

• Received Nov. 9 1996, accepted Nov. 28 1996

*Corresponding author (e-mail: sungshik@chonnam.chonnam.ac.kr)

CASE DESCRIPTION

A three-year old female Whippet was admitted on March 12, 1994 to the Teaching Hospital of the College of Veterinary Medicine, Chonnam National University. The dog's admission to hospital followed a multiple internal fracture and displacement of the left scapula, caused by a car accident the previous night. The dog was not able to walk, although she could stand on her foot. She was fully alert and had a normal appetite and body temperature. After the accident, bloody feces and urine were noticed by the owner. The mite infestation was not noticed at the time of hospitalization. The dog underwent an osteosynthesis involving internal fixation of the fractured scapula with wire and a plate on March 18 and was discharged from the hospital on March 23. On March 29, the dog was re-hospitalized and underwent another operation on the identical site due to a second fracture caused by excessive exercise. The dog was finally discharged on May 16 with successful healing of the fractured scapula.

While in hospital, the dog received extensive chemotherapy with antibiotics (enrofloxacin, 75 mg/day) and prednisolone acetate (20 mg/day) every day for two months. Two months after the initial hospitalization, a pruritic dermatitis was observed on her back and near the left scapula on which the operation was performed. Multiple white dandruff-like flakes were observed on the hair coat, especially over the dorsal spine and the neck (Fig. 1A). The dog expressed increased pruritus by frequently licking and scratching the affected areas. Local dense areas of accumulated skin debris that became crusty were also observed. Upon close examination of the affected area, an extensive accumulation of dandruff at the basement of the hair was recognized (Fig. 1B). The size of affected area on the back was approximately 30 cm long by 17 cm wide. Regular microscopic examination of a skin scraping from the affected area with mineral oil revealed a heavy infestation of mites at various stages of development. The number of mites from each skin scraping of three different areas that covered approximately 2 cm long by 1 cm wide each exceeded 35, which included larva, nymphs and adults of both sexes.

Adult female mites were 500 ± 15 by $320 \pm 12 \mu\text{m}$ in size (mean \pm standard deviation, based on the measurement of 10 representative adult female mites), with four pairs of legs bearing combs instead of claws (Fig. 2). The body was saddle-shaped, and the gnathosoma was short and broad with robust palpi. The palpi terminated in prominent hooks, the most diagnostic feature of the genus *Cheyletiella*. The sensory organ on genu I was heart-shaped, which typified *C. yasguri* (Fig. 3A). Mites captured at the moment of ecdysis were commonly found. The elongated eggs were 220 ± 12 by $120 \pm 15 \mu\text{m}$ in size, based on the measurement of 10 representative eggs. Some eggs contained differentiated embryos, forming processes that became palpi, mouthparts, and legs. Many of the shells of the eggs were covered with a finely woven thread, probably used by the female mites to fix themselves to the hair of the host.

The dog was given medicated baths with

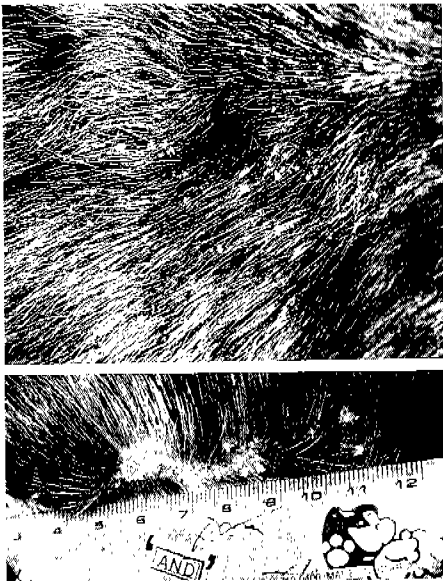


Fig. 1. Scurfy dermatitis of a three-year old female Whippet. Multiple white dandruff-like flakes on the hair coat (A) and a local dense area of accumulated skin debris caused by the infestation with *Cheyletiella yasguri* (B).

A

B

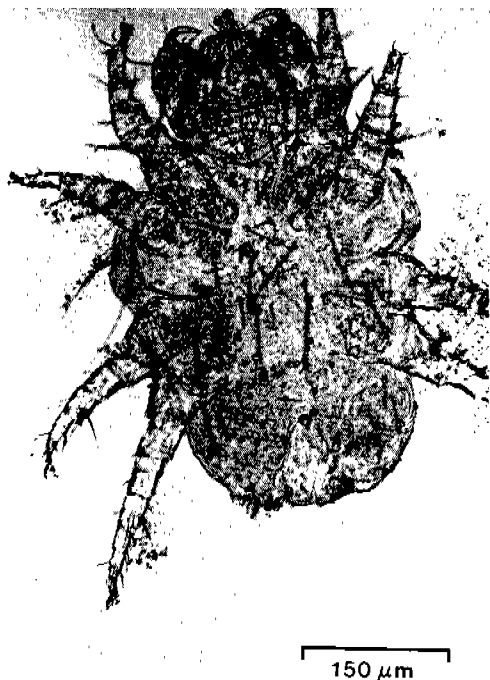


Fig. 2. A ventro-dorsal view of an adult female *Cheyletiella yasguri* mite. Note the four pairs of legs bearing combs instead of claws and the palpi terminated in prominent hooks.

amitraz (Greentix, Green Cross Veterinary Pharmaceutical Co., Korea) once weekly for three weeks, and one intramuscular injection of ivermectin (300 μg/kg) was administered. These measures cleared the mite infestation.

DISCUSSION

This is the first-reported clinical case of *Cheyletiella dermatitis* on a dog in Korea. It is possible that the mite may have affected more dogs in Korea, but the relatively mild nature of pruritus caused by *Cheyletiella* infestation may be easily overlooked by pet owners. Since the mite is easily destroyed by most insecticides, owners probably eliminate many cases unknowingly by treating the itchy pet with flea powder or shampoo.

The Genus *Cheyletiella* differs from other mites of medical importance by the presence of accessory mouthparts or palpi that terminate in prominent hooks (Foxy and Ewing, 1969). Although a new species of *Cheyletiella* (*C. dengi*) from Xinjiang, China was recently reported (Hu and Hou, 1992), three species are commonly found among domesticated animals and humans; *C. yasguri*, *C. blakei*, and *C. parasitovorax*. These three species differ morphologically from each other in that *C.*

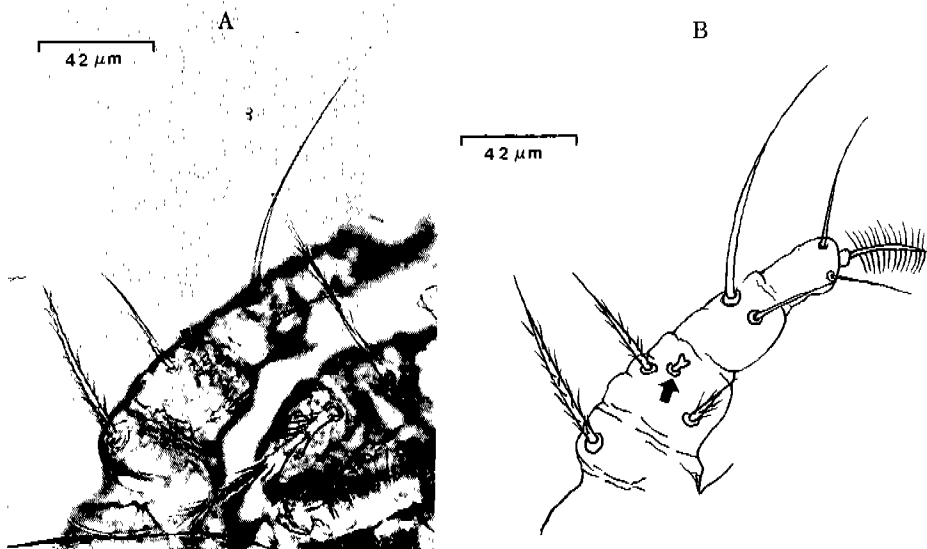


Fig. 3. The genu I of a female *Cheyletiella* mite. A: The heart-shaped sensory organ (arrow) which typified *Cheyletiella yasguri*. B: Artist's sketch of the genu I of a female *Cheyletiella yasguri* with the heart-shaped sensory organ (arrow).

yasguri has one large, dorsal trapezoid propodosoma shield and two small, round plates, while *C. parasitovorax* has only one large dorsal shield (Muller *et al.*, 1989). *C. blakei* does not have the dorsal propodosoma shield. The most diagnostic feature in differentiating the three species, however, is the shape of the sensory organ on genu I. The sensory organ of *C. yasguri* on genu I is heart-shaped (Fig. 3B), that of *C. blakei* is cone-shaped, and that of *C. parasitovorax* is global-shaped (Foxx and Ewing, 1969).

Since little is known about the prevalence of *Cheyletiella* mite infestation among dogs in Korea, the ethiology of the infection is not clear. Considering that the Whippet is not a native Korean breed, the mite could have been imported into Korea with the dog's ancestors. The infected dog in this report, however, was born and raised in Damyang, Chollanam-do, and had never been abroad. In an effort to find other infected dogs, we visited the farm of the owner who had several other adult dogs. We examined skin scrapings from three dogs which had been raised outdoors individually, but failed to find any mite infestations.

Unlike *Sarcoptes scabiei* which can cause clinical dermatitis in adult dogs, *Cheyletiella* infestation is most severe and generalized in 2- to 8-week-old puppies (Muller *et al.*, 1989). Older dogs may be almost symptomless carriers. It is therefore of interest to consider why the three-year-old dog in this report showed a clinical manifestation of the disease. Although the dog was hospitalized for two months, it is unlikely that she contacted the parasite while she was in the hospital. The basis for this assumption is that the Teaching Hospital at the College of Veterinary Medicine, Chonnam National University has not observed a case of cheyletiellosis either before or since. It is more likely that the dog was a symptomless carrier of the disease. Factors contributing to the dog's generalized mite infestation might include the stress that the dog experienced by the car accident, the two-months of hospitalization, and particularly, the extensive two-month therapy with prednisolone which might have suppressed the dog's immune system.

The combination of medicated baths with

amitraz and intramuscular injection of ivermectin successfully eliminated the mite infestation from the dog. However, the mite can be easily destroyed by most insecticides such as carbaryl, malathion, or lindane that are present in most flea shampoos. Although mites usually do not live more than 48 hours off the host, disinfection of premises is recommended because of the zoonotic nature of the disease (Powell *et al.*, 1977, Shelley *et al.*, 1984) and because a few mites may live as long as 10 days off the host (Muller *et al.*, 1989).

Although causes of human cheyletiellid dermatitis have been associated with cats (Davies, 1941, Fernström and Gentele, 1960, Fox and Reed, 1978, Moxham *et al.*, 1968) and dogs (Cohen, 1980, Shelley *et al.*, 1984, Bakkers and Fain, 1972), the owner of the dog in this report did not develop dermatitis. Since the dog was raised outdoors for hunting purposes, direct contact with the owner was probably limited.

REFERENCES

- Bakkers EJ and Fain A (1972) Dermatitis in man and in a dog caused by the mite *Cheyletiella yasguri* Smiley. *Br J Dermatol* **87**(3): 245-247.
- Bronswijk JE and De Kreek EJ (1976) *Cheyletiella* (Acari: Cheyletiellidae) of dog, cat and domesticated rabbit, a review. *J Med Entomol* **13**(3): 315-327.
- Canestrini G (1884-85) *Prospetto dell'acarofauna italiana*. Part 2. Famiglie: Erythraeini, Cheyletini Bdeleini, Eupodini e Analgesini. *Atti R. Ist. Veneto sc., Lett. ed Arti, Series 6*. **3**(2): 1647-1688.
- Cohen SR (1980) *Cheyletiella* dermatitis. A mite infestation of rabbit, cat, dog, and man. *Arch Dermatol* **116**(4): 435-437.
- Davies JHT (1941) Cat itch: *Cheyletiella* and *Notoedrus* [sic] compared. *Brit J Dermatol* **53**: 18-24.
- Fernström AJB and Gentele H (1960) Dermatitis caused by mites living on cats. *Acta Paediatrica* **49**: 752-753.
- Fox JG and Reed C (1978) *Cheyletiella* infestation of cats and their owners. *Arch Dermatol* **114**(8): 1233-1234.
- Foxx TS and Ewing SA (1969) Morphologic feature, behavior, and life history of *Cheyletiella yasguri*. *Am J Vet Res* **30**(2): 269-

285.
 Hu JD and Hou G (1992) On the morphology of the genus *Cheyletiella* and description of a new species from Xinjiang China Acari Cheyletiellidae. *Acta Zootaxonomica Sinica* **17**(2): 183-188.

Lee CY, Lee CG, Seo GW (1992) Studies on the contact infection of canine demodicosis. *Korean J Vet Res* **32**: 407-412.

Moxham JW, Goldfinch TT and Heath AC (1968) *Cheyletiella parasitovorax* infestation of cats associated with skin lesions of man. *N Z Vet J* **16**(4): 50-52.

Muller GH, Kirk RW, Scott, DW (1989) Small Animal Dermatology, 4th ed. p369-376. W. B. Saunders Company, Philadelphia.

Park GS, Park JS, Choi BK, Lee WK and Cho JH (1996) Mite infestation rate of pet dogs with ear dermatoses. *Korean J Parasitol* **34**(2): 143-150.

Powell RF, Palmer SM, Palmer CH, Smith EB (1977) *Cheyletiella dermatitis*. *Int J Dermatol* **16**(8): 679-682.

Shelley ED, Shelley WB, Pula JF, and McDonald SG (1984) The diagnostic challenge of nonburrowing mite bites. *Cheyletiella yasguri*. *JAMA* **251**(20): 2690-2691.

=초록=

Whippet종 개에서의 *Cheyletiella yasguri*(진드기목: 발톱진드기과) 감염증례 보고

신성식

전남대학교 수의과대학 기생충학교실

국내산 개에서의 *Cheyletiella* 종진드기에 의한 피부염 1례를 보고한다. 환견은 3년생 Whippet 종 암컷으로서 자동차사고로 인해 좌측견갑골의 복합골절 및 전위가 일어나 입원하였다. 입원한 직후 실시한 전신검사서 종진드기에 의한 피부염은 관찰되지 않았다. 환견은 두 차례에 걸친 골절부위의 골집합수술을 받았으며 입원한 두 달 동안 매일 항생제와 prednisolone요법을 받았다. 입원한 지 두 달 후 좌측견갑골 부위의 피부에 소양성 피부염이 발생하였으며, 특히 등 및 목부위에 다량의 인설이 관찰되었다. 약 2-5 mm 정도 두께의 인설층이 목 및 등의 피모 기저부에 형성되어 있었으며 인설과 피부소파 내용물을 검경한 결과, 기생 종진드기 두부의 palpi 끝에 존재하는 뚜렷한 한쌍의 후크와 genu I에 존재하는 심장모양의 감각기관을 특징으로 하는 *Cheyletiella yasguri*의 중감염이 확인되었다. 자견에서 주로 관찰되는 것으로 보고된 임상증세의 발현이 3년생의 성견에서 관찰된 이유로는 두 달간의 집중적인 항염증제의 투여로 인한 면역억압의 결과라 생각되었다.

(기생충학잡지 34(4): 267-271, 1996년 12월)