

Ectoparasites Infestation Rates in the Pet Rabbits of Daejeon Area, Korea

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(Accepted: June 20, 2013)

Abstract: This study investigated the prevalence of ectoparasite infestations in the pet rabbits of Daejeon area, Korea. The authors used tape strip test, hair coat combing and otoscopy for diagnosis. Only three species were detected. *Cheyletiella parasitovorax* was found in 152/251 rabbits (60.6%), *Psoroptes cuniculi* was found in 7/251 rabbits (2.8%) and *Ornithonyssus bacoti* was found in 5/251 rabbits (1.9%). *C. parasitovorax* is the highest prevalence among the three species. Co-infection of *C. parasitovorax* with *P. cuniculi* was found in 3/251 (1.2%). Co-infection of *C. parasitovorax* with *O. bacoti* was found in 5/251 (1.9%). This study is the first large scale survey of *C. parasitovorax*, *P. cuniculi* and *O. bacoti* in the pet rabbits of Daejeon area, Korea.

Key words: *Cheyletiella parasitovorax*, *Psoroptes cuniculi*, *Ornithonyssus bacoti*, ectoparasite, pet rabbit.

Introduction

Many species of ectoparasites infest pet rabbits. Ticks, fur mites, psoroptic mites, lice and fleas are important ectoparasites of rabbits. *Psoroptes cuniculi* is a non-burrowing mite that causes crusty exudates in the external ear canal and pinna. The life cycle is less than three weeks, and adult mites can survive off the host for between 4 to 21 days (8). *P. cuniculi* can cause severe dermatitis and otitis. The clinical signs include head shaking, ear scratching, and sometimes head tilting (8). *Cheyletiella parasitovorax* causes skin irritations along the back, resulting in scale, pruritis and slight hair loss in infested rabbits (8). Rabbits may not always evince signs of infestation. The entire life cycle takes place on the host and is complete in approximately 35 days. Many rabbits harbor the mite with no signs of disease. However, large numbers of *C. parasitovorax* can cause pruritus, alopecia and scales along the back and particularly above the tail base and on the neck of affected rabbits (5). *Ornithonyssus bacoti* is a blood-sucking ectoparasite and acts as the intermediate host for *Litomosoides carinii*, a filarial nematode of rodents that has been transmitted experimentally by the rat mite, along with murine typhus, rickettsial pox, tularemia, plague and Q fever (5). In general, *O. bacoti* resembles *Dermanyssus gallinae* (chicken mite) and *Ornithonyssus sylviarum* (northern fowl mite). The three species may be differentiated by morphologic findings as follows, the posterior margin of dorsal plate of *D. gallinae* is roughly straight, but it is narrowly

rounded in genus *Ornithonyssus*; the anal opening of *D. gallinae* is located at the posterior end of anal plate, whereas it is located at the anterior half of the anal plate in *Ornithonyssus* species; the anal plate of *D. gallinae* is not oval in shape but it is egg shaped in *O. bacoti*; the dorsal plate setae are more numerous and as long as or slightly longer in *O. bacoti* than *O. sylviarum*; and in the female *O. bacoti*, the dorsal plate lacks the sudden narrowing seen in that of *O. sylviarum* and the third pair of sterna setae is inserted on the shield between the bases of the second pair of legs rather than just behind it as in *O. sylviarum* (6,9).

There are several reports of the prevalence of *C. parasitovorax* (1-4), but the prevalence of other ectoparasites has not been reported to the author's knowledge. The aim of this study was to determine the prevalence of ectoparasite infestations of pet rabbits in the Daejeon area, Korea.

Materials and Methods

Animals and examination of ectoparasites

All rabbits were raised by each owner at home, and they had received no ectoparasitic treatment from April 2010 to August 2011. All rabbits were presented to the local veterinary clinic and Veterinary Teaching Hospital of Chungnam National University for vaccination of viral hemorrhagic disease. Twenty hundred and fifty-one rabbits (130 females and 121 males; age range: 1 month to 12 years; weight range: 230 g-3.6 kg) were examined by tape strip test, hair coat combing and otoscopy.

Results and Discussion

Only three species were detected (Table 1) in the present

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Table 1. Prevalence of ectoparasites in 251 pet rabbits, Korea

Ectoparasite	No. of rabbits examined	No. of positive	Prevalence (%)
<i>Cheyletiella(C.) parasitovorax</i>	251	152	60.6
<i>Psoroptes(P.) cuniculi</i>	251	7	2.8
<i>Ornithonyssus(O.) bacoti</i>	251	5	1.9
<i>C. parasitovorax</i> + <i>P. cuniculi</i>	251	3	1.2
<i>C. parasitovorax</i> + <i>O. bacoti</i>	251	5	1.9
Total	251	164	65.3

study. *C. parasitovorax* was found in 152/251(60.6%) rabbits, *P. cuniculi* was found in 7/251(2.8%) rabbits and *O. bacoti* was found in 5/251(1.9%) rabbits. Co-infection of *C. parasitovorax* with *P. cuniculi* was found in 3/251(1.2%). Co-infection of *C. parasitovorax* with *O. bacoti* was found in 5/251(1.9%).

Flatt and Wiemers (1) reported a survey of fur mites in six commercial rabbit colonies in the United States. *C. parasitovorax* have blade-like chelicerae that are used for piercing their host, and short, strong, opposable palps with curved claws, and the palpal femur possesses a long, serrated dorsal seta (8). Ninety-five out of 220 rabbits in all six colonies (43.2%) were infested with *C. parasitovorax*. Kim *et al.* (2) reported that *C. parasitovorax* was found in 80/140 rabbits (57.1%). The prevalence of *C. parasitovorax* in this study is similar to the report from Kim *et al.* (2), higher prevalence than results of Flatt and Wiemers (1). However, we could not detect *Leporacarus gibbus* in the present study. Three rabbits (1.2%) of 7 rabbits infested with *P. cuniculi* and all rabbits (1.9%) infested with *O. bacoti* were co-infested with *C. parasitovorax*. Four rabbits infested with *P. cuniculi* were exclusive infection. Most rabbits infested with ectoparasites were under 6 months old except for two rabbits (1 year old and 2 years old) infested with *P. cuniculi*. Only two rabbits infested with *O. bacoti* visited the veterinary clinic because the owner detected red mites. Three rabbits were detected

with an infestation of *O. bacoti* on physical examination. Like the report of Son *et al.* (7), five rabbits infested with *O. bacoti* were very young (4-6 weeks old) and visited the veterinary clinic directly after adoption in local pet store. After Son *et al.* (7)'s first report, infestation with *O. bacoti* in pet rabbits increased gradually in Korea. We think that more infestation may have occurred from close proximity to other animals in the pet stores and farms rather than in house.

In conclusion, this study is the first large scale survey of *C. parasitovorax*, *P. cuniculi* and *O. bacoti* in the pet rabbits of Daejeon area, Korea. Intensive skin examination is needed for diagnosis and treatment in pet rabbits because young rabbits less than 6 months old were heavily infested with ectoparasites.

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대전지역 애완토끼의 외부기생충 감염

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요 약 : 본 연구는 대전지역 애완토끼의 외부기생충 감염율을 대규모로 조사하였다. 총 3종류가 검출되었는데 *Cheyletiella parasitovorax*는 152/251(60.6%), *Psoroptes cuniculi*는 7/251(2.8%) *Ornithonyssus bacoti*는 5/251(1.9%)로 각각 검출되었다. 또한 *C. parasitovorax*와 *P. cuniculi*의 혼합감염은 3/251(1.2%)이었고, *C. parasitovorax*와 *O. bacoti*의 혼합감염은 5/251(1.9%)를 나타내었다. 따라서 외부진드기에 감염된 토끼들을 대상으로 적극적인 구제대책이 필요하다고 판단된다.

주요어 : *Cheyletiella parasitovorax*, *Psoroptes cuniculi*, *Ornithonyssus bacoti*, 외부기생충, 애완토끼