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Ear mite infestation in a lop-eared rabbit (*Oryctolagus cuniculus*) and successful treatment with ivermectin

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(Received 8 February 2015; revised 23 April 2015; accepted 28 April 2015)

Abstract

A 2-year-old female lop-eared rabbit (*Oryctolagus cuniculus*) was presented to the veterinary clinic at a zoo with pruritus, alopecia, and crusting of the ear. Examination of skin scrapes revealed an infestation with the rabbit ear mite, *Psoroptes cuniculi*. Weekly subcutaneous ivermectin injection over a three-week period resulted in remission of the clinical signs and improvement of the overall conditions of the rabbit.

Key words : Acaricide, Ivermectin, Lop-eared rabbit, *Oryctolagus cuniculus*, *Psoroptes cuniculi*

INTRODUCTION

Mange caused by mite infestation is considered an important skin disease in rabbits (Gupta et al, 2014). The rabbit ear mite *Psoroptes (P.) cuniculi* is a common globally found ectoparasite of the rabbit. *P. cuniculi* causes mange, mainly in the ears, rarely in perineal regions (Ulutas et al, 2005; Bulliot et al, 2013). The non-burrowing mite *P. cuniculi* is primarily found inside the pinnae, where it creates crusting lesions. It is thought to feed on serous exudate, skin secretions, and blood (Gupta et al, 2014). The main clinical signs of psoroptic mange are pruritus, erythema, crusting of the external ear canal, and pain on palpation (Gupta et al, 2014). Ear mange in rabbits is an important animal health concern and hygiene issue. In addition, infestation with the ear mite can cause considerable economic losses because of weight loss, loss of balance, and meningitis, which is frequently fatal when complicated by secondary infections.

Diagnosis of psoroptic mange is made by identification

of the mites or the eggs in superficial skin scrapes. Oral or injectable ivermectin has been reported to be effective in the treatment of acariasis (Eraslan et al, 2010). The present study describes the successful therapeutic management of psoroptic mange in a lop-eared rabbit, by subcutaneous injections of ivermectin.

CASE REPORT

A 2-year-old female lop-eared rabbit (*Oryctolagus cuniculus*) was presented to the veterinary clinic at a zoo with a history of anorexia, pruritus, and alopecia. The pruritus presented as shaking of the head and continuous scratching of the ear. On physical examination, the rabbit was dull and depressed, and had a poor physical condition. Examination of the ear revealed crusting of the external ear canal and of the internal surface of the pinna (Fig. 1).

To identify the causative agent, skin scrapings were performed. Microscopic examination revealed the presence of *P. cuniculi* mites and eggs (Fig. 2). There was an abundance of mites and the mites were highly

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Fig. 1. Clinical signs of the lop-eared rabbit. Note the poor body condition and the dull and depressed appearance (A), the crusts on the external ear canal (B, C), and the crusts on the internal surface of the pinna (D).

mobile. No other causative agents were recognized. The mites were 500~700 μm in length, oval in shape, and all four legs projected beyond the body margin (Fig. 2A). The characteristic pointed mouthparts and three-jointed long pedicels with funnel-shaped pulvilli (Fig. 2B) differentiate *P. cuniculi* from *Chorioptes* spp. In addition, the males had rounded tubercles in the posterior abdomen (Fig. 2C). The eggs that were detected were approximately 200~250 μm in length and oval in shape (Fig. 2D) and their morphology was in consistent with the previous description on those of *P. cuniculi* (Taylor et al, 2007).

To treat the psoroptic otocariasis, the rabbit received four weekly injections with ivermectin (0.4 mg/kg, SC; Advantage DUO, Bayer, Germany) as well as prednisolone (2.0 mL, IM; Samu Prednisolone inj., Samu, Korea) to reduce inflammation. The skin lesions disappeared within three weeks, and follow-up skin scrapes were negative for *P. cuniculi*.

DISCUSSION

Rabbits have been traditionally bred for meat and fur, but they are now kept as companion pets worldwide (Rosen, 2011). In Korea, there has been a rising trend of raising rabbits as pets. The lop-eared rabbit, also known as the long-eared rabbit, is a small land mammal, with white fur and gray patches around the eyes. There are various rabbit breeds and there is a wide variety in appearance of the fur. The name “long-eared” comes from the ears that exceed the length of the body. The ears of the lop-eared rabbit are long and pendulous, and therefore provide a good environment for ectoparasites.

Multiple species of ectoparasites, including mites, ticks, lice, and fleas, affect rabbits. Mites are one of the most significant pathogens that infest the ears of the lop-eared rabbit. Various species of mites (*P. cuniculi*, *Cheyletiella parasitivorax*, *Sarcoptes* (*S.*) *scabiei*, and *Chorioptes bovis*) can affect rabbits and differential diagnosis is required to reach a final diagnosis. The mites can be identified based on the following morphological criteria (Taylor et al, 2007; Eo et al, 2008): *P. cuniculi* mites have legs that project beyond the body margin,

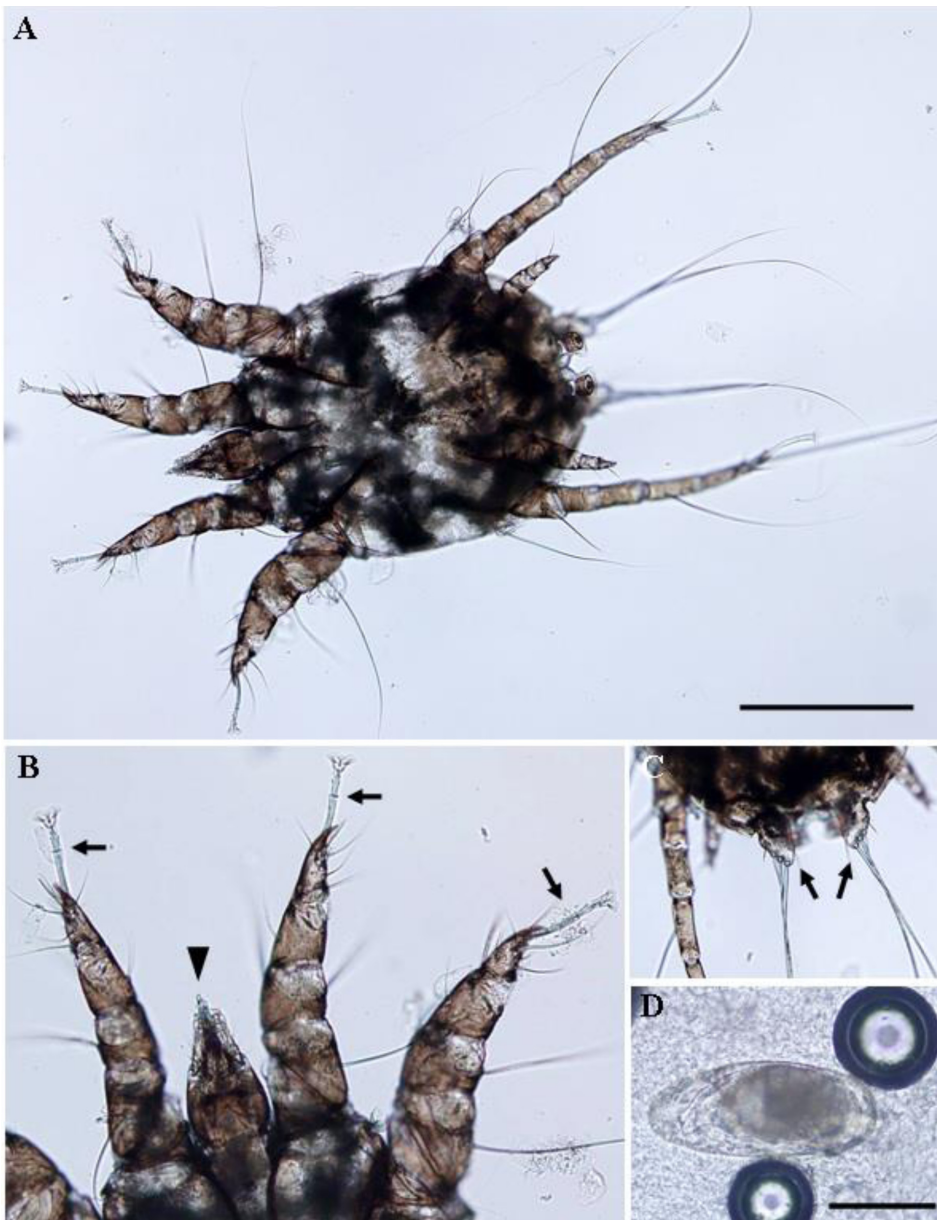


Fig. 2. *Psoroptes cuniculi* identified by microscopy. (A) *P. cuniculi* mite, 500~700 µm in length and oval in shape. All four legs project beyond the body margin. Bar=300 µm. (B) Magnification of A, the arrow-head indicates characteristic pointed mouthparts and the arrows indicate the three-jointed long pedicels with funnel-shaped pulvilli. (C) Magnification of A, the arrows indicate a male mite with rounded tubercles on the posterior abdomen. (D) *P. cuniculi* egg, approximately 200~250 µm in length and oval in shape. Bar=100 µm.

they have three-jointed long pedicels, and male mites have rounded tubercles on the posterior abdomen. *Cheyletiella parasitivorax* can be recognized by the distinctive blade-like chelicerae used to pierce the host. The burrowing mite *S. scabiei* has characteristic sucker-like pulvilli, borne on long unjointed pedicels, triangular scales, transverse ridges on the dorsum, and three epimeres that are chitinous extensions of the coxae of the legs. *Chorioptes bovis* has cup-shaped pulvilli, borne on short unjointed pedicels, rounded mouthparts, and male mites have truncate tubercles on the posterior abdomen. Based on these morphological criteria, the

mange in the lop-eared rabbit in the current study was diagnosed as caused by *P. cuniculi*. No other mites were detected by microscopy.

Previously, two studies on mite infestation in rabbits have been reported in Korea (Kim et al, 2008; Eo and Kwon, 2010). Eo and Kwon (2010) reported a case of psoroptic otocariasis in two male domestic rabbits. In that study, treatment with ivermectin and a streptomycin-penicillin combination allowed one animal to completely recover, but the other rabbit died with meningitis-like clinical signs. Differences between the cases were not described; however, the immunological status

between these two could have influenced the different outcome. Kim et al. (2008) reported a *Cheyletiella parasitovorax* infestation prevalence of 57.1% (80/140) in pet rabbits in Korea. In these two studies, however, the breed of the affected rabbits was not described. In the present study, a lop-eared rabbit was infested by *P. cuniculi* and there were no other ectoparasites detected. The variation in mite infestation between our study and the previous studies could be caused by differences of target population between privately owned rabbits reared indoor and captive rabbits reared outdoor.

In conclusion, this study reports the outbreak of *P. cuniculi* infection in lop-eared rabbit and its successful treatment with ivermectin. Because ivermectin has been reported as an effective treatment for *P. cuniculi* in rabbits (Acar et al, 2007; Eo and Kwon, 2010; Bulliot et al, 2013; Gupta et al, 2014), ivermectin should be considered the first choice for treatment of rabbits infected by *P. cuniculi*.

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