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Infestation of a New Colony of New Zealand White Rabbits housed in a New Animal Facility by Ear Manage Mite, *Psoroptes Cuniculi*

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Abstract

Psoroptes cuniculi is a common ectoparasite that causes ear mite infection in several species including rabbits. Six New Zealand White rabbits were purchased from a local breeder and were quarantined in a newly established Laboratory Animal Care Unit (LACU), Faculty of Medicine, Sungai Buloh, Selangor, Malaysia. Clinical examination for endo and ectoparasites were found to be negative. A prophylactic dose of ivermectin (0.1ml/kg, s.c) was administered. Rabbits were transferred to a holding area after 30 days of quarantine. Routine husbandry practices were followed under the guidance of a trained research assistant (RA). Approximately after 2-3 weeks, hard and scaly skin lesions were observed in the fore paws and hairy portion of the nails in three rabbits. In addition, both ears were observed to exhibit severe otitis externa with heavy crusting. The present study attempts to investigate the mode of transmission and the preventive measures to be adopted. Ear and fore paw scrapping were mixed with liquid paraffin and subjected to light microscopic (10 & 40X) observation. Psoroptic mites were observed and identified as *Psoroptes cuniculi.* Six rabbits were treated initially with ivermectin (0.2 ml/kg, s.c) and 0.4ml was instilled into both the ears. The treatment was repeated similarly after two weeks. It was identified that the transmission of *P.cuniculi* was through the RA. The RA has been visiting the rabbit breeder to learn the basic techniques of handling rabbits. The same lab coat was used by the RA at rabbit breeder facility and LACU. Transmission of *P.cuniculi* may be from the breeder through RA clothing. Veterinarians or animal care takers should follow the standard operating procedures for laboratory animal husbandry. Disposable personal protective equipment's should be practiced during routine husbandry practices.

Key words: Rabbits, Ectoparasites, Psoroptic mites, *Psoroptes cuniculi,* Ivermectin, Psoroptic scabies, Psoroptic mange

Introduction

New Zealand white rabbit (*Oryctolagus cuniculus*) is being used routinely in biomedical research. Very often, these rabbits are purchased from private breeding farms and brought to the laboratory for biomedical research. Only limited research centers in Malaysia breed the New Zealand white rabbits for research use. Parasites remain a problem because few preventive health programs are instituted at breeding population level. Ectoparasites are common in captive rabbits. *Psoroptes cuniculi* is the common rabbit ear mite both in the breeding farms and in laboratory conditions. Rabbits have a very thin and delicate skin that is covered with fine fur comprised of both a soft undercoat and stiff guard hairs (Mitchell and Tully, 2009). Rabbits lack footpads, instead their feet are covered with thick, coarse fur that protects the plantar and palmar surfaces of the feet. They have non retractable claws, making declawing an inappropriate procedure.

Materials and Methods

Six New Zealand white rabbits were purchased from a local breeder and were quarantined in a newly established Laboratory Animal Care Unit (LACU), Faculty of Medicine, Sungai Buloh, Selangor, Malaysia. Clinical examination for both endo and ectoparasites were found to be negative. A prophylactic dose of ivermectin (Kelamectin 1% ®), Kela N.V., St. Lenaartseweg, Belgium) (0.1 ml/kg, s.c) was administered. Rabbits were transferred to a holding area after 30 days of quarantine period. Routine husbandry practices were taken care by the research assistant (RA). After three weeks, hard and scaly skin lesion was observed in the fore paws and hairy portion of the nails respectively in three rabbits. In addition, severe otitis externa with heavy crusting in both ears were observed.

Home cage and handheld clinical observations were made for each rabbit. Later, the rabbits were restrained appropriately. The scraping samples were collected from both ears and fore paws. The scraps were mixed with a drop of liquid paraffin and examined under the light microscope (10 and 40X). Treatment with ivermectin, 0.2 ml/kg subcutaneous and 0.4 ml instilled into both the ears of affected rabbits were done for two weeks to suppress ear mange.

Results and Discussion

The rabbit ear mite infestation lead to head shaking, scratching of the ears with hyperemia. Ear lesions produce signs of erythema with crusting in the external ear canal (Paterson, 2008). The crust can be very thick and are composed of mites, mite feces, desquamated epithelial cells, serum and inflammatory cells. In advanced cases, forms thick crust and block the auditory canal. This can spread to the face, neck and limbs. In severe cases, it may lead to secondary bacterial infection and meningitis. *Psoroptis cuniculi* is responsible for infestation and it belongs to the family, *Psoroptidae*. These mites cause sheep scab, cattle scab, horse scab, goat scab, rabbit scab and in some wild animals. Psoroptic mites differ from Sacroptic mites. Psoroptic mites possess a sucker on a long jointed stalk on pairs 1, 2 and 4 in the female and in the male sucker on a long jointed stalk on pairs 1, 2 and 3. While sacroptic mites, display suckers on the long unjointed stalk in pairs 1 and 2, while in the male the sucker on a long unjointed stalk on pairs 1, 2 and 4 (Sloss *et al.*, 1994; Zajac *et al.*, 2006). Ivermectin is an effective treatment for both localized and general infestation (Curtis *et al.*, 1990, Curtis and Brooks, 1990). Scrapings from the infested rabbits showed *P. cuniculi* (Fig.1). After two weeks of treatment with ivermectin, the mites cleared completely. The infestation cleared without the need for cleaning the ears. Psoroptic mites do not burrow unlike the sacroptic mites. All the stages are found on the skin surface (Zajac *et al.*, 2006). The life cycle is less than three weeks, and adult mites can live on the host up to 21 days depending on ambient temperature and humidity (Paterson, 2008). It feeds on loose epidermal debris, especially lipid materials. The antigenic material in the mites' saliva and feces can invoke an intense inflammatory reaction in the host. It is recommended not to clean the crusts, as the ears are very painful and tends to bleed (Quesenberry and Carpenter, 2011). It is recommended to use prednisone (0.5 mg/kg, p.o., b.i.d × 5 days) or Meloxicam (0.2 mg/kg, p.o., b.i.d × 5 days) to reduce otitis and pain (Mitchell and Tully, 2009). It is recommended to use ivermectin (0.4 mg/kg, s.c, and half dose in each ear) or selamectin (*Revolution* ®, Pfizer Animal Health, New York), 6 or 18 mg/kg topically 1 – 2 times) (McTier *et al.*, 2003). Affected rabbits develop severe otitis external. The external canal and pinnae have a significant quantity of crusty exudates. The crusty exudate is the result of the hypersensitivity reaction to the mite and can cause a significant discharge and pruritus. The transmission of *P. cuniculi* in this case may be, from the breeder through RA clothing. Veterinarians or animal care takers should follow the standard operating procedures for laboratory animal management and husbandry. Disposal personal protective equipment (surgeon's cap, face mask, coat, glove and shoe covers) should be practiced during routine husbandry practices.

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Fig. 1: Microscopic examination of the scraping shows the *Psoroptes cuniculi*.