

## Pathomorphological study of Notoedric Mange in rabbit

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### ABSTRACT

In order to identify the cause of death, a carcass of an 8-month-old *Soviet chinchilla* was presented to Department of Veterinary Pathology, GADVASU, Ludhiana with the history of emaciation and dermatitis. A detailed investigation of the carcass revealed crusty lesions in ears and alopecic patches around eyes and lips. The parasitological investigation of skin scrapings revealed the presence of *Notoedres cati*, which very rarely infests rabbits. Histopathology revealed multiple mite burrows in skin along with hyperkeratosis and lymphoeosinophilic infiltration. Based on the gross lesions, morphology and histopathology, a very rare case of Notoedric mange in soviet chinchilla is documented.

**Keywords:** Mites, notoedric mange, skin, *soviet chinchilla*

*Oryctolagus cuniculus* are the domesticated rabbit and can be reared in varying conditions and acts as a source good quality protein, fiber, animal model for various research and company<sup>1,2</sup>. Mange in rabbits is an emerging and highly transmissible disease brought about by numerous burrowing and non-burrowing mite species and creates a significant threat to the sustainability of rabbit husbandry practices<sup>3</sup>. The borrowing mite *Notoedres cati* is a cause a of highly infectious skin infestation referred as notoedric mange, also Feline scabies and head mange, is one of least reported cause of acariotic mange in rabbits<sup>4</sup>. *N. cati* is classified under the family Sarcoptidae which also includes other borrowing mites *viz.* *Sarcoptes* and *Trixacarus*. The adult female borrows into epidermis and cause varying degree of dermatitis along with erythema, pruritis, hair loss, scaling and dermal encrustation characteristic of mange, persistent infestation can lead severe cachexia<sup>5,6</sup> as well as vestibular disease and meningitis<sup>7</sup> and also predisposes their skin to other complications like secondary bacterial infections<sup>8</sup>. The mites typically feed off stratum granulosum and serum of the host<sup>9</sup>.

An 8-month-old male *Soviet chinchilla* was presented for necropsy examination at the Department of Veterinary Pathology, GADVASU, Ludhiana with a history of long-standing dermatitis and subsequent debilitation. A thorough necropsy examination was conducted at the departmental necropsy hall. All the gross lesions were recorded and photographed. Representative tissues were taken in 10% neutral buffered formalin. Collected tissues were processed and stained using hematoxylin and eosin (H&E)<sup>10</sup>. Furthermore, ear scrapping was taken in 10% KOH solution and heated at 75°C and observed under microscope<sup>11</sup>.

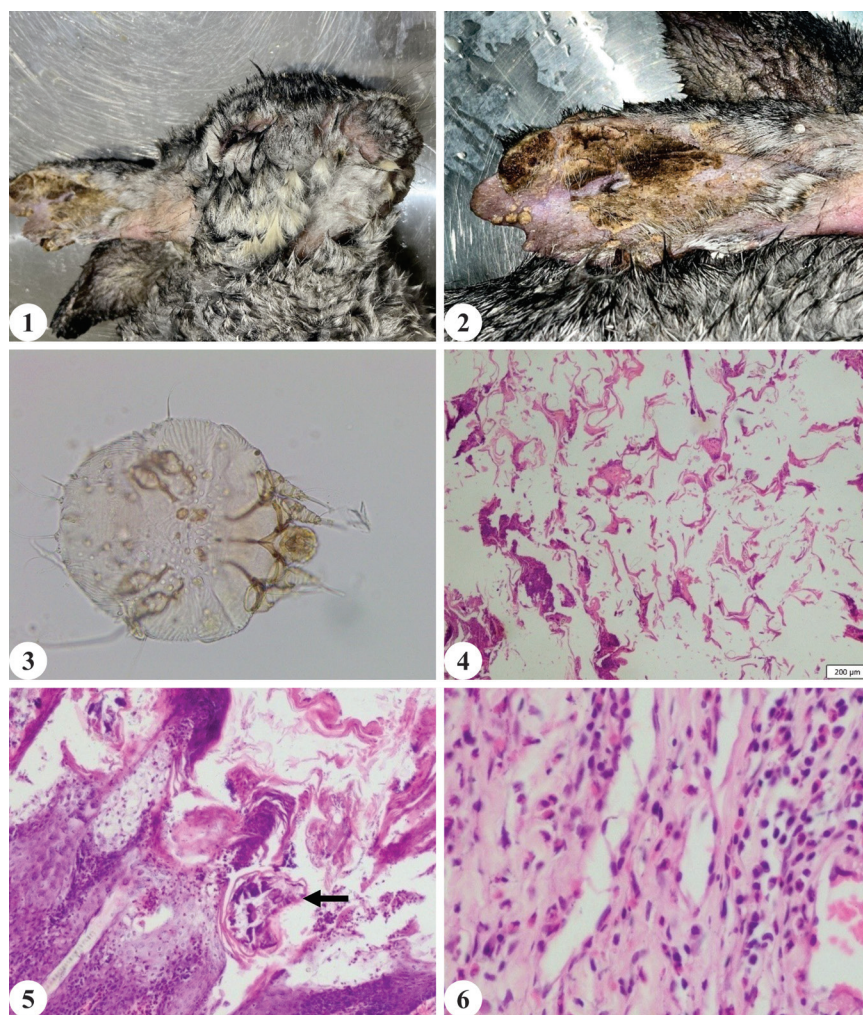
On gross examination, the dehydrated rabbit carcass exhibited emaciation partially dried and crusted scab over both ears and areas of alopecia and eczema of skin around eyes and lips (Figs. 1 and 2). Adult *Notoedres cati* parasites were characterized by circular rings on the dorsal surface, lack of scales and prominent dorsal anus in rabbit skin scrapings (Fig. 3).

On histological examination, lesions on skin were characterized by hyperkeratosis with both para and orthokeratosis along with rete pegs invading into underlying dermis (Fig. 4). Cross sections of mites were also seen in burrows

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in the epidermis mainly in stratum corneum (Fig. 5) and also in overlying scab. Some keratin cysts were also observed. Under affected epidermis there was infiltration of mainly lymphocytes as well as eosinophils (Fig. 6). Epidermal micro abscesses were also observed.

*N. cati* infestation have been rarely described in rabbits. Transmission is generally through intimate contact within a host species<sup>12</sup> and also from one animal to another via direct contact or via interaction with the environment<sup>13,14</sup>. One epidemiological study conducted in Egypt revealed only a 2.5% prevalence of Notoedric mange in lagomorphs<sup>15</sup>. Concurrent infestation of *Notoedres* with Sarcoptic and/or Psoropti cariosis in rabbits have also been described in various studies<sup>4,14,16</sup>. Clinically *N. cati* infestations in rabbits can cause scales, scabs,



**Fig. 1.** Eczema and alopecia on skin around eyes and lips; **Fig. 2.** Thick crusted scab over ear; **Fig. 3.** Photomicrograph of the notoedric mite (400x); **Fig. 4.** Skin: Low power image revealing massive hyperkeratosis with numerous mites (H&E 40x); **Fig. 5.** A section of skin exposes mites (arrow) in burrows in the epidermis, as well as rete papillae development in the epithelium along with serocellular and eosinophilic crust (H&E 100x); **Fig. 6.** Mononuclear inflammatory cells infiltration along with heterophils in the underlying dermis (H&E 400x).

and irritation on the pinnae, ear canal, lips, nose and face as well as other body areas such as the neck, legs and genitalia<sup>13</sup>. *Notoedres* sp. create pathogenic effects by tunneling behavior and physical damage produced by the mites during excavations, irritating action of their secretions and excretions, allergic responses to certain of their extracellular products and mainly the production of interleukin-1<sup>17,18</sup>. The pathological finding in current study were in concordance with earlier literature which described similar lesions<sup>4,19</sup>. The primary way to identify *N. cati* is by deep skin scrapings. The most widely used acaricides are organophosphorus chemicals (diazinon), synthesized pyrethroids and macrolactones. Ivermectin, either orally or parenterally is proven to be an efficient acaricide for disease treatment<sup>14,20</sup>.

The gross, histopathology and parasitological findings in current case confirmed notoedric mange infestation in

rabbit. This report highlights the pathological alterations during the *N. cati* infestation in rabbits which is seldomly reported. Although treatment with several acaricides have been proven effective none the less preventing it is crucial, since it is highly contagious may cause significant economic losses for rabbit herds.

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