

# Case Report : Cnemidocoptiasis (Scaly Leg) of Paddyfield Pipit Bird (*Anthus rufulus*) in Petchaburi Province of Thailand

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## Abstract

An adult paddyfield pipit bird (*Anthus rufulus*) was trapped from amphoe Banlaem, Petchaburi province on March, 2005. The bird had advance scaly leg mange lesions on both swollen tarsuses. Gross lesion consisted of marked elevated epidermal scales of shanks , keratinization, marked and thick crust formation on both dorsal and ventral sides of entire shanks of infested bird but malformation of the feet did not occur. The causative mites were identified as *Cnemidocoptes* spp. (Astigmata : Sarcoptidae) which were resembled as *C. mutans*

**Key words :** scaly leg, *Cnemidocoptes*, paddyfield pipit bird, Petchaburi province, Thailand

## บทคัดย่อ

นกเด้าดินทุ่งหญ้าโตเต็มวัยตัวหนึ่ง (*Anthus rufulus*) ถูกดักจับโดยใช้ตาข่ายจากอำเภอบ้านแหลม จังหวัดเพชรบุรีในเดือนมีนาคม 2548 นกดังกล่าวพบว่าเป็นแฉ่งขี้เรื้อนอย่างมากที่บริเวณแข้งของขาซึ่งมีขนาดใหญ่ทั้ง 2 ข้าง วิจารณ์ที่สังเกตเห็นได้ด้วยตาเปล่าพบว่าเกล็ดที่บริเวณแข้งจะถูกยกให้สูงขึ้น เกิด keratinization อย่างชัดเจน บนด้านบนและด้านล่างตลอดความยาวของแข้งนกจะพบสะเก็ดที่เป็นแผ่นใหญ่และหยาบจำนวนมากเกาะกันเป็นชั้นที่หนาปกคลุมเกล็ดของแข้งนก แต่ไม่พบการบิดเบี้ยวของนิ้วเท้านก จากการตรวจแยกชนิดไรซึ่งเป็นสาเหตุที่ทำให้เกิดแฉ่งขี้เรื้อน พบว่าเป็นไรขี้เรื้อนในสกุล *Cnemidocoptes* (Astigmata : Sarcoptidae) ซึ่งมีลักษณะคล้ายกับ *C. mutans*

**คำสำคัญ :** แฉ่งขี้เรื้อน ไรขี้เรื้อน *Cnemidocoptes* นกเด้าดินทุ่งหญ้า จังหวัดเพชรบุรี ประเทศไทย

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## Introductuion

Scaly leg mange is important skin disease of old birds and fowls in many parts of the world especially of tropical countries. Cnemidocoptiasis causes uneconomic importance in chicken because it usually occurs in old fowls and the lesion develops slowly which does not cause lameness in mangy hosts. The causative mange mites (*Cnemidocoptes* spp.) burrow into skin of feet and shanks of infested birds and inhabit underneath epidermal scales.

Scaly leg mange of native fowls have ever been reported in Bogor, Indonesia (Sangvaranond, 1975) and also in Petchaboon province, Thailand (Sangvaranond, 1976). The mange mites in both studies were identified as *Cnemidocoptes mutans* (or *Knemidocoptes mutans*). The other species of *Cnemidocoptes* (*C. pilae*) was also found in budgerigars in Thailand (Sangvaranond, private communication).

*Cnemidocoptes* are mange mites of avian hosts and are members of order Acarina, suborder Astigmata (Sarcoptiformes) and family Sarcoptidae (Soulsby, 1982). Adult female *Cnemidocoptes* has short and stumpy legs . All legs do not have any tarsal suckers. The morphological difference between female *Sarcoptes* and female *Cnemidocoptes* is the absence of dorsal spines in *Cnemidocoptes*. There are three important species of *Cnemidocoptes* that infest birds and fowls. Dorsal surface of idiosoma of female *Cnemidocoptes mutans* is covered by scales but these scales are absent in female *C. gallinae* (*Mesoknemidokoptes*)

(Baker ,1999 ; Soulsby, 1982).

*C. mutans* had ever been reported to cause scaly legs in a great horned owl (*Bubo virginianus*) (Schulz *et al.*, 1989). Mainka *et al.*(1994) reported infestation of *Knemidocoptes* sp. on wild passerine birds from Mai Po Nature Reserve in Hong Kong. The infested birds had lesions on beaks, legs and feet which were covered by crusts. *C. jamaicensis* infested migratory American robins (*Turdus migratorius*) and caused scaly leg mange in Oklahoma, USA. (Pence *et al.*, 1999)

The purpose of this study was reporting of scaly leg case in a bird in Thailand and generic identification of the causative mites.

## Materials and Methods

### The mangy bird

The trapped bird was identified as paddyfield pipit (*Anthus rufulus*) by Dr. Kaset Sutasha. The bird was caught by net trapping by Round, P.D. and Sutasha, K. on March, 2005 from amphoe Banlaem, Petchaburi province, Thailand. The bird was very small and in adult stage with sexual unidentification. This paddyfield pipit had long and thin tarsus. Gross examination of affected legs was done and the mites were collected from underneath epidermal scales on tarsus for further identification. The mangy scrape was sent to Department of Parasitology, Faculty of Veterinary Medicine, Kasetsart University for parasitological diagnosis.

### Preparation of mite specimens for identification

The scrape was collected and preserved in 70% ethanol. The mites were isolated from scrape, cleaned and mounted directly with Hoyer's medium (Hoyer's medium method) (Krantz, 1970). After mounting, the specimens were incubated and the rounded coverglasses were sealed by nail enamel.

#### Identification of mites

Generic identification of mites were based on their taxonomic characters as mentioned by Harwood and James (1979) and Soulsby (1982). The mite identification was done at Department of Parasitology, Faculty of Veterinary Medicine, Kasetsart University, Bangkok campus.

In this study, tentative diagnosis of scaly leg infestation was based on character of lesion, affected host organs and species of hosts. However, the actual diagnosis was confirmed by laboratory identification of the causative mites under compound microscope.



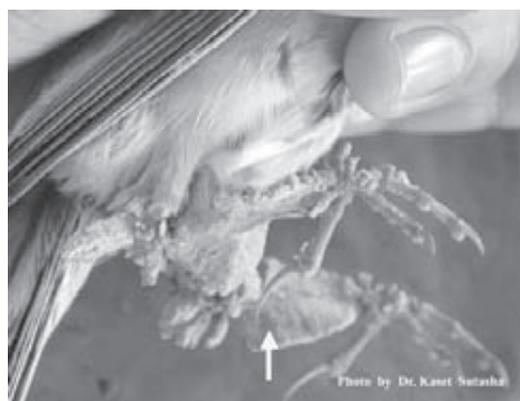
**Figure 1** Scaly leg mange caused by *Cnemidocoptes* spp. in paddyfield pipit bird

## Results

The paddyfield pipit bird (*Anthus rufulus*) was found to be infested heavily by *Cnemidocoptes* mites. Mites burrowed underneath epidermal scales of tarsus and inhabited in thick layer of crust formation on shank. Mites caused chronic irritation and inflammation. Epidermal scales of shanks were marked protruded and covered by crusts with serum oozing. Thick layers of crusts were formed around the affected tarsus of birds (Figure 1 and 2). Crusts were large and rough which covered entire length of shank. However, the many bird could move without any lameness

#### Identification of mites

Various stages (larva, adult males and adult females) of the mites were examined from the scrape. The mites belonged to order Acarina, suborder Astigmata (Sarcoptiformes) and family Sarcoptidae (or family Knemidokoptidae). The examined mite was *Cnemidocoptes* spp.



**Figure 2** Gross lesions of scaly leg mange (arrows) in paddyfield pipit bird

### Morphology of the mites

Descriptions of the mites from this study were as followings :

#### Adult female mites

Adult female was 360 microns in length and 330 microns in width (measured from 1 specimen). Body had globular shape. Dorsal surface of idiosoma was covered by large scales (2/3 part of idiosoma) and transverse striae (anterior third of idiosoma). Two longitudinal chitinized bars and one transverse chitinized bar were distinct and located on dorsal surface of propodosoma of mites. Dorsal surface of idiosoma did not cover with spine and triangular shaped scales were not found as in genus *Sarcoptes*

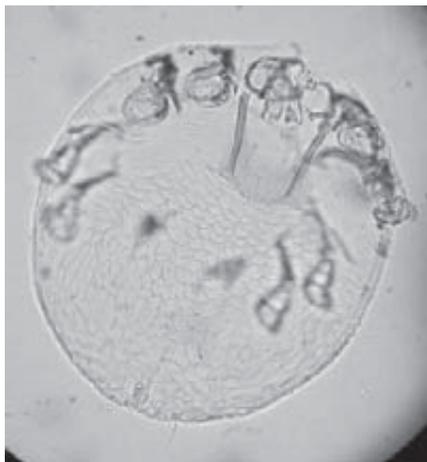
Ventral surface of idiosoma was covered almost entirely by transverse striae. Epimeres (apodemes) of all legs were distinct but epimeres of first pair of legs were not fused to form one

medial longitudinal rod of idiosoma. Anus situated terminally at posterior end of idiosoma. Adult female mite had four pairs of short and stumpy legs without sucker.

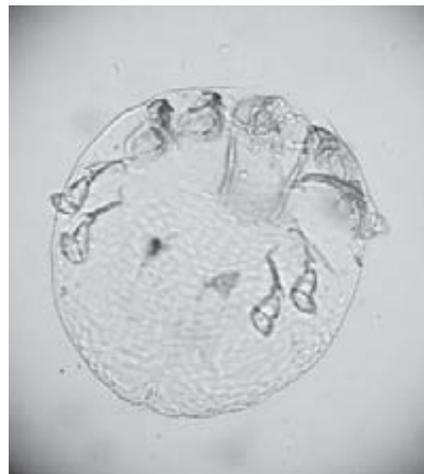
#### Adult male mites

Adult males were 200 – 220 microns (average 215 microns) in length and 150 – 170 microns (average 162.50 microns) in width (measured from 4 specimens). Male mites were smaller than female mites. Distinct longitudinal and transverse chitinized bars and transverse striae were found on dorsal surface of idiosoma but dorsal scales were not distinct as in female mites (Figure 5)

Ventral surface of idiosoma consisted of distinct epimeres of legs, male external genitalia which lied between the fourth pair of coxae and terminal anus. Epimeres of first pair of legs were united in the middle line of idiosoma forming Y-shape.



**Figure 3** Dorsal surface of idiosoma of *Cnemidocoptes* spp. from paddyfield pipit bird ( X 400 )



**Figure 4** Ventral surface of idiosoma of *Cnemidocoptes* spp. from paddyfield pipit bird ( X 400 )

All legs of the male mites had long unjointed pedicels with suckers. Their legs were longer than those of female mites. (Figure 5)

#### Mite larva

Larva were 160 – 210 microns (average 182 microns) in length and 120 – 160 microns (average 132 microns) in width (measured from 5 specimens). Larva had three pairs of legs with distinct epimeres. Chitinized bars and transverse striae were found on dorsum of idiosoma. Dorsal scale was not found on idiosoma of larvae. All legs of larva had long unjointed pedicels with suckers. (Figure 6)

### Discussion

There are three important species of *Cnemidocoptes* which cause scaly leg in avian hosts throughout the world (Harwood and James, 1979;

Soulsby, 1982). *C. mutans* are known to be causative agent of scaly leg mange among old fowl while *C. pilae* and *C. jamaicensis* cause mange in many kinds of birds. In this study, the examined mites had morphological difference from *C. mutans* and from consideration of mite's hosts, it may be concluded that the mites were not *C. mutans*. *C. pilae* causes many lesion on face, beak and legs of budgerigars and parakeets but not in paddyfield pipit bird. The mites did not also cause mange on face and base of beak which were differ from affected areas of *C. pilae*. However, actual identification of the mite from this study must be based on its taxonomic characters. *C. jamaicensis* causes scaly leg of some birds but not in budgerigars and parakeets (Soulsby,1982). In this study, the mites could not identify as *C. jamaicensis* due to lacking of the suitable key for mite identification, however the generic identification



**Figure 5** Ventral surface of idiosoma of adult male *Cnemidocoptes* spp. from paddyfield pipit bird ( X 400 )



**Figure 6** Larva of *Cnemidocoptes* spp. from paddyfield pipit bird ( X 400 )

of the mite could be done. The mites were identified as genus *Cnemidocoptes* by following taxonomic characters : (1) globular shaped idiosoma, (2) dorsal surface without any spine, (3) presence of two longitudinal chitinized bars and one transverse chitinized bar and (4) leg characteristics of male and female mites. The birds may be infested by mites from the contact ground while they feed. After collection of mites, the bird was released without any mange treatment.

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