

Short Report

A mesostigmatic mite, *Dermanyssus* species collected from a Pallas's squirrel, *Callosciurus erythraeus*

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Abstract: Four adult female specimens of a mesostigmatic mite were collected from the body surface of a Pallas's squirrel, *Callosciurus erythraeus*, a species invasive to Japan, captured in Kanagawa Prefecture, Japan in April 2019. Based on their morphology, the mites were identified as belonging to the genus *Dermanyssus*, probably being the poultry red mite *D. gallinae*. Twenty six other squirrels captured almost at the same time in the same area were also examined. Not one was infested by ectoparasites. Infestation in the present case would not be prevalent. However, the possibility exists that the Pallas's squirrels propagate the poultry red mites among chicken ranches.

I. Introduction

The Pallas's squirrel, *Callosciurus erythraeus*, a species of the family Sciuridae, was originally distributed in Southeast Asia from Assam, Arunachal Pradesh, Manipur, and Meghalaya in northeastern India to Myanmar, the Malay Peninsula, Thailand, eastern Cambodia, Laos, and Vietnam, in addition to southeastern China, Hainan Island, and Taiwan. This species of squirrel has invaded some countries of the world as an alien invasive species (Lurz et al. 2013). In Japan, a subspecies of this squirrel, *C. e. flavimanus* (synonym: *C. e. taiwanensis* which is a formerly used subspecies name in Japan), which is not native to Japan, has been populated in some areas such as Kanagawa and Shizuoka Prefectures (Tamura 2004, Suzuki & Torii 2016). Pallas's squirrels cause such problems as peeling of bark, trespassing into houses, and mastication of electric wires as well as adversely influencing native biogeocenosis (Tamura & Miyamoto 2005). Therefore, some municipalities are striving to capture all individuals of this alien squirrel species.

We detected mites unexpectedly from the body surface of one Pallas's squirrel specimen. As presented herein, we describe and discuss infestation of the squirrels by mites.

II. Case presentation

The Pallas's squirrel on which mites were detected was one squirrel that had been captured as part of a capture policy against harmful mammals in Zushi-shi, a municipality located in a southern

area of Kanagawa Prefecture, in April 2019. This squirrel was an adult female with 20 cm head and body length, 18 cm tail length, and 315 g body weight. Four mites were collected from the squirrel body surface.

After the collected mites were fixed and preserved in 70% (V/V) ethanol aqueous solution, they were dehydrated and then permeated with xylene to be observed morphologically under a light microscope (Fig. 1). The external morphology of the mites indicated 0.8–1.0 mm idiosoma length, 0.5–0.7 mm idiosoma width, rounded posterior part of the idiosoma, and elongated and stylet-like chelicerae. One pair of stigmata was observed around the coxae of legs II and III. Setae on the idiosoma formed rows. The dorsal plate on the dorsal side was an elongated pentagon, the forward edge of which was angular. Its rear edge was narrow and almost linear. On the

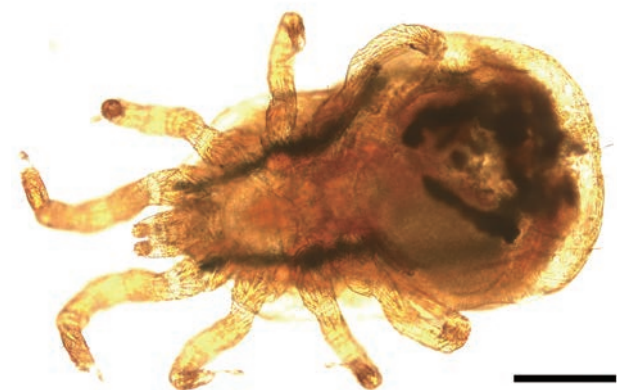


Fig. 1. *Dermanyssus* species (female, adult) collected from a Pallas's squirrel, *Callosciurus erythraeus*. Scale bar = 200 μ m.

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ventral side, the sternal plate was broad and bearing two pairs of sternal setae. The genitoventral plate was ligulate. The anal plate was broad and nearly triangular with forward and rear edges that were, respectively, linear and semicircular. The anus opened at the posterior part of anal shield. One of the four detected mites was observed to have sucked blood. From these morphological findings, the mites were identified as belonging to the genus *Dermanyssus*. They are particularly regarded as having morphological features corresponding to those of the poultry red mite *D. gallinae*.

The other 26 Pallas's squirrels, which were captured in the same area at around the same time as the individual described above, were also examined for ectoparasites. Nevertheless, they were not found to be infested by any ectoparasite.

III. Discussion

Poultry red mites are nocturnal: they parasitize their hosts to suck blood during darkness; they lurk in cracks and crevices behind something during other times (Knežević et al. 2017, Gay et al. 2020). It might not be reasonable that the mites were detected from the diurnal Pallas's squirrel. This is because the squirrel probably had few opportunities to be infested by the nocturnal mites during the time period when the animal was active. Although it is difficult to provide a sufficient explanation for this finding, one hypothesis is that the squirrel of the present case might have been captured using a trap during nighttime when infested by the mites. Otherwise, the mites which infested the squirrel during the nighttime might not return to their hiding place because of the squirrel's movement from place to place. In addition, as populations of poultry red mites, which always exist on the chicken body surface, have been reported (Nakamae et al. 1997a, 1997b), the existence of the mites on the squirrel during the daytime cannot be denied.

Many *Dermanyssus* mite species have been described (Roy & Chauve 2009). Of the mites of this genus, the poultry red mite *D. gallinae* has been mostly found with various species of birds and mammals, in addition to occurrence at chicken ranches (Pritchard et al. 2015). However, *Dermanyssus* mites have not been detected from Pallas's squirrels through investigations conducted in Japan (Shinozaki et al. 2004) or in Argentina (Gozzi et al. 2013). The finding of the present case revealed that the Pallas's squirrels can be a host of *Dermanyssus* mites.

However, lack of detection of the mites in any of the other 26 Pallas's squirrels indicates that the mite infestation is not rife in animals living in that

area. Accordingly, infestation of the present case of the squirrel was not inferred as representing a prevalent condition.

Although the place at which the squirrel of the present case had been infested by the mites was not certain, the possibility exists that the infestation occurred in a nearby chicken ranch if the squirrel had invaded such a structure. Another presumption is that animals such as the Pallas's squirrel might facilitate the transfer of mites among chicken ranches.

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中村有加里・深瀬徹:クリハラリス *Callosciurus erythraeus* から得た *Dermanyssus* 属ダニの一種

要約

2019年4月に神奈川県において捕獲されたクリハラリス1個体の体表からトゲダニ亜目の雌成ダニ4個体を採取した。その形態から、これらのダニは *Dermanyssus* 属のものと同定され、同属のダニの一種であるワクモ *D. gallinae* である可能性が高いと判断した。一方、同地域でほぼ同時期に捕獲されたクリハラリス26個体にはダニの寄生が認められなかったことから、本例における寄生は偶発的なものと推察した。ただし、偶発的とはいえ、クリハラリスが養鶏場間でワクモを伝播する可能性はあると考えた。

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