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## ***Knemidocoptes* sp. on Wild Passerines at the Mai Po Nature Reserve, Hong Kong**

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**ABSTRACT:** Free-ranging passerine birds banded at the Mai Po Nature Reserve, Hong Kong, were affected with a skin disease characterized by crusty, proliferative lesions on legs, feet and beaks. Based on retrospective examination of 1990 to 1992 banding records, 83 of 16,353 birds and 5 of 161 species banded at Mai Po were identified as having these lesions. Eurasian tree sparrows (*Passer montanus*) were most commonly affected (58 of 411 birds) although 19 of 428 black-faced buntings (*Emberiza spodocephala*), 1 of 43 little buntings (*Emberiza pusilla*), 3 of 92 spotted doves (*Streptopelia chinensis*), and 2 of 616 eastern great reed warblers (*Acrocephalus orientalis*) also had clinical signs of infestation. Adult Eurasian tree sparrows were affected more often than juveniles and males were affected more often than females. Lesions on juveniles usually were on the feet while on adults lesions also were found on legs and beak. The effects of this parasitic infestation on body weight of wild Eurasian tree sparrows was not significant.

**Key words:** Ectoparasite, *Knemidocoptes* sp., Eurasian tree sparrow, *Passer montanus*.

Infestation of free-ranging birds by *Knemidocoptes* sp. mites is uncommon. Reports of this disease in one great horned owl (*Bubo virginianus*) (Schulz et al., 1989), two sedge warblers (*Acrocephalus schoenobaenus*) (Fry et al., 1969), a chaffinch (*Fringilla coelebs*) (McDonald, 1962), and a snowy owl (*Nyctea scandiaca*), and accipiters in Great Britain (Cooper, 1985) have been made. In these cases, other than scaly lesions, effects on the host were minimal. Kirmse (1966) reported the prevalence of mite infestation among affected species of birds ranging from 40% in red-winged blackbirds (*Agelaius phoeniceus*) to 1% in

cowbirds (*Molothrus ater*). We examined the prevalence of mites in the free-ranging population of birds at the World Wide Fund for Nature (WWF) Hong Kong Mai Po Nature Reserve, Hong Kong (22°30'N, 114°02'W). Effects of this parasitism as reflected in body weight also were analyzed.

Banding records from the Mai Po Nature Reserve for 1990 through 1992 were retrospectively examined for comments on prevalence of scaly, crusty skin lesions. During routine banding sessions, mist nets were set up at regular locations and birds caught in the nets were removed and banded. We recorded estimated age based on plumage characteristics, sex by cloacal protuberance, and body weight. Presence and location of any dry, scaly, crusty lesions were noted. Smooth, bulbous swellings of the toes of some birds occasionally were seen but were not included in this study. During 1992 skin scrapings were done on several birds with severe lesions. Two of the affected birds which died were necropsied and samples of lesions were fixed in 10% buffered formalin. Fixed tissues were embedded in paraffin and sectioned at 3  $\mu$ m and stained with hematoxylin and eosin for examination by light microscopy.

An analysis of species affected, sex, age class and body part affected was done. Statistical analysis of effect of mite infestation on body weight was done using a Student *t*-test (Kwikstat 3.01©, TexaSoft 1984–1992, Cedar Hill, Texas, USA). Significance was assessed at a level of  $P = 0.05$ .

TABLE 1. Prevalence (%) of *Knemidocoptes* sp. mites on free-ranging bird populations at the Mai Po Nature Reserve, Hong Kong, 1990 through 1992.

	Total birds examined	Mite-infested birds number (%)
Number of birds banded	16,353	106 (0.65)
Number of species banded	161	5 (3.1)
<i>Passer montanus</i> banded	411	58 (14)
Males <sup>a</sup>	87	23 (26)
Females <sup>a</sup>	84	13 (16)
Juveniles	196	16 (8.2)
Adults	215	40 (19)
<i>Emberiza spodocephala</i>	428	19 (4.4)
<i>Streptopelia chinensis</i>	92	3 (3.2)
<i>Emberiza pusilla</i>	43	1 (2.3)
<i>Acrocephalus orientalis</i>	616	2 (0.3)

<sup>a</sup> Sex was not determined for all birds.

Skin scrapings taken from severe lesions confirmed the presence of a mite infestation in affected birds. One Eurasian tree sparrow and one reed warbler were necropsied; both had lesions on the feet and legs consisting of cornified tissue on the plantar surface of the feet and extending partway up the tarsus. These cornified masses were broken at the joint area.

On histopathology, crusty lesions had sections of mites within the epidermis in an area of massive compact orthokeratotic hyperkeratosis. The mass of stratum corneum had a honeycombed appearance and several mites were present in each section. Some mild degree of acanthosis was noted; otherwise deeper layers of the epidermis were not affected. Mites were tentatively identified as *Knemidocoptes* sp. based on the lesions seen grossly and the distribution of mites in burrows of the stratum corneum as seen on histopathological examination. No attempt was made to identify the species.

Eurasian tree sparrows represented only 2.6% of birds banded but were most commonly infested by mites at 14% (Table 1). As with Kirmse (1966), we found that some species of birds had a higher prevalence of infestation than others.

Approximately equal numbers of Eur-

TABLE 2. Distribution of scaly crusty lesions on wild Eurasian tree sparrows (*Passer montanus*) banded at the Mai Po Nature Reserve, Hong Kong.

Group	Foot	Leg	Beak
All sparrows (n = 411)	40	32	2
Males (n = 87) <sup>a</sup>	9	15	1
Females (n = 84) <sup>a</sup>	6	8	0
Juveniles (n = 196)	18	2	0
Adults (n = 215)	21	29	2

<sup>a</sup> Sex was not determined for all birds.

asian tree sparrows identified as males and females, respectively, were banded; however, a preponderance of infection in male birds was noted (Table 1). Based on a chi-square test, these differences were not significant. Similarly, the percentage of adult and juvenile birds banded was approximately equal; however, using a chi-square test, there was a significantly ( $P = 0.007$ ) higher prevalence of mite infestation in adults (Table 1). The increased prevalence in adults may have been partly related to older birds having more time to develop clinically recognizable lesions.

Distribution of mite lesions appeared to progress from foot lesions in juveniles to leg lesions and occasionally beak lesions in adults (Table 2). There were no significant differences in the body weights of infected and uninfected Eurasian tree sparrows, when corrected for age and sex differences.

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