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## ARTHROPOD PARASITES OF THE TREE SPARROW (*PASSER MONTANUS* LINNAEUS, 1758) IN BANGKOK, THAILAND

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### Abstract

*The following arthropod parasites were obtained from 140 specimens of tree sparrow (*Passer montanus* L.), captured by a mist net, in five different areas of Bangkok, Thailand, from September 1982 to April 1983 : biting - lice, *Myrsidea* sp. (Mallophagea : Menoponidae); feather mites, *Analges chelopus* (Herman, 1804) (Acari : Analgidae); *Strelkoviacarus* cf *integer* (Trouessart & Neumann, 1888) (Acari : Analgidae); *Passeroptes* cf *dermicola* (Trouessart, 1886) (Acari : Dermationidae); *Dermoglyphus passerinus* Gaud, 1968 (Acari : Dermoglyphidae); *Proctophyllodes orientalis* Gaud, 1953 (Acari : Proctophyllodidae); *Mesalgoides oscinum* (Kock, 1840) (Acari : Psoroptoididae) and a blood sucking mite, *Bakericheyla* sp. (Acari : Cheyletidae). Accidental parasites and blood sucking mites were also observed and recorded in this paper.*

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The tree sparrow (*Passer montanus* Linnaeus, 1758) is a very common passerine bird living among human habitations and domesticated animal habitats in Bangkok, Thailand. They range throughout Eurasia and northern Africa. The sexes are similar, feeding on grains, vegetables, worms, insects and adapted to feed on cooked food. The nesting places are in trees or cracks of buildings or under the roofs of human dwellings. At Chulalongkorn University, the birds often nest and live in the boxes of some electrical mains switches. They usually use dry grass and straw to build their nests. The mixture used in the nests consist of materials nearby, such as yarns, fragments of plastic ropes, pieces of clothes and natural materials. The birds breed all year round but most frequently in November to May, with the clutch size being 2-6. Because of their colonial habits and habit of dust - bathing, tree sparrows could pose a health hazard to man and domesticated animals. In the recent years, much attention has been focussed on the mite fauna of house

dust, and some pyroglyphid mites have been found to be the main sources of house dust allergens responsible for allergic asthma and rhinitis in a certain percentage of the human population<sup>1,2,3,4</sup>. Surveillance of house dust mites in Bangkok and some provinces in Thailand revealed that mites in the family Pyroglyphidae, i. e. *D. chelidonis*, *D. farinae*, *D. pteronyssinus* and *Malayoglyphus intermedius* were commonly found in house dust. Moreover, it has been proved that these house dust mites cause allergy in humans<sup>5</sup>. The excreta of some pyroglyphid mites also have the same affect as the mites themselves<sup>6</sup>.

The American house dust mite, *Dermatophagoides farinae* Hughes, 1961, was first found in infested poultry and pig meal near Bristol, England in 1975<sup>7</sup>.

In Cornwall, Great Britain, more than 5% of dermatitis cases treated in dermatological outpatient clinics were suspected to be due to ectoparasites of pets<sup>8</sup>.

Various kinds of arthropods usually found on birds include feather mites, blood feeding mites, ticks, louse flies, fleas, sucking lice, chewing lice etc. Some avian ectoparasites have been shown to be involved with arboviral and rickettsial infections in man in Asia<sup>9</sup>. Some blood sucking arthropods can transmit avian disease organisms<sup>10</sup>, and attack man<sup>10,11,12</sup>.

According to Peirce and Mead it was revealed that *Lankesterella* sp. (Protozoa : Lankesterellidae), one of the avian haematozoa, was observed in English sparrows and canaries<sup>13</sup>, the passive vectors being some mites<sup>14</sup>. In addition, *Yersinia* spp. (Bacteria : Enterobacteriaceae), the possible causative agents of so many dangerous human diseases in several countries<sup>15</sup>, were isolated from the tree sparrow in Japan<sup>16</sup>.

Prior to this study, records of the arthropod faunas on bird hosts in Thailand were very limited. The only published study was by McClure *et al.*<sup>9</sup> who reported only 5 specimens harvested at one time of the year. They found 2 species of blood - feeding mites, *Ornithonyssus sylviarum* (Canestrini and Fanzago), 1877 and *Pellonyssus reedi* (Zumpt & Patterson), 1952; feather mite, *Proctophyllodes troncatus* Robin, 1877; lice, *Myrsidea* sp. and *Sturnidoecus ruficeps* (Nitzsch), 1866, and hippoboscid fly, *Ornithophila metallica* (Schiner), 1864. In addition, *Philoaterus fringillae* was found on *P. montanus* in USSR<sup>17</sup> and a bird tick, *Ixodes arboricola* was also collected from the tree sparrow in North Germany<sup>18</sup>. Our investigation will provide more information on the identity and numbers of specimens and their seasonal occurrence. Of more importance, this initial information may in future become useful to public health, environmental health or other areas of medical science. We also include blood feeding arthropods of the tree sparrow in the Bangkok area.

Birds were captured by a mist net, 2m × 8m long with 2 cm mesh, from 5 different areas in Bangkok : Chulalongkorn University (in the lawn between buildings), Dusit zoo (in animal enclosures); Klong Chan (residential area) and Don Muang (open space). Birds were trapped during three periods : September, October 1982 (wet season),

December 1982, January 1983 (early dry season) and March,, April 1983 (late dry season). Ten specimens were collected from each area during each period, and brought to the laboratory.

The following procedures were used to obtain ectoparasites. Both legs of the birds were tied together with a string. The feathers were brushed twice, before and after the birds were sacrificed for endoparasite examination, into 70% ethyl alcohol within a plastic tray. The arthropods in the alcohol were examined by a dissecting binocular microscope and were further processed to make permanent slides<sup>19</sup>. All slides were examined under a phase contrast microscope. Some slides were sent to specialists for confirmation or identification. An ectoparasite is defined when more than one stage of each arthropod was found and more than five individuals of each stage were counted from a tree sparrow host. An accidental parasite is defined when only one stage of each arthropod was found or less than five individuals of each stage were counted.

A total of 140 tree sparrows were caught during 1982-1983. They were found to be infested by ectoparasites from the beginning through to the end of the study. The prevalence of ectoparasite infestation from the tree sparrows was 100%. There were 22 species of acarines and insects found and identified, eight of which were ectoparasites, while the rest were accidental parasites. The prevalence of these ectoparasites included 6 species of feather mites, one species of blood-sucking mite and one species of mallophagan from different areas and seasons, as shown in Tables 1 and 2. The other 14 species of the

**TABLE 1. PREVALENCE OF ECTOPARASITES FROM TREE SPARROWS CAUGHT FROM FIVE DIFFERENT AREAS IN BANGKOK**

Ectoparasites	%					Total
	Chula	Dusit Zoo	Kl. Toey	Kl. Chan	Don Muang	
	(27)	(29)	(27)	(27)	(30)	(140)
<i>Myrsidea</i> sp.	22.2	62.1	55.6	59.3	50.0	50.0
<i>Analges chelopus</i>	25.9	58.6	48.1	25.9	46.7	41.4
<i>Strelkoviacarus</i> cf <i>integer</i>	66.7	37.9	44.4	77.8	53.3	55.7
<i>Passeroptes</i> cf <i>dermicola</i>	25.9	44.8	11.1	44.4	43.3	27.1
<i>Dermoglyphus passerinus</i>	22.2	17.2	18.5	29.6	30.0	23.6
<i>Proctophyllodes orientalis</i>	77.8	96.6	77.8	74.1	80.0	81.4
<i>Mesalgoides oscinum</i>	7.9	34.5	18.5	33.3	30.0	25.0
<i>Bakericheyla</i> sp.	18.5	31.0	25.9	22.2	13.3	22.1

\* Numbers in brackets indicate number of tree sparrows examined

**TABLE 2. PREVALENCES OF THE ECTOPARASITES FROM TREE SPARROWS CAUGHT IN THREE DIFFERENT SEASONS**

Ectoparasites	%			Total
	Wet Season	Early Dry Season	Late Dry Season	
	(47)	(48)	(45)	(140)
<i>Myrsidea</i> sp.	83.0	52.0	13.3	50.0
<i>Analgés chelopus</i>	59.6	56.3	6.7	41.4
<i>Strelkoviacarús</i> cf <i>integer</i>	55.3	31.3	82.2	55.7
<i>Passeroptes</i> cf <i>dermicola</i>	21.3	18.8	42.2	27.1
<i>Dermoglyphus passerinus</i>	36.2	10.4	24.4	23.6
<i>Proctophyllodes orientalis</i>	87.2	77.1	80.0	81.4
<i>Mesalgoides oscinum</i>	36.2	37.5	0.0	25.0
<i>Bakericheyla</i> sp.	48.9	18.8	22.2	22.1

\* Numbers in brackets indicate number of tree sparrows examined

**TABLE 3. LIST OF ARTHROPODS OTHER THAN ECTOPARASITES FROM TREE SPARROWS CAUGHT IN FIVE AREAS IN BANGKOK DURING 1982-1983**

Order	Family	Genus & Species
Mallophaga (chewing lice)	Menoponidae	<i>Myrsidea</i> sp. B
	Philopteridae	<i>Colpocephalum</i> sp. <i>Brueelia cyclothorax</i> <i>Sturnidoecus ruficeps</i>
Acariformes (feather mites)	Proctophyllodidae	<i>Dolichodectis</i> sp. <i>Montesauria mainati</i>
	Pteronyssidae	<i>Pteronyssoides</i> sp.
	Pyroglyphidae	<i>Onychalges asaphospathus</i> <i>Hirstia chelidones</i>
	Syringophilidae	<i>Syringophilus</i> sp.
	Trouessartidae	<i>Trouessartia lonchurae</i>
(Blood sucking mites)	Macronyssidae	<i>Pellonyssus reedi</i>
	Dermanyssidae	<i>Sternostoma tracheacolum</i> <i>Ptilonyssus hirsti</i>

accidental parasites are listed in Table 3. Some of the accidental parasites were known to be nasal mites, *Sternostoma tracheacolum* and *Ptilonyssus hirsti*, and one was a nest parasite, *Pellonyssus reedi*.

The number of ectoparasite species from five different areas are not significantly different (Chi-square test,  $P > 0.01$ ). The prevalence of each ectoparasite species from different areas was similar. The prevalence of *P. orientalis* was markedly high in every area and season. *Myrsidea* sp. showed the highest prevalence in the wet season. In contrast, *Strelkoviacarus* cf. *integer* was highest in the late dry season. But *Mesalgoides oscinum* disappeared in the late dry season.

The species composition of ectoparasites from five areas in Bangkok was similar. This indicates that these parasites are common ectoparasites of tree sparrows in Bangkok throughout the year. It is clear that seasonal change has effects on the biology of some ectoparasites to some extent. In general, the wet season seemed to be the most favourable period for ectoparasites, except for *S.* cf. *integer* which showed highest prevalence in the late dry season. The dry weather may interfere with some stages in the life cycle of *M. oscinum*, whereas weather showed no effect on *P. orientalis*. From this finding, *P. orientalis* appears to be the most obvious common ectoparasite of the tree sparrow.

Seven species of ectoparasites from this study are the new records for Thailand: *Analgés chelopus*, *S.* cf. *integer*, *Passeroptes* cf. *dermicola*, *Dermoglyphus passerinus*, *P. orientalis*, *M. oscinum* and *Bakericheyla* sp.. However, *O. sylviarum*, *P. truncatus*, *O. metallica*, fleas, ticks and sucking lice were not found in this study, but *P. reedi* and *P. orientalis* were found instead of *O. sylviarum* and *P. truncatus* respectively. *P. reedi* was believed to be a nest parasite of the tree sparrow due to its abundant number collected from captured birds kept overnight.

*P. truncatus* was found from *P. montanus* in Taiwan, where the physical environment is different from Bangkok. These mentioned ectoparasites might have specific distributions.

Some ectoparasites might be missing from this study due to technical errors such as during the handling of an individual bird and removal of ectoparasites etc.

The four interesting accidental parasites are *S. tracheacolum*, *P. hirsti*, *Onychalgés asaphospathus* and *Hirstia chelidones*. The first two species cause respiratory acariasis in several kinds of birds<sup>20,21</sup>. The latter two are pyroglyphid mites which may be responsible for house dust allergy in Thailand<sup>7</sup>. However there is no other report concerning the host specificity of those mites in Thailand.

The relationship of the tree sparrows and their arthropod parasites might be considered as medical and veterinary importance in the near future in Thailand due to abundant numbers of the host.

It is interesting to note that an accidental parasite, *Hirstia chelidones*, may have

heterogonic life cycle since it has been reported as a house dust mite. This needs further investigation.

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### บทคัดย่อ

การสำรวจสัตว์ขาข้อที่เป็นปรสิตในนกกระจอกบ้าน (*Passer montanus* Linnaeus, 1758) จำนวน 140 ตัว จับโดยใช้ตาข่ายดักนกในพื้นที่ 5 แห่งของกรุงเทพมหานคร ตั้งแต่เดือนกันยายน พ.ศ. 2525 ถึงเดือนเมษายน 2526 ได้พบสัตว์ขาข้อต่าง ๆ ดังนี้ เหากัด *Myrsidea* sp. ไรขนนก *Analges chelopus*, *Strelkoviacarus* cf *integer*, *Passeroptes* cf *dermicola*, *Dermoglyphus passerinus*, *Proctophyllodes orientalis*, *Mesalgoides oscinum* และไรตุตเลือด *Bakericheyla* sp. นอกจากนั้นยังได้รายงานถึงสัตว์ขาข้ออื่น ๆ ซึ่งมีใช้ปรสิตของนกกระจอกบ้าน แต่ได้พบสัตว์เหล่านั้นจากตัวนกที่ทำการสำรวจในครั้งนี้ด้วย