

PREVALENCE OF ECTOPARASITE INFESTATION IN DIFFERENT AGE GROUPS OF VILLAGE CHICKENS

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SUMMARY

The prevalence of ectoparasite infestations in 158 local village chickens of various age groups is presented. Ten species of ectoparasites were found, which include *Haemaphysalis wellingtoni*, *Megninia cubitalis*, *Menacanthus stramineus*, *Neoschongastia gallinarum*, *Menopon gallinae*, *Liperus caponis*, *Cuclotogaster heterographus*, *Goniodes gigas*, *G. dissimilis* and *Goniocotes gallinae*. The tick, *H. wellingtoni* and the trombiculid, *N. gallinarum*, considered most important since they can cause skin lesions, were commonly observed in high numbers. The prevalence and degree of ectoparasite infestation were closely related to the age of bird. More than one species and higher number of ectoparasites were observed at 12 weeks than at 1 week of age. The lice, *C. heterographus* and *M. stramineus* have not been previously recorded in local chickens.

Keywords: Ectoparasites, village chickens.

INTRODUCTION

The prevalence, life cycle and pathogenicity of some ectoparasite infestations in local chickens have been reported and described by many workers (Rajamanickam, 1968; Zahedi and Jeffery, 1982; Amin-Babjee and Ragavan, 1985; Wu, 1994). They are known to cause damage to feathers, irritation and skin lesions, resulting in either reduced performance of adult chickens or directly harmful to young chicks (Soulsby, 1986). There is, however, no study on the prevalence and degree of ectoparasite infestation in various age groups of village chickens. This paper reports the prevalence and degree of ectoparasite infestation in various age groups of local village chickens, *Gallus domesticus* L

MATERIALS AND METHODS

Village chickens

A total of 158 clinically healthy village chickens were selected from villages in Sungai Sekamat and Semenyih, Selangor. The birds were reared under free-range system. The age of selected birds ranged from 1 week (33 birds), 2 weeks (21 birds), 3 weeks (25 birds), 4 weeks (26 birds), 8 weeks (28 birds) and 12 weeks old (25 birds).

Collection and examination of ectoparasites

The neck, ears and head of every bird were closely examined for ticks, which were collected and stored in 70% alcohol. Following the examinations, all

birds were slaughtered before the typical orange-red skin lesions caused by trombiculid mite larvae were counted. The number of mites from 10 skin lesions were determined under a stereomicroscope. Since the mite larvae were located exactly in the lesion cavity, it was found unnecessary to mount the trombiculid mites for examination.

The skin and feathers were pulled off from the whole carcass, soaked in large beakers containing 70% alcohol and left to sediment, before all ectoparasites were collected and used to determine the total ectoparasite enumeration.

The species of ectoparasite were identified based on the descriptions provided by Rajamanickam (1968), Soulsby (1986) and Stojanovich and Pratt (1962).

RESULTS

Species of ectoparasites

Ten species of ectoparasites were identified in this study. They were the tick, *Haemaphysalis wellingtoni*, the trombiculid mite larvae, *Neoschongastia gallinarum*, the feather mite, *Megninia cubitalis* and the lice, *Cuclotogaster heterographus*, *Goniocotes gallinae*, *Goniodes dissimilis*, *Goniodes gigas*, *Liperus caponis*, *Menacanthus stramineus* and *Menopon gallinae* (Tables 1 to 3).

The lice, *C. heterographus* and *M. stramineus*, which were not recorded in the local check-list of parasites of domestic chicken, were observed for the first time in this study.

Prevalence of ectoparasite species

All the 158 birds were found to be infested with ectoparasites. Most birds (71.1%) had between 3 to 5 species of ectoparasites. The 1-week old chicks and the 12 weeks old birds harboured between 1 to 5 and 3 to 8 species of ectoparasites respectively. None of the birds harboured more than 8 species of the ectoparasites. *Haemophysalis wellingtoni*, *N. gallinarum*, *M. cubitalis*, *M. stramineus* and *M. gallinae* were frequently encountered, while *G. dissimilis* and *G. gallinae* were encountered in less than 3% of the birds, mostly in the 4 and 12 weeks old birds (Tables 1 to 4).

Haemophysalis wellingtoni tick was the most common ectoparasite observed in this study (60% to 100%), followed by *M. cubitalis* (18% to 100%), the louse *M. stramineus* (46% to 88%), the mite larvae *N. gallinarum* (56% to 86%), the louse *M. gallinae* (39% to 92%) and the louse *L. caponis* (19% to 60%). The louse, *C. heterographus*, were observed in 3 to 10%, the louse *G. gigas* in 4 to 12%, the louse *G. gallinae* in 4 to 12% and the louse *G. dissimilis* in 4% to 8% of birds. *Haemophysalis wellingtoni*, *M. cubitalis*, *M. stramineus*, *N. gallinarum* larvae, *M. gallinae* and *C. heterographus* were found at all ages while *G. gigas* and *G. dissimilis* were detected only at 4 weeks of age.

Degree of infestation

The number of *H. wellingtoni* ranged from 2 to 42 ticks per bird, observed in the 8-week old chickens, giving a total number of 701 ticks in this age group, followed by the 3-week old (442 ticks) and the 4-week old (381) groups (Table 1). Similarly, the highest numbers of lesions caused by *N. gallinarum* larvae (279 lesions) were observed in the 8-week old birds (Table 2).

The degree of infestation by lice was as follows: *M. cubitalis* (3750 lice) was observed in the 12-week old birds, followed by the 8-week old (2225 lice) and the 4-week old (993 lice) birds. The 12-week old birds also harboured the highest numbers of other lice, particularly *M. gallinae*, *M. stramineus* and *L. caponis* (Table 5).

DISCUSSION

The tick, *H. bispinosa* had been quoted by Kohls (1957) in his review on ticks of domestic chickens in Malaysia. *H. bispinosa*, *H. doenitzi* and *B. microplus* ticks, however, were not found in this study as well as in previous studies involving domestic chickens (Sani *et al.*, 1986; Amin-Babjee and Lee, 1994; Wu, 1994), even though *H. doenitzi* was observed earlier in a red jungle fowl (Audy *et al.*, 1960), while *B. microplus* was reported by Rajamanickam (1968) in a study of

tick distribution in local domestic animals. *H. wellingtoni* was the only species of tick found in this study while the trombiculid mite *N. gallinarum* and the feather mite *M. cubitalis* were the two species of mite seen. The remaining seven ectoparasite species were all biting lice.

Other than *N. gallinarum*, the only other mite observed in this study was *M. cubitalis*. Mites like *Dermanyssus gallinae*, *Eutrombicula hirsti*, *Lyponyssus bursa* and *Ornithonyssus bursa* that were listed in the parasite check-list of domestic chickens (Lee *et al.*, 1991) were absent. The high prevalence of *H. wellingtoni* and *N. gallinarum* observed in this study was due to the free-range system, which exposed the birds to more species of ectoparasites compared to those kept under the intensive system. The free-range system provides a more sustainable environment for the parasites (Wu, 1994).

The number of *M. cubitalis* mites found in this study was far greater than other ectoparasites. Although this mite was reported to cause severe itching in hen (Lavoipierre, 1958), it is generally quite harmless.

The body louse, *M. stramineus*, could be found in less densely feathered parts of the body such as the thigh, breast and cloaca, and was reported to be quite harmful to small chicks. The shaft louse, *M. gallinae* and the wing louse, *L. caponis* occurred common in chickens but quite harmless (Sani *et al.*, 1986; Lee *et al.*, 1991; Amin-Babjee and Lee, 1994). The lice, *M. stramineus* and *C. heterographus* are now new records for local chickens.

Except for *G. gallinae*, *G. gigas*, *G. dissimilis* and *L. caponis* lice, all ectoparasites were first observed in the first week of age. *Liperus caponis* louse appeared from the second week whereas *G. gigas* and *G. dissimilis* lice were first detected from the third week onwards. The tropical chicken mite, *Ornithonyssus bursa*, which was occasionally found infecting man leading to irritating bites (Amin-Babjee and Ragavan, 1985) was not detected in this study.

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Table 1. Prevalence of *Haemaphysalis wellingtoni* tick in the various age groups of village chicken, *Gallus domesticus* L.

Age in Weeks (No. of Birds)	1 (33)	2 (21)	3 (25)	4 (26)	8 (28)	12 (25)
No. Birds Infected (%)	21 (63.6)	19 (90.5)	25 (100)	24 (92.3)	24 (85.7)	15 (60)
Total Parasites	200	242	442	381	701	119
Range	1-54	2-34	1-62	1-42	2-42	1-21
Mean	9.5	12.7	17.7	15.9	29.2	7.9

Table 2. Prevalence of *Neoschongastia gallinarum* mite larvae and lesions in the various age groups of village chicken, *Gallus domesticus* L.

Age in Weeks (No. of Birds)	1 (33)	2 (21)	3 (25)	4 (26)	8 (28)	12 (25)
No. Birds Infected (%)	26 (78.8)	18 (85.7)	16 (64)	18 (69.2)	21 (75)	14 (56)
Total Lesions (Total Mites)	124 ⁺ (229) ⁺⁺	111 ⁺ (129) ⁺⁺	149 ⁺ (120) ⁺⁺	120 ⁺ (116) ⁺⁺	279 ⁺ (256) ⁺⁺	160 ⁺ (116) ⁺⁺
Lesion Range (Mite Range)	1-11 (3-17)	3-16 (2-18)	2-22 (2-15)	1-19 (2-17)	5-23 (4-23)	2-23 (4-16)
Lesion Mean (Mite Mean)	4.8 (8.8)	6.2 (7.2)	9.3 (7.5)	6.7 (6.4)	13 (12.2)	11.4 (8.3)

⁺ No. of mite larval lesions.

⁺⁺ Total no. of mite larvae per 10 lesions.

Table 3. Prevalence of feather mite, *Megninia cubitalis* in the various age groups of village chicken, *Gallus domesticus* L.

Age in Weeks (No. of Birds)	1 (33)	2 (21)	3 (25)	4 (26)	8 (28)	12 (25)
No. of Birds Infected (%)	16 (49)	18 (86)	25 (100)	24 (92)	28 (100)	25 (100)
No. of Parasite	74	482	636	993	2225	3750
Range No. of Parasite/bird	1-4	2-9	4-92	3-14	7-348	3-446
Average No. per bird	4.6	26.8	25.4	41.4	79.5	150

Table 4. The prevalence of feather lice in various age group of village chicken, *Gallus domesticus* L.

Age in Weeks (No. of Birds)		Mite and lice species						
		<i>Cuclotogaster heterograph</i>	<i>Goniocotes gallinae</i>	<i>Goniodes dissimilis</i>	<i>Goniodes gigas</i>	<i>Liperus caponis</i>	<i>Menacanthus stramineus</i>	<i>Menopon gallinae</i>
1 (33)	No. Infected	1	-	-	-	-	15	13
	(%)	(3)	-	-	-	-	(46)	(39)
	Total	1	-	-	-	-	28	18
	Range (Mean)	-	-	-	-	-	1-4 (1.9)	1-4 (1.4)
2 (21)	No. Infected	2	-	-	-	7	17	13
	(%)	(10)	-	-	-	(33)	(81)	(62)
	Total	2	-	-	-	11	57	26
	Range (Mean)	(1)	-	-	-	1-3 (1.6)	1-10 (3.4)	1-4 (2)
3 (25)	No. Infected	25	1	-	-	8	21	21
	(%)	(100)	(4)	-	-	(32)	(84)	(84)
	Total	636	1	-	-	14	94	106
	Range (Mean)	4-92 (25.4)	-	-	-	1-3 (1.8)	1-16 (4.5)	1-19 (5)
4 (26)	No. Infected	1	-	2	2	5	18	15
	(%)	(4)	-	(8)	(8)	(19)	(69)	(58)
	Total	1	-	2	2	9	62	37
	Range (Mean)	-	-	(1)	(1)	1-4 (1.8)	1-12 (3.4)	1-13 (2.5)
8 (28)	No. Infected	1	1	1	1	9	22	15
	(%)	(4)	(4)	(4)	(4)	(32)	(79)	(54)
	Total	1	1	2	2	27	140	73
	Range (Mean)	-	-	-	-	1-6 (3)	1-29 (6.4)	1-14 (4.9)
12 (25)	No. Infected	2	3	3	3	15	22	23
	(%)	(8)	(12)	(12)	(12)	(60)	(88)	(92)
	Total	5	6	6	6	107	247	208
	Range (Mean)	2-3 (2.5)	1-3 (2)	(2)	(2)	1-44 (7.4)	3-46 (11.2)	1-54 (9)

Table 5. The number of village chickens infested with one or multiple species of ectoparasite

Age	1 Sp.	2 Sp.	3 Sp.	4 Sp.	5 Sp.	6 Sp.	7 Sp.	8 Sp.
1 Week	6	9	8	6	4	0	0	0
2 Weeks	1	1	2	4	9	4	0	0
3 Weeks	0	0	3	6	12	4	0	0
4 Weeks	1	1	6	8	8	2	0	0
8 Weeks	0	3	3	9	8	3	2	0
12 Weeks	0	0	4	5	8	5	2	1
Total Birds	8	14	26	38	49	18	4	1

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RINGKASAN

PREVALENS SERANGAN EKTOPARASIT DALAM KUMPULAN UMUR BERBEZA AYAM KAMPUNG

Prevalens serangan ektoparasit dalam 158 ekor ayam kampung pelbagai kumpulan umur dibentang. Sepuluh spesies ektoparasit ditemui, termasuk *Haemaphysalis wellingtoni*, *Megninia cubitalis*, *Menacanthus stramineus*, *Neoschongastia gallinarum*, *Menopon gallinae*, *Liperus caponis*, *Cuclotogaster heterographus*, *Goniodes gigas*, *G. dissimilis* dan *Goniocotes gallinae*. Sengkenit *H. wellingtoni* dan tungau trombikulid *N. gallinarum* dianggap penting kerana dapat menyebabkan lesi kulit ketara, merupakan yang paling biasa ditemui dalam bilangan tinggi. Prevalens dan tahap serangan ektoparasit kelihatan berkait dengan umur ayam di mana lebih banyak spesies dan bilangan ektoparasit terdapat pada 12 minggu berbanding 1 minggu. Kutu *C. heterographus* dan *M. stramineus* daripada ayam tempatan belum direkodkan sebelum ini.