



Description of a bat parasite, *Chirobia eonycteris* n.sp. (Acari: Astigmata: Teinocoptidae) from Malaysia

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Abstract. A new species of teinocoptid mite, *Chirobia eonycteris* n.sp. is described from the fruit bat, *Eonycteris spelaea*, collected in Pahang, Malaysia. This represents the first record of the genus in Asia. Study of the different stages of the life-cycle indicates that there are two different nymphal stages and that there is sexual dimorphism in the tritonymphal stage.

INTRODUCTION

The family Teinocoptidae Fain, 1959 is comprised of three genera (*Teinocoptes*, *Bakerocoptes* and *Chirobia*) that are exclusively bat-infesting parasites in the tropics. Of the 19 known species of *Teinocoptes*, four species were described from Malaysian bats of the family Pteropidae (Fain & Domrow 1961; Fain & Nadchatram 1962; Fain *et al.* in press). The only known species *Bakerocoptes*, *B. cynopteri* Fain & Nadchatram, 1962 was found on *Cynopterus brachyotis* in Malaysia. The three previously known species of *Chirobia* were collected from African pteroptids (Fain 1959a,b). The species described in this paper, *Chirobia eonycteris* n.sp. recovered from the Cave Fruit Bat, *Eonycteris spelaea*, in a limestone cave in Pahang represents the first record of the genus *Chirobia* in Asia. The mites were found in small lesions on the dorsal surface of the wings and patagium. Mites of the family Teinocoptidae are minute, soft-bodied and pallid. They show considerable reduction in the development and number of legs, especially legs IV. In the genus *Chirobia*, legs IV are completely lost and legs I-III show extreme reduction (except in the male). The stages in the life-cycle of teinocoptid mites are: egg, larva, protonymph, tritonymph, adult male and female. The

mites are ovo-viviparous. The present study has shown the presence of two nymphal stages and there is also indication of sexual dimorphism in the tritonymphal stage in the genus *Chirobia*.

The medical or veterinary importance of this group of mites is unknown. However, these mites would illustrate physiological specificity to their hosts and, if so, species of Teinocoptidae could be utilised as ecological indicators for better understanding of the zoogeography of the bat hosts. Host-parasite relationships and the reaction of host tissues to invasion of teinocoptid mites are well documented by Lavoipierre *et al.* (1967). The new species described here was collected by one of us (F.S.L.) in 1979 during a 6-week collecting trip in Malaysia at the invitation of the Institute for Medical Research, Kuala Lumpur.

The holotype female (coll.no. 1981.4.7.15) and the allotype male (coll. no. 1981.4.7.16) are deposited in the British Museum (Natural History), London. Paratypes are deposited in the U.S. National Museum (Smithsonian Institute), Washington, D.C.; Bishop Museum, Honolulu, Hawaii; Zoologisches Institut und Zoologisches Museum, Hamburg; Rijksmuseum van Natuurlijke Historie, Leiden; Acarology Laboratory, Ohio State University, Columbus, Ohio; Field Museum of Natural History, Chicago; and in the collection of the authors.

Measurements are presented in tabular form (Table 1), and all measurements are given in micrometres (μm).

DESCRIPTION OF SPECIES

Chirobia eonycteris n.sp. (Figures 1–6)

Diagnosis

The female of the new species differs from the females of the other three known species (all African) in having dorsal striations and scale-like reticulations of the cuticle surrounding the anal region. The average length of the anal setae in the new species is 40 (33–50). The anal setae of females of *C. congolensis* (Fain 1959a) and *C. othophaga* (Fain 1959b) measure 15–20 and less than 35 respectively. In *C. squamata* (Fain 1959a) the anal setae are distinctly longer (75–90). The male of the new species can be separated from the male of *C. congolensis* by the presence of dorsal striations and by having only three, not four pairs of sclerotized scales or formations (SF) on the ventro–median region of the idiosome. The larva of the new species can be separated easily from the larva of *C. congolensis*: the cuticle of the posterior region of the dorsum being reticulated, as figured (Fig. 5).

Description

Female (holotype): Length 321, average of 10 paratypes 306 (272–332);

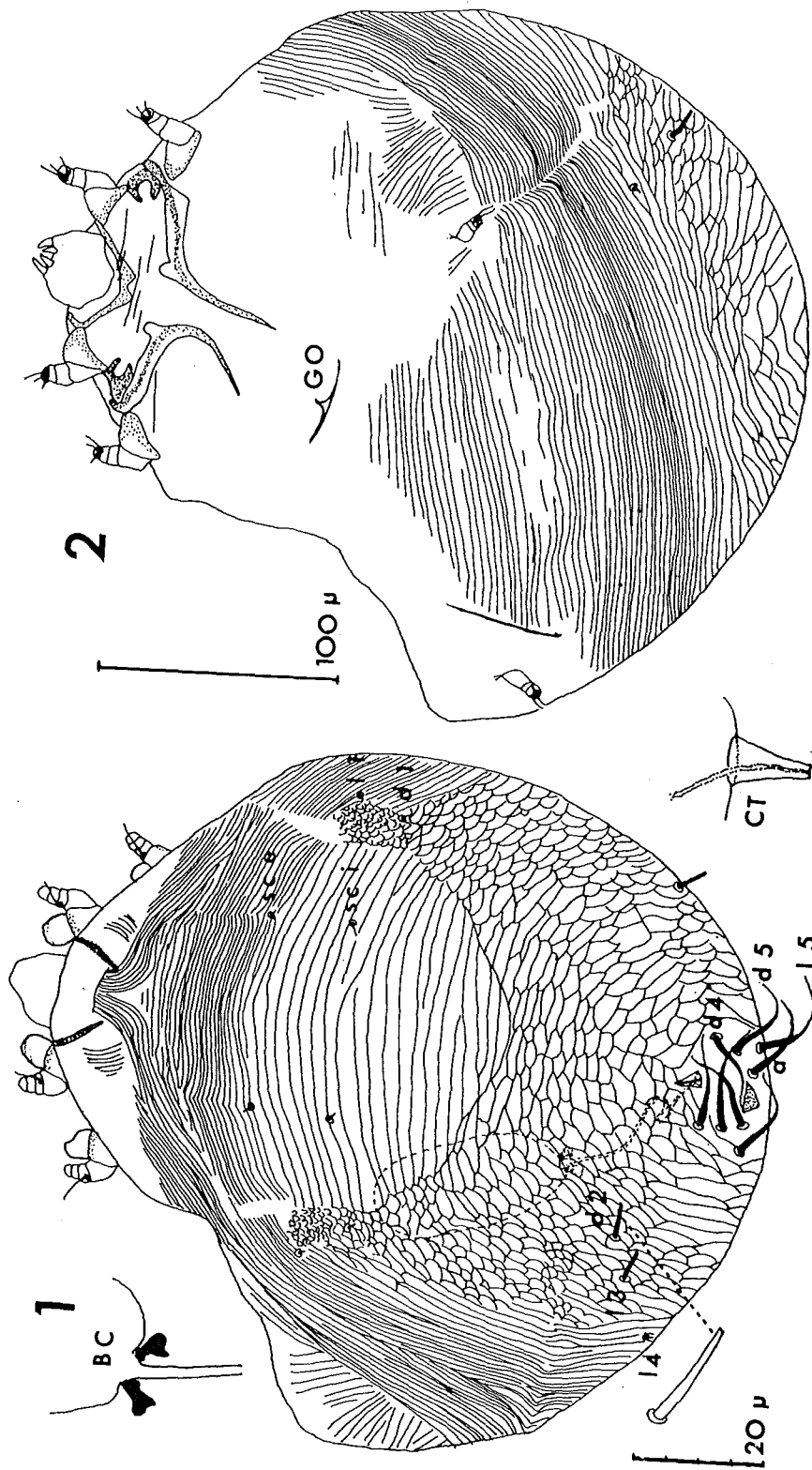
with 268, average 282 (248–317). *Dorsum* (Fig. 1): cuticle of anterior portion transversely striated, posterior portion, including the subterminal anal region, reticulated. Sclerotization restricted to two small bands on propodosoma, extending to epimera I. Anterior setae very short, minute; *v i* not easily seen, *d 2* and *l 3* spinose with indistinct furcate tips; circum-anal setae long and tapering. Bursa copulatrix (BC) large with long duct (90), opening on conical shaped copulatory tube (CT). *Venter* (Fig. 2): Epimera I fused and W-shaped; epimerites I extend to epimera II to form sickle-shaped sclerotization. Epimera II long and free. Legs non-functional, relatively small with indistinct setation. Trochanters I and II with large dorsal flaps. Genital opening transverse, not easily discernable; genital apodemes absent. Genital, coxal and humeral setae absent. Eggs, seen in several females, are large in relation to female body size. Average length of 10 eggs 176 (152–203), width 115 (94–146). Usually one egg per female, three being the maximum number seen in one female.

Male (allotype): Three males were forcibly removed from tritonymphal skin, thus all three specimens were damaged. Male disc-shaped, yellowish, with fairly sclerotized idiosome and functional legs. *Dorsum* (Fig. 3): Central and posterior surface with pitted shields that appear to be fragmented and without distinct margins; anterior and lateral surface striated, as figured. The dorsal setae *v i*, *sc e*, *sc i*, *d 1*, *d 2*, *d 4*, *d 5*, *l 1*, *l 3*, *l 4*, *l 5*, *h* and *sh* are present. Circum-anal setae and *l 4* short. Anal region subterminal and dorsally inserted. *Venter* (Fig. 4): Epimera I fused to forked sternum and fused with epimera II. Coxal regions I and II fairly sclerotized. Three pairs of lateral scale-like formations (SF) are present in mid-field of idiosome. Epimera III and IV free, the coxal field less sclerotized. Genital region subterminal. Coxal setae I, II and III long and tapering, coxal seta IV absent. Three pairs of short genital setae are present, the posterior pair inserted within the genital plate. Legs I and II with five free segments, legs III and IV with four segments (tarsus and tibia fused), legs IV being most reduced. *Trochanter* I and II with a prominent hook on dorsal aspect. A triangular spur (H), laterally orientated, is present on ventral aspect of femora I and II. Genua I and II with one long solenidion *sigma* and a microsolenidion (SO) that is indistinct. Tarsi with spine-like and filiform setae; solenidion *omega* I proximally and *omega* II distally inserted. Pretarsi I and II stalked with ambulacral discs.

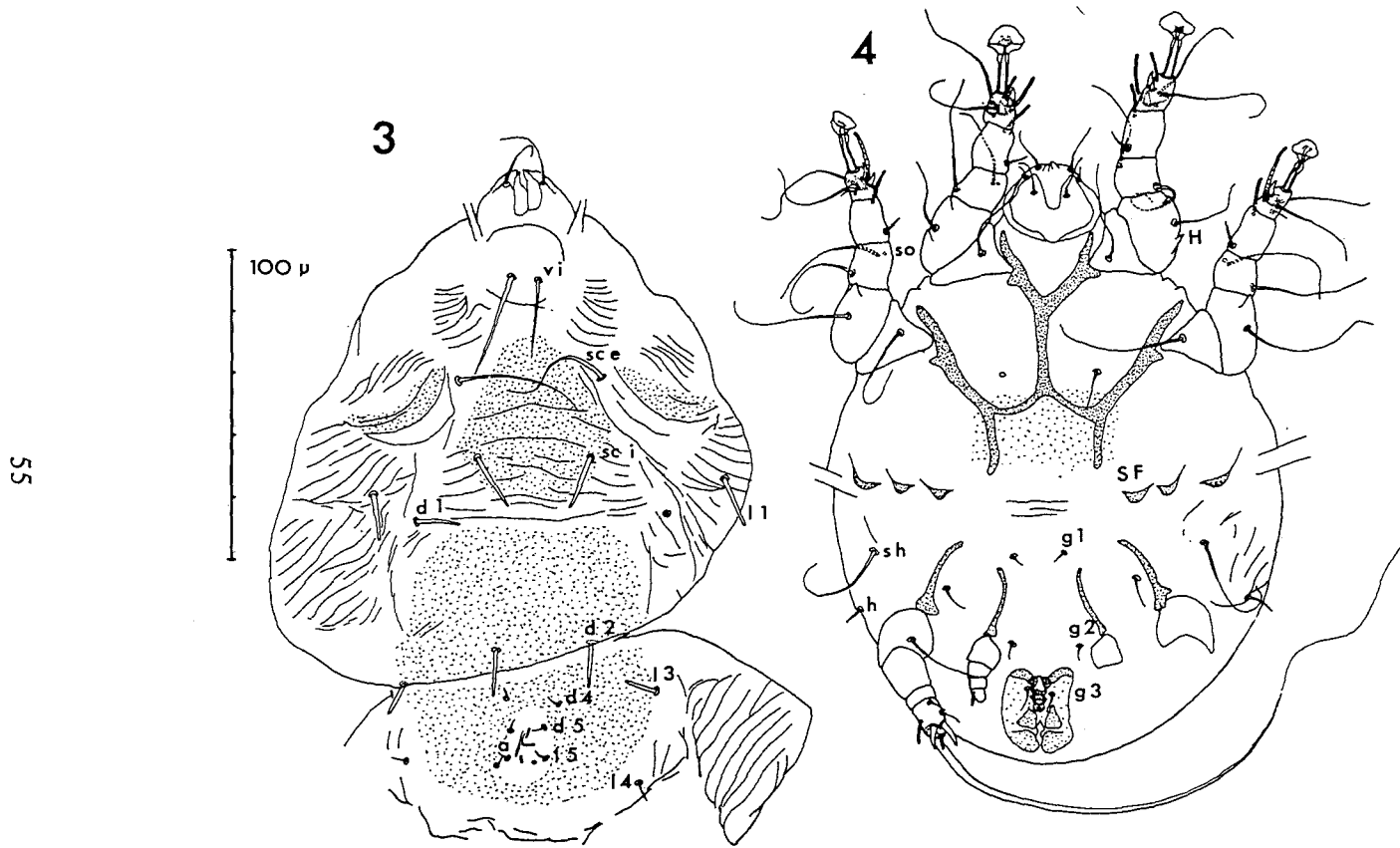
Chaetotaxy of legs as follows:

	Chaetotaxy	Solenidiotaxy
Tarsi	6-6	2-1
Tibiae	1-1-6-0	-1-1
Genua	1-1-0-0	2-2-0-0
Femora	1-1-0-0	
Trochantera	1-1-1-0	

Terminal setae of legs as long as the body (measurements in Table I).



Figures 1,2. *Chirobia eonycteris* n.sp. Female, holotype. 1. Dorsum; 2. Venter.



Figures 3, 4. *Chirobia eonycteris* n.sp. Male, allotype. 3. Dorsum; 4. Venter.

Larva: Broadly elongated, with functional legs and female-like sclerotization. *Dorsum* (Fig. 5): Propodosoma with a small somewhat U-shaped shield, bearing a pair of short vertical internal setae (*vi*). Anus terminal, with three pairs of circum-anal setae. Striations and reticulations of idiosome similar to female. Setae *sc e*, *d l* and *l 4* much longer than in female. Venter (Fig. 6): Epimera free and oriented as figured. Podosoma without striations, but lightly sclerotized; opisthosoma transversely striated. Coxal setae I and III and subhumeral (*sh*) present. Legs I and II with five free segments and stalked ambulacra, the stalk shorter than in males; Legs III with four free segments and one terminal seta 45 μ m long.

Chaetotaxy of legs as follows:

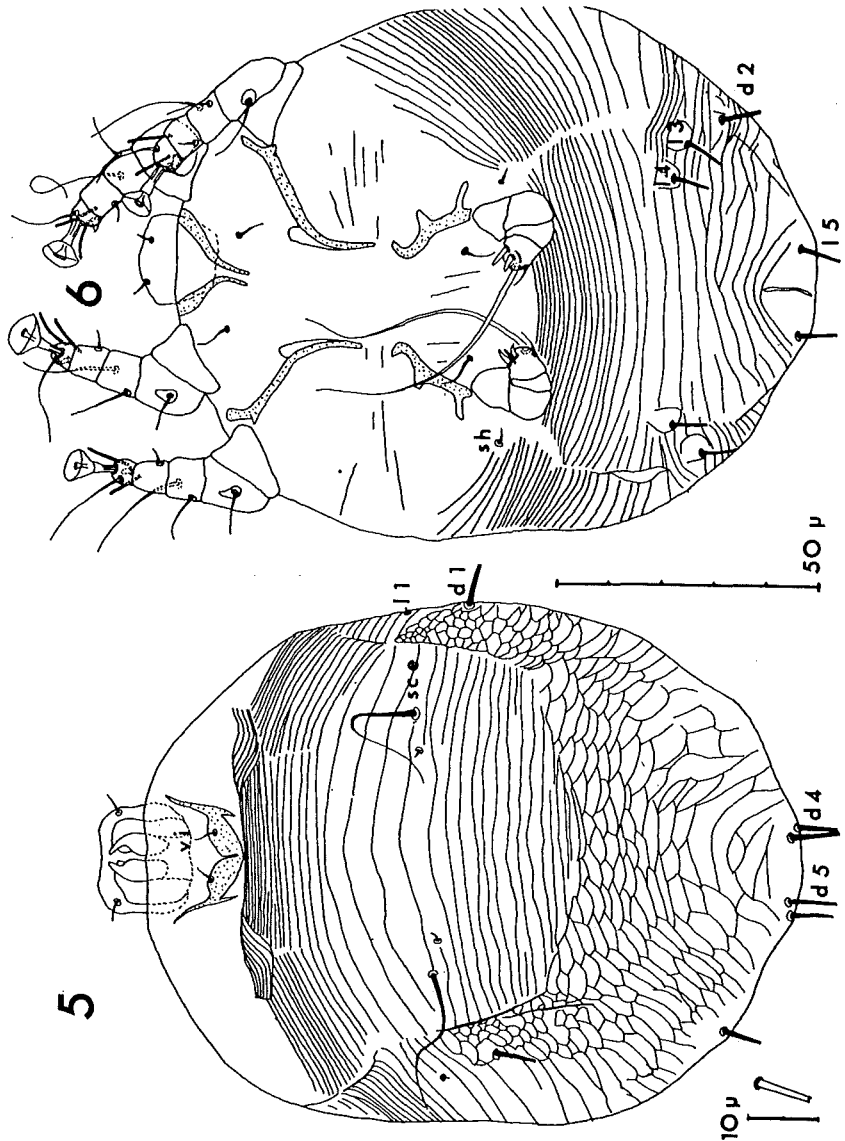
Tarsi	5-5
Tibiae	1-1
Genua	1-1-0
Femora	1-1-0
Trochantera	1-1-0

Nymphs display characteristics of female, but lack bursa copulatrix and copulatory tube. *Protonymph* of small size; measurements: length 195 (181-205), width 170 (167-181), *d* 2 7 (6-8), *l* 5 16 (15-19). Measurements of *male tritonymph*: length 225 (221-238), width 201 (193-211), *d* 2 9 (9-10), *l* 5 21 (20-23). Measurements of *female tritonymph*: length 242 (231-255), width 220 (206-236), *d* 2 11 (10-14), *l* 5 25 (23-28).

TYPE MATERIAL

Holotype female and allotype male ex Cave Fruit Bat, *Eonycteris spelaea* (Dobson, 1871), from limestone cave, Raub, Pahang, Malaysia. Collected on 13 May 1979 by A.L. Rudnick for Institute for Medical Research, Kuala Lumpur. Paratype adults and immature stages with same data as holotype.

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Figures 5, 6 *Chirobia conycyteris* n.sp. Larva. 5. Dorsum; 6. Venter.

TABLE 1. Measurements of *Chirobia eonycteris* n.sp.

	females			male allotype	larvae		
	holotype	average (n = 10)	range		figured	average (n = 8)	range
length	321	306	272–332	205	130	133	123–146
width	268	282	248–317	159	98	100	90–107
<i>vi</i>				35	4	4	4
<i>sc e</i>	2	1	1– 2	41	36	36	31– 41
<i>sc i</i>	4	3	2– 4	23	2	3	2– 3
<i>d 1</i>	2	2	2– 3	16	10	10	9– 12
<i>d 2</i>	18	19	15– 23	15	9	10	9– 11
<i>d 4</i>	46	42	34– 49	5	10	10	9– 10
<i>d 5</i>	49	45	39– 53	5	11	11	10– 12
<i>l 1</i>	1	1	1– 2	17	1	1	1
<i>l 3</i>	15	16	13– 19	14	9	10	9– 12
<i>l 4</i>	2	2	1– 2	6	8	8	7– 9
<i>l 5</i>	51	45	35– 53	4	10	10	10– 12
<i>a</i>	43	40	33– 50	5			
<i>h</i>				6			
<i>sh</i>				51	4	3	2– 4
<i>cx I</i>				19	6	7	6– 8
<i>cx III</i>				10	7	7	7– 8
<i>g 1</i>				6			
<i>g 2</i>				6			
<i>g 3</i>				4			

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