

## A new species of *Teinocoptes* (Acari, Astigmata, Teinocoptidae), with a key to Malaysian species

J.S.H. Klompen<sup>1</sup>, F.S. Lukoschus<sup>1</sup>, M. Nadchatram<sup>2</sup>, and A. Fain<sup>3</sup>

<sup>1</sup> Department of Aquatic Ecology, Catholic University, Nijmegen, Toernooiveld, 6525 ED Nijmegen, The Netherlands.

<sup>2</sup> Department of Zoology, National University of Singapore, Singapore 0511.

<sup>3</sup> Institut Royale des Sciences Naturelles de Belgique, Rue Vautier 31, B-1040 Bruxelles, Belgium.

**Abstract.** A new species, *Teinocoptes amphipterion* is described and illustrated from female, nymph and larva. The host, *Cynopterus brachyotis* was collected in three different localities in Malaysia. A key to the 5 known Malaysian species is given.

### INTRODUCTION

In this paper a fifth Malaysian species of *Teinocoptes* Rodhain, 1923, *T. amphipterion* new species is described and illustrated. The genus *Teinocoptes* is one of three genera in the family Teinocoptidae and a brief introduction to the family has been given previously (Fain *et al.*, 1982). Species of *Teinocoptes* are bat parasites. Though several thousands of bats of varied species have been examined in Malaysia by one of us (M.N.), the five Malaysian species are known only from the frugivorous bat of the family Pteropidae (*T. asiaticus* Fain and Domrow ex *Cynopterus brachyotis*; *T. malayi* Fain and Nadchatram ex *Eonycteris spelaea* and *Macroglossus* sp. probably *minimus*; *T. pahangensis* Fain *et al.* ex *E. spelaea*; *T. eonycteris* Fain *et al.* ex *E. spelaea* and *T. amphipterion* n. sp. ex *C. brachyotis*. These soft-bodied, pallid mites ranging in length from 0.35 to 1.0 mm usually attach to the wing membrane of the hosts and cause skin lesions. They are often observed partly or completely embedded in the wing membrane, which is the favourite site of attachment. They are generally host-specific and this is reflected in the reduction in the dimensions of legs. Furthermore, legs IV are vestigial or completely absent.

### DESCRIPTION OF SPECIES

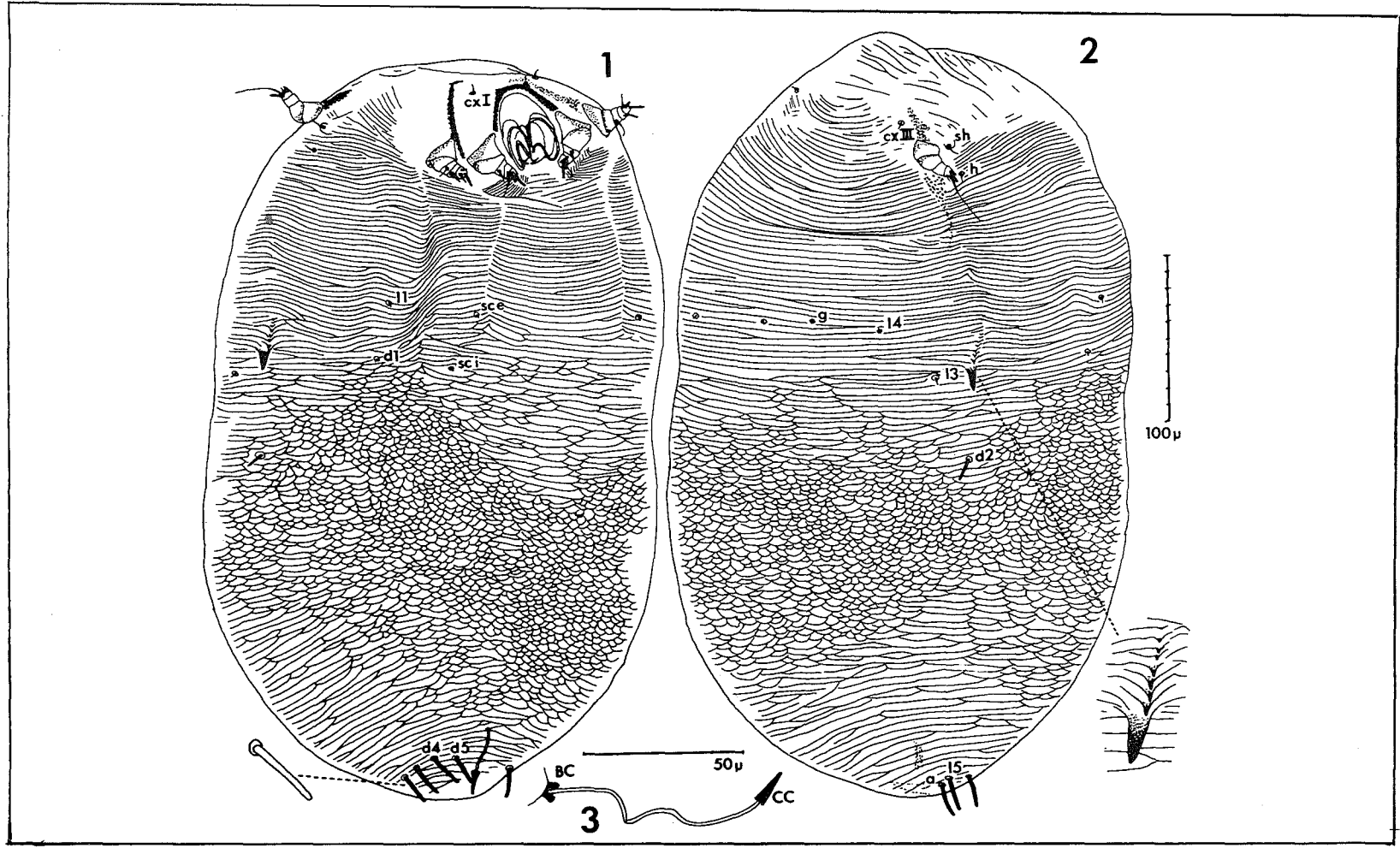
*Teinocoptes amphipterion* n. sp. (Figs. 1-5)

### Diagnosis

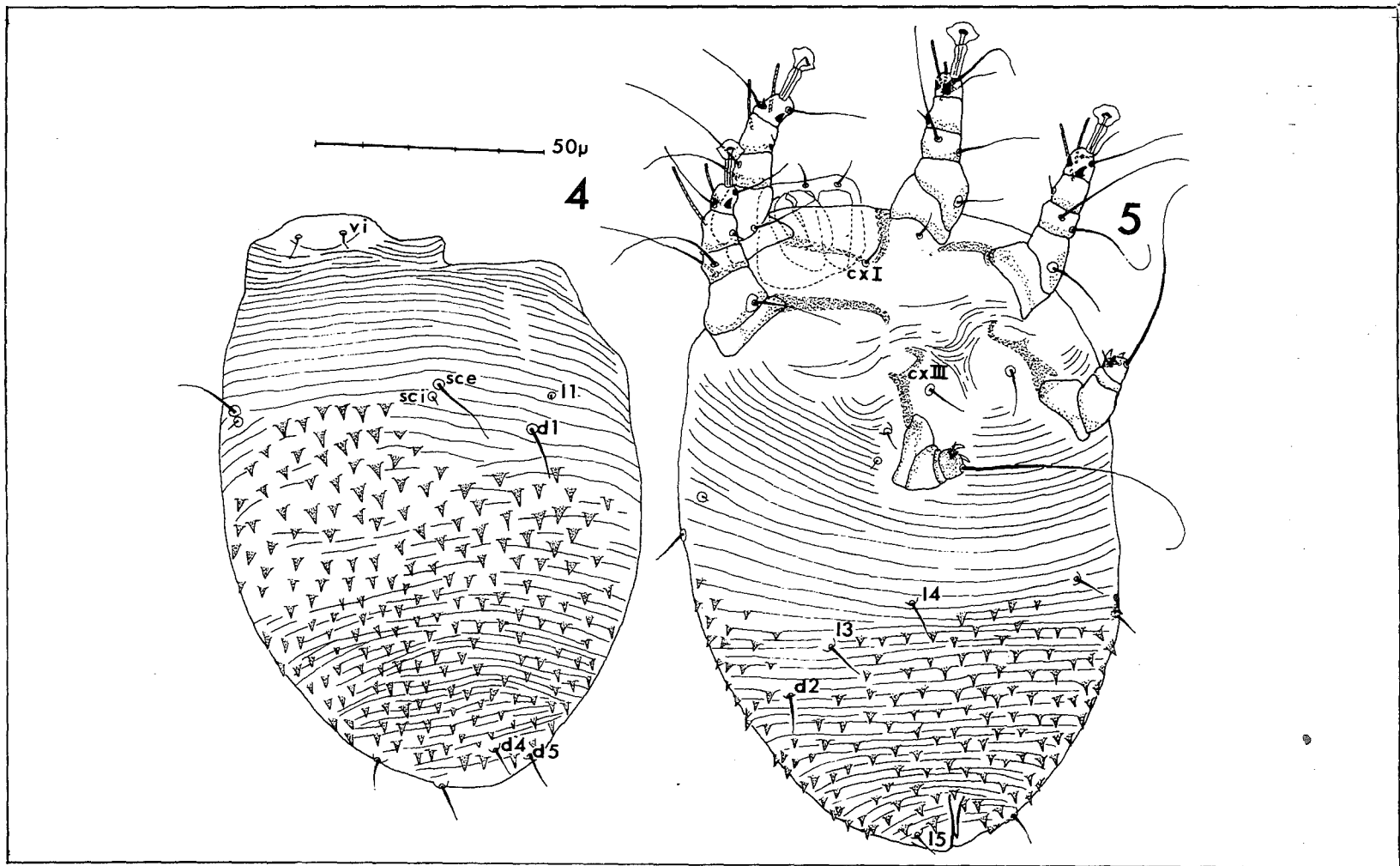
Described from female, nymph and larva; male unknown. All measurements are given in micrometres ( $\mu\text{m}$ ). The new species is unique in having an extra pair of setae corresponding to the *h* setae of Sarcoptidae in both the female and larva. In the female legs IV absent in most of 48 specimens examined; in a few specimens legs IV greatly reduced or vestigial and located medio-ventrally to legs III. The new species is intermediate between *Teinocoptes* and *Chirobia*. However, it differs from *Chirobia* as it lacks an antero-lateral protrusion on epimera II of the larva. The discovery of the male will resolve the generic status of the new species, but for the present it is best accommodated in *Teinocoptes*. The female differs from all other species of *Teinocoptes* in the size of a vertical row of spines, of gradually increasing length, located on the venter of idiosome (Fig. 2), the largest spine measuring 15. In other species of *Teinocoptes* these spines are either present or absent; if present, they are always very minute. The larva is easily distinguished by the presence of numerous triangular scales (over 200) in the opisthosomal region.

### Description

**Female:** Idiosome broadly elongate. Length of holotype 444, mean of 10 paratypes 474 (413-540), width 272, mean 285 (240-309). **Dorsum:** cuticle median with a large scaly area forming a broad ring around idiosome;



Figures 1 - 3. *Teinocoptes amphipterion* n. sp. Female. 1. Dorsal view; 2. Ventral view; 3. Bursa copulatrix.



Figures 4–5. *Teinocoptes amphipterion* n. sp. Larva. 1. Dorsal view; 2. Ventral view.

anterior and posterior to this ring idiosome densely striated. Without sclerotization on dorsal opisthosoma. Anterior dorsal setae very minute (1–2). The dorsal setae *d 2*, *l 3*, and *l 4* are ventrally located (Fig. 2). Anus terminal; with 4 pairs of circumanal setae, long with blunt tips, 2 pairs dorsal and 2 ventral. Bursa copulatrix (BC) with 1–2 loops, mean length 115 (89–126), broken in holotype; bursa ending in a dorso-terminal copulatory cone (CC), 13 long (10–14). *Venter*: A small verrucose area posterior to leg III present. Two vertical rows of spines of gradually increasing length present in the mid region of idiosome; posterior vertical spine most prominent, 12 long, mean 11 (5–15). In a few paratypes 3 or 4 enlarged spines, of

smaller size, replace the one dominant posterior spine. Genital slit apical and hardly discernible; genital apodemes absent. Setae on coxa I (cx I) and cx III small; *sh* setae long on prominent nipple; *h* setae small. Setae *d 2* strong with blunt tips; *l 3* setae 5 long (5–7), other anterior setae very minute (1–2). Setae *g* present, also very minute. Measurements are given in Table 1. *Legs*: Chaetotaxy of legs I–III as in other *Teinocoptes* (vide Fain, 1959) except for the absence of a seta on trochanter III. Legs very short, legs I distinctly longer than legs II: 30 (26–33) and 25 (25–30), respectively. Legs IV absent in most specimens, present in a few paratypes in a greatly reduced form.

Table 1. Some measurements\* on females and larvae of *T. amphipterinon* n. sp.

	Female			Larva		
	Holo-type	Average n = 10	Range	Figured specimen	Average n = 10	Range
Total length	444	474	413–540	152	150	141–155
Total width	272	285	240–309	96	96	90–102
<i>vi</i>				3	3	2–4
<i>sci</i>	1	1	1	2	1	1–2
<i>sce</i>	1	1	1–2	15	16	12–19
<i>d 1</i>	1	1	1	16	12	10–16
<i>d 2</i>	13	12	10–14	10	9	8–10
<i>d 4</i>	21	22	18–26	10	8	6–10
<i>d 5</i>	18	19	17–20	10	8	6–10
<i>l 1</i>	1	1	1–2	1	1	1
<i>l 3</i>	5	5	5–7	11	11	10–12
<i>l 4</i>	2	1	1–2	8	8	7–9
<i>l 5</i>	18	21	18–24	11	11	10–12
<i>h</i>	2	3	2–5	1	1	1–2
<i>sh</i>	11	11	9–15	4	5	4–7
<i>g</i>	1	1	1			
<i>cx I</i>	3	3	2–4	7	8	7–10
<i>cx III</i>	3	3	2–5	11	11	10–12
longest spine in file	12	11	5–15			
bursa copulatrix (BC)	–	115	89–126			
copulatory cone (CC)	12	13	11–14			
terminal seta leg III				68	61	56–68

\*All measurements in  $\mu\text{m}$ .

*Male*: Unknown.

*Nymph*: Only 2 nymphs were found. They differ from female in having shorter circumanal setae (4-5), lacking row of ventral spines and scaly cuticular pattern of idiosome. They measured 276 x 194 and 272 x 161.

*Larva*: Slightly oval with functional legs. Length of figured specimen (including gnathosoma) 152, mean of 10 paratypes 150 (141-155); width 96, mean 96 (90-102). *Dorsum* transversely striated, excepting a small area bearing *v i* setae. Over 100 triangular scales in the area between scapular setae and anus, the scales arranged in irregular rows. The *sc e* and *d l* setae much longer than in female; *d 2, l 3*, and *l 4* setae are ventral. Anus terminal with 3 pairs of circumanal setae, long and filiform; 2 pairs dorsal and 1 pair ventral.

*Venter*: Opisthosoma striated, with approximately 100 triangular scales in posterior region. Podosoma less striated. Epimera well developed, epimera I joined. Setae on cx I and cx III long and filiform; *sh* setae conspicuous; *h* setae minute. Posterior setae long and filiform arising from small nipples. Gnathosoma with a single pair of setae. Leg chaetotaxy and solenidiotaxy:

Tarsus	4 - 4 - 4	1 - 1 - 1
Tibia	1 - 1	1 - 1
Genu	2 - 2 - 0	0 - 0 - 0
Femur	1 - 1 - 0	
Trochanter	0 - 0 - 0	

Legs I and II with well developed pedicels. Terminal setae of legs III half the length of idiosome.

*Eggs*: The holotype did not contain eggs. The highest number of unembryonated eggs and larvae in 48 females was three. Mean length and width of 11 eggs 214 (186-243) x 126 (105-146).

**Host and locality**: *Cynopterus brachyotis* (Müller), Dog-faced fruit bat, Gombak Forest Reserve, Pahang Road, 25 km from Kuala Lumpur, 6th November 1982; compound of Inst. Med. Research, Kuala Lumpur, 4th November 1982; Taman Negara (National Park), Pahang 19th October 1982; MALAY-

SIA. Total number of specimens collected 48 females, 2 nymphs, 10 larvae. The bats were trapped in mist nets, and the mites collected by F.S. Lukoschus.

*Note*: The species name is derived from the Greek *amphi*: on both sides, and *pterinos*: winged, and refers to the resemblance of the lateral spines to small wings, which is an outstanding feature of this species.

**Deposition of type material**: Holotype female, BM (NH) 1983.7.26.11 and figured larva, BM (NH) 1983.7.26.12 deposited in the British Museum (Natural History), London. Paratypes deposited as follows: U.S. National Museum of Natural History (Smithsonian Institution), Washington, D.C.; Field Museum of Natural History, Chicago. The Acarology Laboratory, Ohio State University, Columbus, Ohio, U.S.A.; Bishop Museum, Honolulu, Hawaii; Rijksmuseum van Natuurlijke Historie, Leiden; Zoologisch Instituut and Zoologisch Museum, Hamburg; Museum National d'Histoire Naturelle, Paris; Raffles Collection, Department of Zoology, National University of Singapore, Singapore 0511; and in the collection of the authors.

**KEY TO MALAYSIAN SPECIES OF *TEINOCOPTES***

**Female**

1. - Cuticle of more than half of the dorsum scaled (as in Fig. 1) . . . . . 2
  - Scaly area not exceeding 1/3 of the dorsum . . . . . 3
2. - Scaly area limited to the dorsum. Without conspicuous row of spines on ventral idiosoma. Length of idiosoma up to 1000 . . . . .
  - T. asiaticus* Fain & Domrow, 1961
  - Scaly area continuing on the venter. Latero-median row of spines conspicuous. Length 400-550 . . . . .
    - T. amphipterion* n. sp.
3. - Length not exceeding 350. Only a few scaly patches on dorsum . . . . .
  - T. eonycteris* Fain et al., 1982

- Length over 500. U-shaped median scaly area present on dorsum . . . . 4
- 4. — Bursa copulatrix 350–400. Postvulvar area large and strongly sclerotized. . . . .  
*T. pahangensis* Fain *et al.*, 1982

- Bursa copulatrix 50–70. Postvulvar area smaller; width not exceeding half the distance between legs III.  
*T. malayi* Fain & Nadchatram, 1962

**Larva**

- 1. — Triangular scales present on the dorsum . . . . . 2
  - No such scales present . . . . .  
*T. malayi* Fain & Nadchatram, 1962
- 2. — Number of scales 60–90 . . . . . 3
  - Total number of scales exceeding 200 . . . . .  
*T. amphipterinon* n. sp.
- 3. — Scaly pattern in area between *d* 2 and *d* 4 setae, halfway surrounding the anus. . . . .

- T. pahangensis* Fain *et al.*, 1982
- Area between *d* 2 and *d* 4 setae not scaly . . . . .  
*T. asiaticus* Fain & Domrow, 1961

**REFERENCES**

Fain, A. (1959). Les acariens psoriques parasites des chauves-souris. IV. Le genre *Teinocoptes* Rodhain. Creation d'une nouvelle famille: Teinocoptidae (Sarcoptiformes). *Revue de Zoologie et de Botanique Africaines* 59: 118–136.

Fain, A. & Domrow, R. (1961). Les acariens psoriques parasites des chauves-souris. XIX. Une nouvelle espece de *Teinocoptes* chez une roussette de Malaisie. *Bulletin Annales Societe Royale Entomologie Belgique* 97: 179–187.

Fain, A. & Nadchatram, M. (1962). Les acariens psoriques des chauves-souris, XXI. *Teinocoptes malayi* n. sp. *Bulletin Annales Societe Royale Entomologie Belgique* 98: 248–251.

Fain, A., Lukoschus, F.S. & Nadchatram, M. (1982). The genus *Teinocoptes* Rodhain, 1923 (Acari, Astigmata, Teinocoptidae) in Malaysia and Indonesia. Description of three new species. *Bulletin Annales Societe Royale Belge Entomologie* 118: 73–79.