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## THE HYPOPI OF THE GENUS *SENNERTIA* OUDEMANS, 1905, DESCRIBED BY OUDEMANS (ACARINA, SARCOPTIFORMES)

by

**A. FAIN**

Instituut voor Tropische Geneeskunde „Prins Leopold”,  
Antwerpen, Belgium

With 16 text-figures

### INTRODUCTION

Oudemans has described several species of mites of the genus *Sennertia*, most of them only after their heteromorphic deutonymphs (or hypopi).

These species live as adults in the nests of Hymenoptera, especially bees, and are transported phoretically from nest to nest by means of their heteromorphic deutonymphs which attach themselves to the adult bees.

Since the time that Oudemans published his material numerous new species of *Sennertia* have been described in several parts of the world. In order to recognize these species, generally known only after their hypopial stage, it has become necessary to utilize new morphological criteria. Therefore a new and more complete description of the old species is needed. The present paper is devoted to the redescription of the hypopi of *Sennertia* described by Oudemans and which are deposited in the Oudemans collection at the Rijksmuseum van Natuurlijke Historie at Leiden.

### **Sennertia** Oudemans, 1905

#### **Sennertia koptorthosomae** (Oudemans, 1901) (figs. 1-2)

*Trichotarsus koptorthosomae* Oudemans, 1901b: 81, pl. 3 figs. 53-54 (in part).  
*Sennertia koptorthosomae*; Oudemans, 1924: 329.

Dr. L. van der Hammen has sent us five slides of the species "*Sennertia koptorthosomae*". Three of these slides are labelled "*Koptorthosoma tenuiscapa* Westw., ♀, Java, Oct. 1900. J. D. Alfken". The catalogue numbers are nos 3, 4 and 5, respectively. One is labelled "*Koptorthosoma tenuiscapa* Pera-

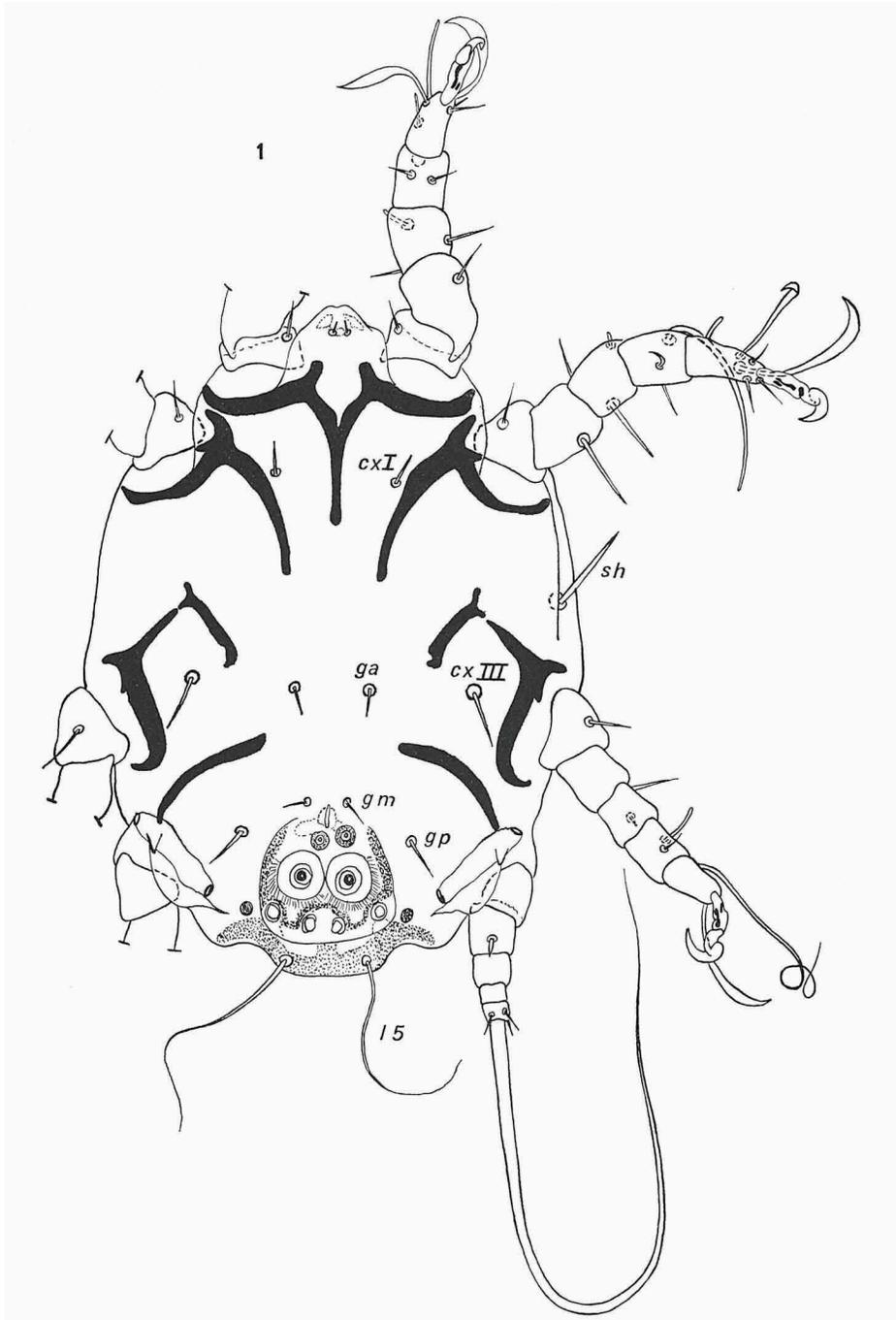


Fig. 1. *Sennertia koptorthosomae* (Oudemans), lectotype (hypopus), ventral view.

deniya, Ceylon 02.02.1904. E. Ernest Green leg; catal. no 1". The fifth slide is labelled "Nest van *Koptorthosoma* ... Medan. Deli. 1919. Dr. W. Roepke leg. Cat. no. 2.11".

As a matter of fact, in the slides from Java we have recognized two closely related, though different species of *Sennertia*. One is *S. koptorthosomae*, the other is a new species that is described below.

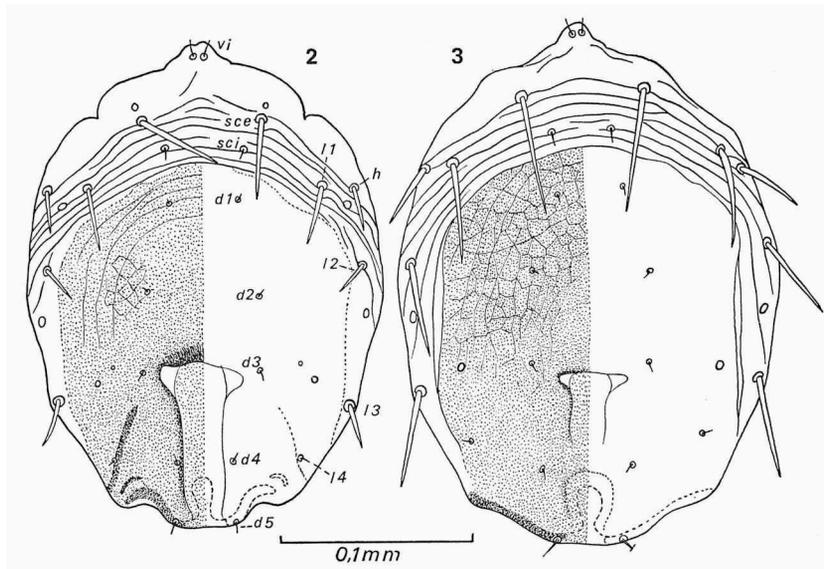


Fig. 2. *Sennertia koptorthosomae* (Oudemans), lectotype (hypopus), dorsal view. Fig. 3. *Sennertia vanderhammeni* spec. nov., holotype, idem.

On the slide from Ceylon we found only specimens of this new species.

The slide from Medan, Deli, contains one specimen of *S. koptorthosomae*.

As Oudemans did not designate a holotype of this species, we select here a lectotype from among the syntypes from Java (cat. no. 3).

Lectotype (hypopus) of *S. koptorthosomae*. This specimen corresponds exactly to the description and the figures given by Oudemans. We think therefore that it really represents the species of Oudemans. This specimen is 237  $\mu$  long and its maximum width is 180  $\mu$ . The length given by Oudemans is 200-240  $\mu$ . Body oval, not distinctly broadened in its anterior region. Posterior margin of the body strongly sclerotized and with two distinct lateral incisions, as clearly indicated in Oudemans's figure. Dorsal shield strongly sclerotized and carrying a few faint lines, at some places faintly reticulate. The posterior half of this shield bears a median sclerotized structure in the shape of "sugar-tongs". Between the tongs the shield is depressed.

The shield is also depressed at both sides of the tongs and these depressions are limited laterally by a more sclerotized band directed anteriorly and internally. The dorsal shield is 180  $\mu$  long and has a maximum width of approximately 150  $\mu$ . Laterally this shield nearly reaches the setae *l* 2 and *l* 3. Posteriorly the shield extends along the posterior margin of the body to the ventral surface. Epimera I fused in a long and simple sternum (not bifid). Other epimera free. Suctorial plate small, a little wider (50  $\mu$ ) than long (44  $\mu$ ). Anterior suckers very small (8-9  $\mu$  diameter); posterior suckers larger (diameter 18  $\mu$ ). The 4 conoids are situated on a slightly curved line. Legs I-III rather long and thin. Legs IV short, the tarsus wider (8-9  $\mu$ ) than long (7,5  $\mu$ ) and partly fused with the tibia. Pretarsi of legs I-III without projections. Claws I-III small.

Chaetotaxy. The setae *sc i*, *sc e*, *l* 1, *l* 3 and *sh* are 5  $\mu$ , 45  $\mu$ , 35  $\mu$ , 27  $\mu$  and 30  $\mu$  long, respectively. In the paralectotypes, the *l* 2 and the *h* are about 30  $\mu$  long. The *l* 5 setae are situated ventrally. The distance *l* 5-*l* 5 is 28  $\mu$ . Ventral setae thin, slightly thickened in their basal half. Tarsus I-III with 2 rather long foliate hairs. Tarsus IV with one very strong and long apical hair and a short ventral hair (8-9  $\mu$  long). Tarsi I-III with a thin ventro-apical hair and without a posterior preapical lanceolate and curved spine.

Host and locality. On *Koptorthosoma tenuiscapa* Westw. ♀, Java. Coll. J. D. Alfken, Oct. 1900. Lectotype and several paralectotypes.

***Sennertia vanderhammeni* spec. nov.** (figs. 3-4)

*Trichotarsus koptorthosomae* Oudemans, 1901b (in part).

This species is named after Dr. L. van der Hammen, acarologist at the Rijksmuseum van Natuurlijke Historie at Leiden.

The species is distinguished from *S. koptorthosomae* by the following characters:

- (1) posterior margin of the body less sclerotized, more rounded and without distinct incisions;
- (2) suctorial plate more posterior and relatively much broader: maximum width 80  $\mu$ , maximum length 60  $\mu$ ; posterior suckers larger (25-29  $\mu$ ); the conoids much more widely separated from each other;
- (3) the *l* 5 setae not ventral but terminal or subterminal; the distance *l* 5-*l* 5 greater (45-48  $\mu$ );
- (4) dorsal shield less sclerotized.

Hypopus (holotype). Length 255  $\mu$ , maximum width 194  $\mu$ . Dorsal shield 195  $\mu$  long, 165  $\mu$  wide. Length of the dorsal setae: the *sc e*, *l* 1, *l* 2, *l* 3, *h*, and

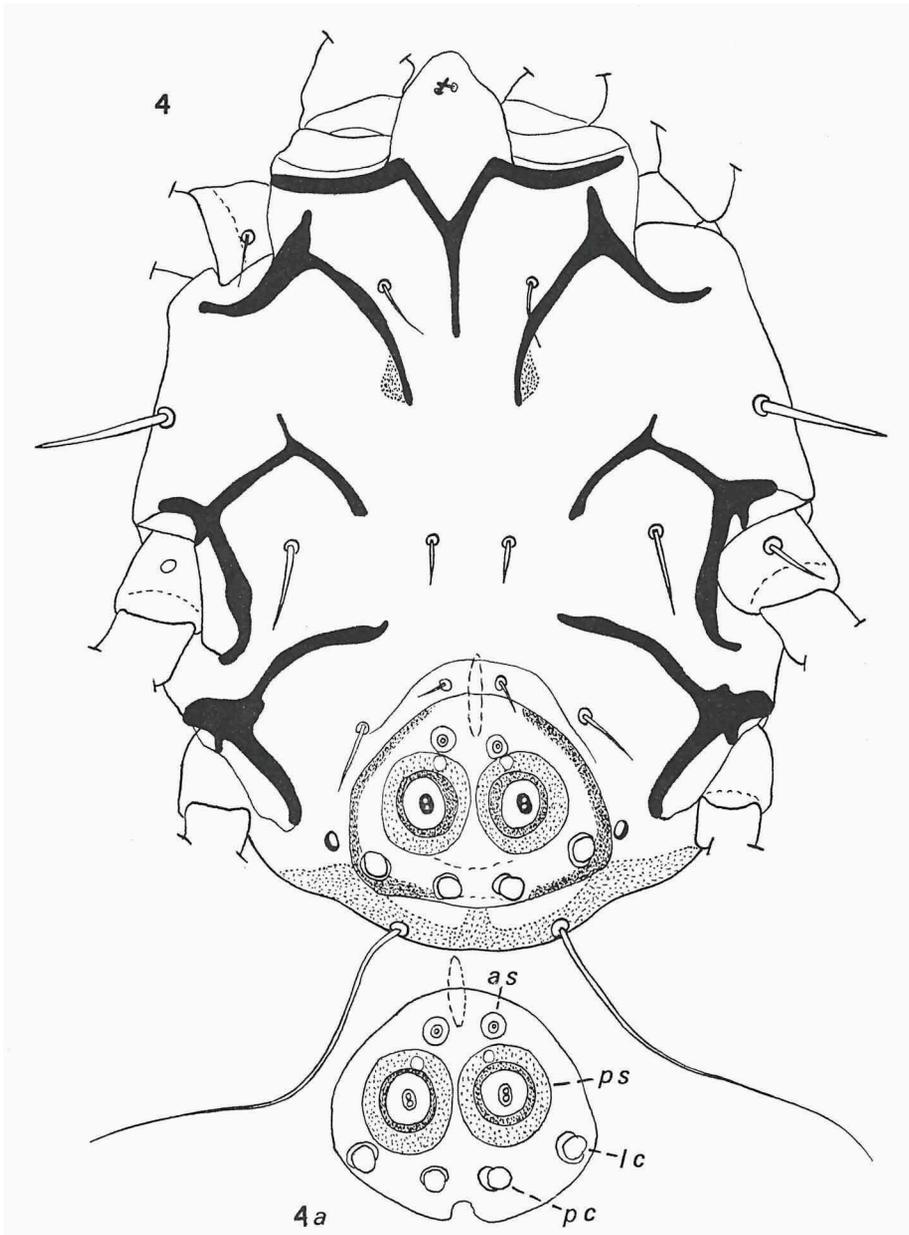


Fig. 4. *Sennertia vanderhammeni* spec. nov., holotype (hypopus), ventral view. Fig. 4a. Organs of the suckorial plate; *as* = anterior suckers, *ps* = posterior suckers, *lc* = lateral conoids, *pc* = paramedian conoids.

*sh* are 60  $\mu$ , 48  $\mu$ , 45  $\mu$ , 51  $\mu$ , 40  $\mu$ , and 41  $\mu$  long, respectively. Dorsal shield as in *S. koptorthosomae* except that the sclerotized structure in "sugar tongs" is incomplete and represented only by its anterior part. Diameter of the posterior suckers: 28  $\mu$ .

Host and locality. On *Koptorthosoma tenuiscapa*. Peradeniya. Ceylon. Coll. E. Green. 02.02.1904. Holotype and 15 paratypes. Holotype and paratypes in the Oudemans Collection. Leiden; 2 paratypes in the collection of the author.

***Sennertia vanderhammeni brevipilis*** subsp. nov.

*Trichotarsus koptorthosomae* Oudemans, 1901b (in part).

This new subspecies differs from the typical form in the following characters:

- (1) dorsal setae shorter: the *sc e*, *l 1*, *l 2*, *l 3*, *h* and *sh* are 33 $\mu$ , 33  $\mu$ , 33  $\mu$ , 30  $\mu$ , 33  $\mu$ , 30  $\mu$  long, respectively;
- (2) posterior suckers slightly smaller (diameter 25  $\mu$ );
- (3) the "sugar-tongs" structure of the dorsal shield complete, as in *S. koptorthosomae*, but narrower than in that species;
- (4) the dorsal shield not extending along the posterior margin of the body and reaching the ventral surface.

Hypopus (holotype). Length 246  $\mu$ , width 186  $\mu$ . Suctorial plate 80  $\mu$  wide and 54  $\mu$  long. The *l 5-l 5* distance is 52  $\mu$ .

Host and locality. On *Koptorthosoma tenuiscapa* Westw. ♀. Java. Oct. 1900. Coll. J. D. Alfken. Holotype and paratypes in the Oudemans Collection, Leiden. These specimens are mixed up with the paralectotypes of *Sennertia koptorthosomae*. The holotype is on slide cat. no. 4. Two paratypes in the collection of the author.

***Sennertia japonicus*** (Oudemans, 1901) (figs. 5-6)

*Trichotarsus japonicus* Oudemans, 1901a: 117, pl. 5 fig. 21.

We have seen the only specimen known of this species.

Hypopus (holotype). Length 230  $\mu$ , maximum width 195  $\mu$ . Body distinctly widened in its anterior half. Dorsal soft cuticle finely striate. Posterior margin rounded. Dorsal shield 175  $\mu$  long and 100  $\mu$  wide (maximum), with lateral margins straight. The setae *l 2* and *l 3* are situated far from the shield. The shield bears a longitudinal median sclerite 75  $\mu$  long. Epimera I fused into a long, non forked, sternum, other epimera free. Suctorial plate 60  $\mu$  long and 71  $\mu$  wide. Anterior suckers small. Posterior suckers 12  $\mu$  wide (=

diameter). Conoids relatively very large, the lateral conoids being distinctly more anterior than the paramedian ones. Legs rather strong. Tarsi I-III with medium sized claws. Pretarsi I-III without projections. Tarsus and tibia IV partly fused. Tarsus IV as long as wide ( $12 \mu$ ).

Chaetotaxy. The setae *sc e*, *l 1*, *l 2*, *l 3*, *h* and *sh* are  $105 \mu$ ,  $75 \mu$ ,  $120 \mu$ ,

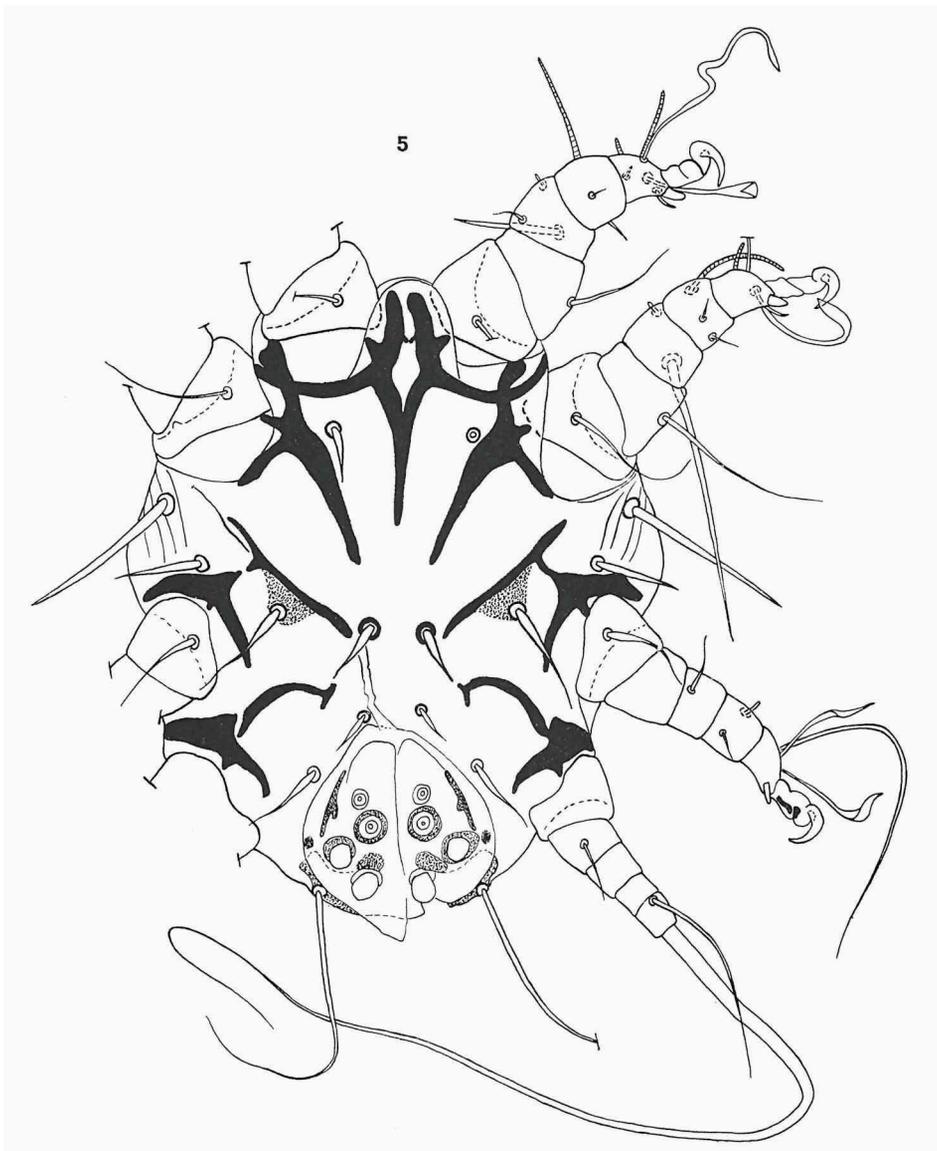


Fig. 5. *Sennertia japonicus* (Oudemans), holotype (hypopus), ventral view.

100  $\mu$ , 66  $\mu$  and 31  $\mu$  long, respectively. Ventral setae strongly inflated at their base, the *cx III* long and very fine apically. The apico-ventral setae of tarsi I-III are spines and are especially thick on tarsi I-II. Posterior pre-apical seta of tarsi I-II in the shape of a strong lanceolate and incurvate seta. Ventral hair of tarsus IV 70  $\mu$  long. Distance *l 5-l 5* is 60  $\mu$ . Genu II with a long (100  $\mu$ ) and strong hair.

Host and locality of the holotype. On *Xylocopa circumvolans* Smith, Kobe, Japan, 21.viii.1891. Coll. J. D. Alfken. The typical slide bears the catalogue number 1.

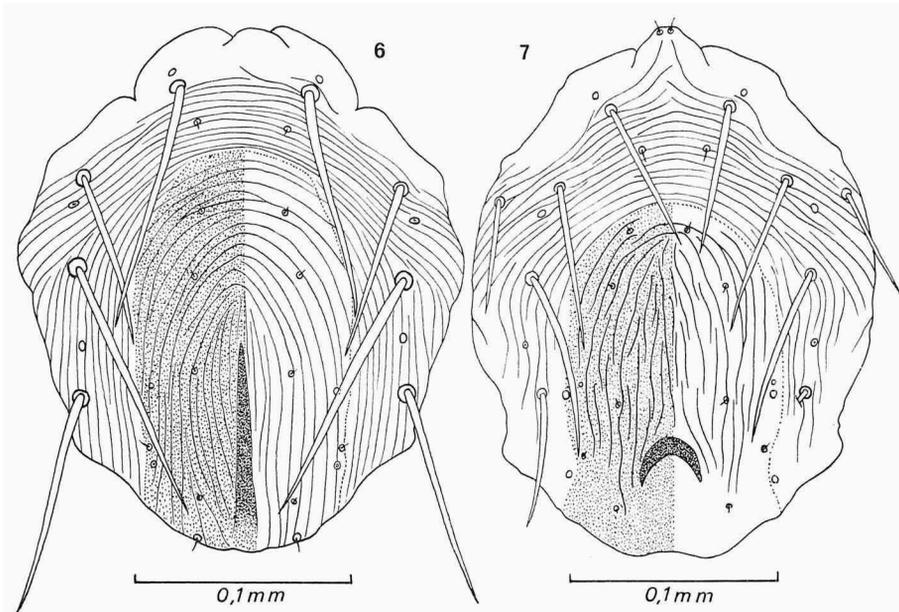


Fig. 6. *Sennertia japonicus* (Oudemans), lectotype (hypopus), dorsal view. Fig. 7. *Sennertia hipposiderus* (Oudemans), lectotype, idem.

### ***Sennertia hipposiderus* (Oudemans, 1902) (figs. 7-8)**

*Trichotarsus hipposiderus* Oudemans, 1902: 44; 1903: 145, pl. 12 figs. 46-47.

We have seen the only specimen (an hypopus) known of this species.

Hypopus (holotype). Length 247  $\mu$ , maximum width 190  $\mu$ . Soft cuticule of the dorsum finely striate. Dorsal shield 165  $\mu$  long and 102  $\mu$  wide (maximum), with lateral margins irregular and distinctly incised in its posterior fifth. The posterior third of this shield bears a sclerite crescentic in shape and 20  $\mu$  long and 30  $\mu$  wide. Posterior margin of the body slightly concave in the midline. Epimera I fused into a simple sternum. Other epimera free. Suctorial plate 35  $\mu$  long and 48  $\mu$  wide. Anterior suckers smaller (9  $\mu$

diameter) than the posterior suckers ( $13\ \mu$ ). The conoids are situated along a line which is very slightly concave anteriorly. Behind the suckorial plate the two strongly sclerotized triangular shields meet in the midline and

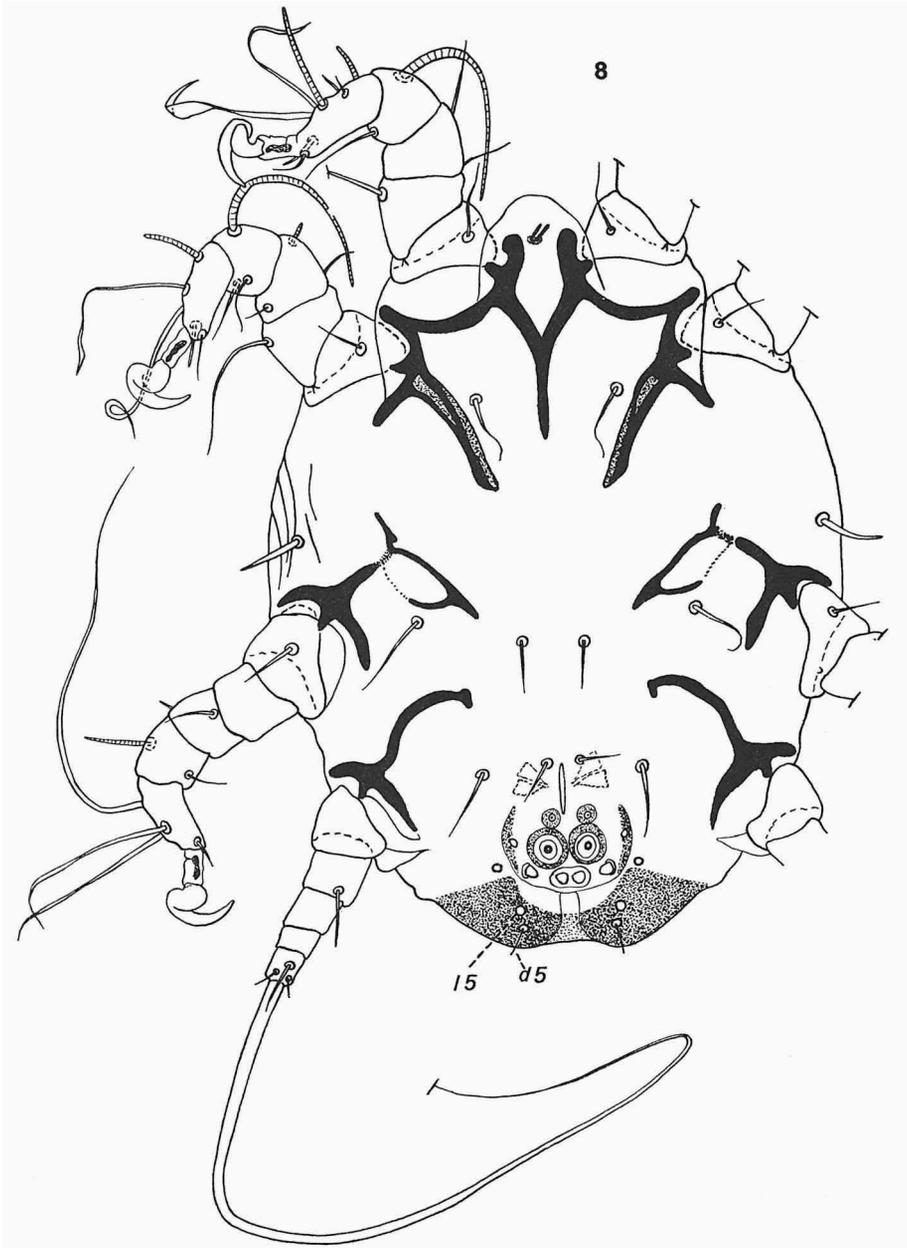


Fig. 8. *Sennertia hipposiderus* (Oudemans), holotype (hypopus), ventral view.

represent prolongations of the dorsal shield. Legs I-III well-developed with medium-sized claws. Pretarsi I-III without projections. Tarsus IV longer ( $12\ \mu$ ) than wide ( $9\ \mu$ ).

Chaetotaxy. The setae *sc e*, *l 1*, *l 2*, *l 3*, *h* and *sh* are  $69\ \mu$ ,  $75\ \mu$ ,  $84\ \mu$ ,  $61\ \mu$ ,  $53\ \mu$  and  $24\ \mu$  long, respectively. Ventral hairs thin. Apico-ventral hairs of tarsi I-III thin. Ventral hair of tarsus IV  $18\ \mu$  long. Tarsi I-II with the subapical and posterior seta thin, not foliate and not curved. Tarsi I-III with 2 long setae, foliate apically.

Host and locality. On *Koptorthosoma tenuiscapa*, India, nov. 1900. Coll. Oudemans. Catal. no. 1. Holotype hypopus.

***Sennertia sumatrensis*** Oudemans, 1924 (figs. 9-10, 13-14)

*Sennertia sumatrensis* Oudemans, 1924: 329.

This species is known only after the hypopial nymphs.

We have seen the typical slide containing the syntypes of this species, and here designate a lectotype.

Oudemans did not give measurements, nor figures of this species.

Hypopus (lectotype). Length  $450\ \mu$ , maximum width  $330\ \mu$ . The size of the body is rather variable in this species. In 5 syntypes the length of the body is  $396\ \mu$ ,  $360\ \mu$ ,  $300\ \mu$ ,  $294\ \mu$  and  $280\ \mu$  long, respectively. Posterior margin rounded. Cuticle of the dorsum finely striate. Dorsal shield  $324\ \mu$  long and  $240\ \mu$  wide at the most. This shield is poorly sclerotized especially

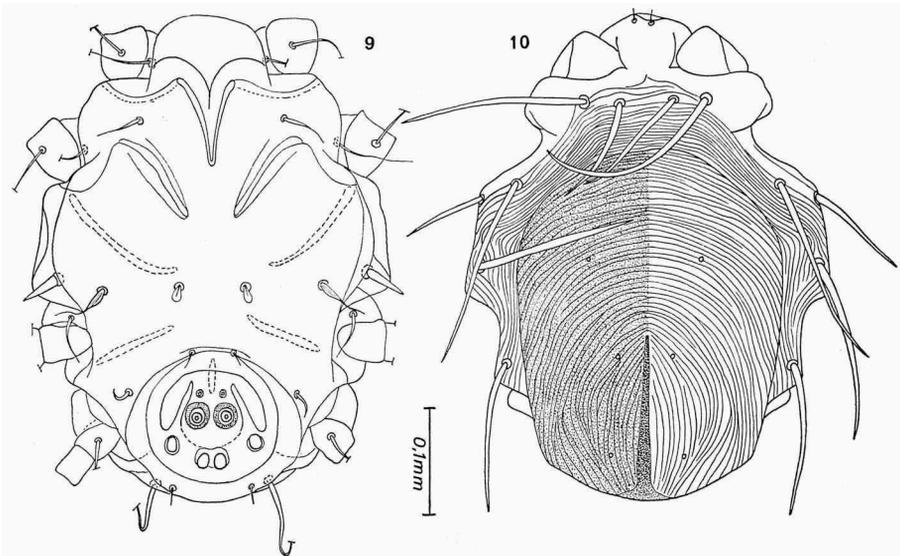


Fig. 9. *Sennertia sumatrensis* Oudemans, lectotype (hypopus), ventral view. Fig. 10. Idem, dorsal view.

in its anterior region, where it becomes difficult to separate from the soft cuticle. Posterior-median sclerite of the shield  $145\ \mu$  long. Epimera very poorly sclerotized. Suctorial plate  $120\ \mu$  long and  $165\ \mu$  wide. Posterior suckers much larger ( $24\text{--}27\ \mu$  diameter) than the anterior ones ( $7.5\ \mu$ ); lateral conoids distinctly more anterior than the paramedian conoids. Legs well-developed; tarsi I-III with a strong claw. Pretarsi I-III with a very small basal projection. Tarsi IV  $35\ \mu$  long and  $18\ \mu$  wide (maximum).

Chaetotaxy. The setae *sc i*, *sc e*, *l 1*, *l 2*, *l 3*, *h* and *sh* are all strong and measure  $105\ \mu$ ,  $171\ \mu$ ,  $170\ \mu$ ,  $175\ \mu$ ,  $139\ \mu$ ,  $96\ \mu$  and  $40\ \mu$ , respectively. The *sc i* and *sc e* are situated on the same line. The *ga* setae are ovoid, the *cx III* are very thick basally and very thin apically. Ventral seta of tarsus IV  $165\ \mu$  long. The distance *l 5*-*l 5* measures  $105\ \mu$ . The apico-ventral hair of tarsi I-III is a short and strong spine. Subapical and posterior hair of tarsi I-II in the shape of a short, slightly curved spine.

Host and locality. On *Xylocopa* sp., Medan, Deli, 1919. Dr. W. Roepke leg. Slide No. 3055. Lectotype and 15 paralectotypes.

**Sennertia alfkeni** (Oudemans, 1901) (figs. 11-12, 15-16)

*Trichotarsus alfkeni* Oudemans, 1901a: 115, pl. 5 figs. 18-20.

We have seen the typical slide of this species, which is known only from the hypopi. It contains 4 syntypes among which we designate a lectotype.

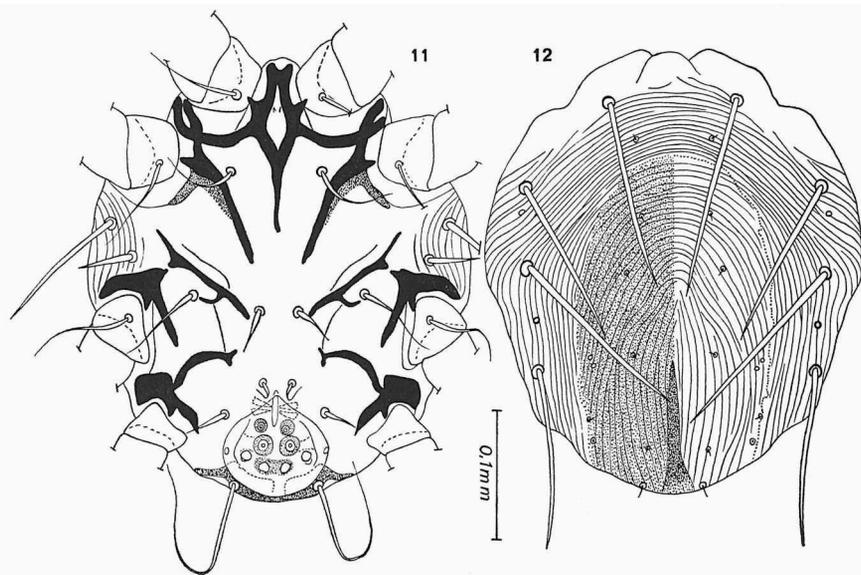
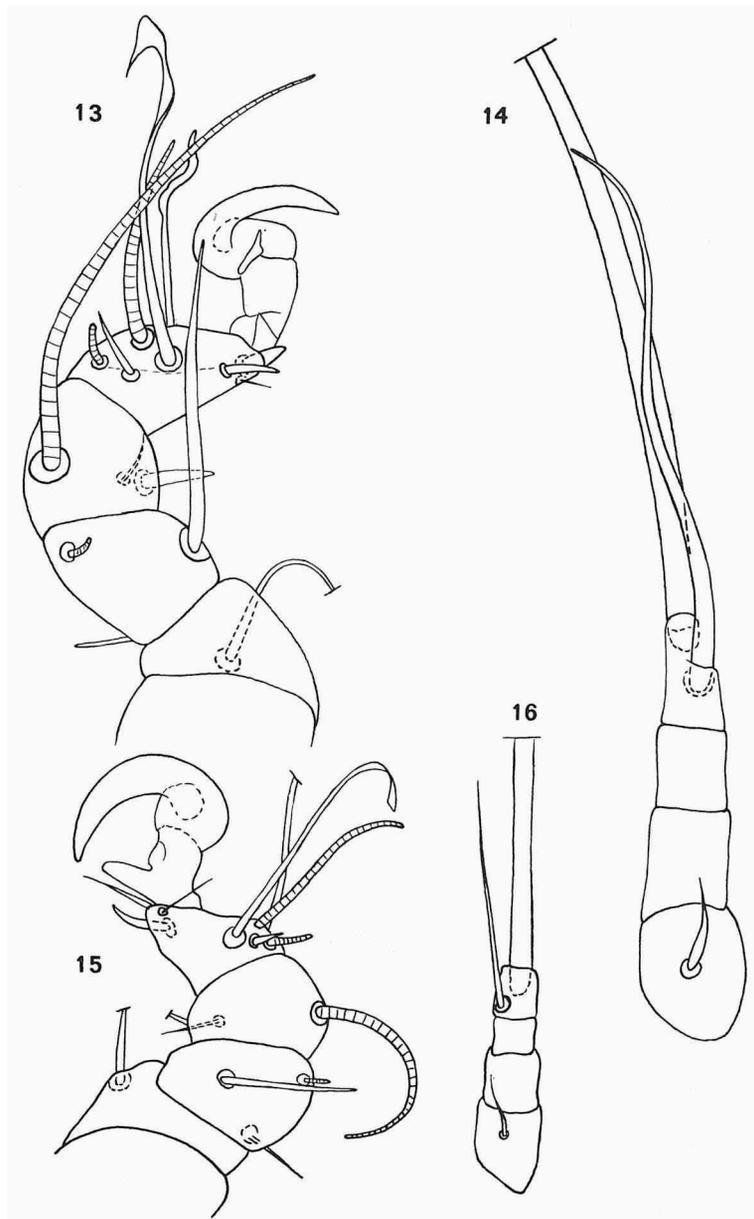


Fig. 11. *Sennertia alfkeni* (Oudemans), hypopus, ventral view. Fig. 12. Idem, dorsal view. (Both drawn after the lectotype and paralectotypes).



Figs. 13-14. *Sennertia sumatrensis* Oudemans, hypopus, legs I and IV.  
Figs. 15-16. *Sennertia alfkeni* (Oudemans), idem.

Hypopus (lectotype). Length 318  $\mu$ , maximum width 270  $\mu$ . Oudemans has given a length of 238-325  $\mu$  and a width of 202-261  $\mu$ . All these specimens are in rather poor condition. Dorsal shield 246  $\mu$  long and 150  $\mu$  wide (maximum), with lateral margins straight and with a postero-median longitudinal sclerite 80  $\mu$  long. Soft cuticle of the dorsum finely striated. Epimera I fused, other epimera free. Suctorial plate 75  $\mu$  long and 80  $\mu$  wide. Anterior suckers very small, posterior suckers 15-16  $\mu$  wide (diameter). Lateral conoids distinctly in front of the paramedian conoids. Legs strong. Legs I-III with large claws and with pretarsi bearing a long and thick basal projection. Tarsi I-II with a strong preapical, posterior, flattened and slightly curved hair. Tarsus IV 18  $\mu$  long and 15  $\mu$  wide.

Chaetotaxy (in lectotype and paralectotypes). The setae *sc e*, *l1*, *l2*, *l3*, *h* and *sh* are 160  $\mu$ , 135  $\mu$ , 152  $\mu$ , 122  $\mu$ , 96  $\mu$  and 33  $\mu$ , respectively. Ventral hairs with bulbous base and very finely attenuated apically. Ventro-apical hairs of tarsi I-III thin with their base slightly inflated. Ventral hair of tarsi IV 81  $\mu$  long (in a paralectotype).

Host and locality. On *Xylocopa circumvolans* Smith, Kobe, Japan, 21.8.1891. J. D. Alfken. Catal. no. 1. Lectotype and 3 paralectotypes.

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