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REVISION OF THE GENERA: *ELTONELLA* AUDY, 1956
AND *MICROTROMBICULA* EWING, 1950,
WITH DESCRIPTIONS OF FIFTY NEW SPECIES
AND TRANSFERAL OF SUBGENUS *CHIROPTELLA*
TO GENUS *LEPTOTROMBIDIUM* (ACARINA, TROMBICULIDAE) ¹

BY

P. H. VERCAMMEN-GRANDJEAN ².

When one considers the whole range of trombiculid mites, the two genera *Eltonella* and *Microtrombicula* are found to be two very homogeneous groups, closely related and involving more than 100 species, and subspecies.

The subgenus *Microtrombicula* (in the genus *Eutrombicula*) was created by EWING, 1950 (32) to accommodate the single species *Microthrombidium minutissimum* Oudemans, 1910 (55), and 1912 (56). FULLER in 1952 (36') redescribed *Trombicula minutissimum* without mentioning Ewing's action. He remarked that: "It is not related to other described species and it probably merits a genus of its own. For the present, however, it is placed provisionally in *Trombicula sens. lat.*." WHARTON and FULLER, 1952 (82) placed this species in their subgenus *Eutrombicula* (genus *Trombicula*), commenting that the species may represent a new genus of the family. Meanwhile a wide range of species was being studied in the Congo and Malaya, and the present writer and AUDY (1954) (8), independently identified a number of other trombiculids congeneric with *T. minutissimum* in 1957. AUDY and VERCAMMEN-GRANDJEAN decided to resurrect the subgenus *Microtrombicula* (genus *Trombicula*) in an interim note which was prepared to support the arrangement of trombiculids in the checklist of Ethiopian Trombiculids contained in the monograph of ZUMPT, 1961 (16). Unfortunately from the point of trombiculid taxonomy Zumpt's checklist came somewhat prematurely, the preparation of the trombiculid section coinciding with the preparation of the tentative scheme of classification or "essai" of VERCAMMEN-GRANDJEAN, 1960 (75). This accounts for several inconsistencies between the trombiculid

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2. Research Parasitologist, G. W. Hooper Foundation, University of California Medical Center, San Francisco 22, California, U. S. A.

Eltonella was raised as a subgenus of Eutrombicula Ewing by Audy, 1956 (II) to accommodate three species: *T. frittsi* Wharton and two new species, *E. (E.) eltoni* and *E. (E.) tweedei, eltoni* having a nymph with paracristal eyes (see Pl. At). At about this time, Audy and Vercammen-Grandjean decided to erect a new subgenus of Eutrombicula to accommodate what Audy has been calling the "lawrencei-group". This was done (subgenus Squamicola) in a paper prepared in undue haste in order to support Zumpt's monograph: Audy and Vercammen-Grandjean, 1961 (17), and to fit in with the publication date of that work. As it happened, Audy had not recognized the closeness of the identity of most of the species in Squamicola to Eltonella itself (i.e., their separation in another subgenus was unjustified), while Vercammen-Grandjean was still establishing his system of classification. It was too late to alter both the paper raising Squamicola and the arrangement in Zumpt's monograph. Accordingly we should here recognize that:

1) Squamicola Audy and Vercammen-Grandjean, 1961, is a synonym of Eltonella Audy, 1956.

2) Eltonella is sufficiently distinct from Eutrombicula sensu stricto to be regarded as a genus, not a subgenus. Vercammen-Grandjean, 1960 (75) divided the genus Eltonella into 4 subgenera.

The subgenus Chiroptella V.-G., 1960 was erected for a group of four species of which two had been seen and studied by the reviser (*insolli* and *revelae*) but unfortunately only one specimen of each species, and these specimens in poor condition. For the two other species (*piercei* and *bandupi*) not available, the identification had to be based on the original descriptions. Those circumstances lead to mistakes and, for instance, the palpopalpsal gross formula, *fT*, stated as 6B was actually 7B.

Thanks to Mr. M. Nadchatram (Kuala Lumpur), who helped efficiently to clarify the situation, the following can be stated:

1) The subgenus Chiroptella is placed under the genus Leptotrombidium,

2) Replacing Chiroptella, a new subgenus, Traubiella, is erected under the genus Eltonella, with the single species multisternalae as type,

3) Chiroptella (7B), Traubiella (6B) and Sasatrombicula (5B) (= Hoffmanniella) having in common the double genualae on leg 3, constitute a chain of very close bat chigger genera,

4) The genus Chiroptella is an important link, on one side between Eltonella and Leptotrombidium, on another side between Myotrombicula and Leptotrombidium.
I. — GENERAL TAXONOMIC CONSIDERATIONS

A. — Larvae.

I. — Classification.

The three genera *Eutrombicula*, *Eltonella* and *Microtrombicula* are related in the general morphology of the larvae and particularly in the peculiar shape of the scuta which have more or less pronounced anterolateral “shoulders”. *Eutrombicula* is readily separated from the other two genera by the palpotarsal setae, the gross formulae ($f_T$) being *Eutrombicula* $f_T = 7B.S$; *Eltonella* and *Microtrombicula* $f_T = 6B$. On the other hand, while the palpal claws of *Eltonella* are 3-pronged, those of *Eutrombicula* and *Microtrombicula* are always 2-pronged.

I. Genus *Eltonella* Audy, 1956 (11).

*Diagnosis*: Trombiculini possessing a punctate scutum having anterior “shoulders” with a peculiar backward position of the two antero-lateral setae; palpotarsal gross formula, $f_T = 6B$; palpal claws three-pronged; the two galeal setae are nude.

*Type species*: *Eutrombicula (Eltonella) eltoni* Audy, 1956 (11).

The genus *Eltonella* is here divided into four subgenera, of which *Eltonella* s. str is the most numerous: 37 species.

A — Subgenus *Traubiella* nov. 1.

*Diagnosis*: *Eltonella* with a typical scutum, sensillae branched on the distal half; eyes present; three genualae on leg 1, two on leg 3, no mastitarsala. Bat parasites.

*Type species*: *Eutrombicula (Chiroptella) multisternalae* V.-G., 1963 (76), comb. nov.

B — Subgenus *Coecicula* V.-G., 1960 (75).

*Diagnosis*: *Eltonella* possessing a typical scutum, pentagonal in shape, with two trifurcate sensillae; no eyes (blind species, reason for the name “*Coecicula*”); only one genuala on third leg; no mastitarsala 3.

*Type species*: *Trombicula mastomyia* Radford, 1942 (59).

1. Named after Dr. R. Traub; this following the suggestion of Mr. M. Nadchatram to whom I want to express here my deepest thanks for his friendly and generous intervention.
C — Subgenus *Eltonella*, Audy, 1956 (11).

*Diagnosis*: *Eltonella* having a scutum roughly pentagonal and sensillae with numerous branches; only one genuala on leg 3; paired eyes always present; one mastitarsala on leg 3.

*Type species*: *Eutrombicula (Eltonella) eltoni* Audy, 1956 (11).

D — Subgenus *Marcandrea* V.-G., 1960 (74).

*Diagnosis*: *Eltonella* having a scutum roughly trapezoidal in shape, with branched sensillae; no eyes (blind species); two genualae on leg 3; a fairly long tarsala (striated spur or solenidion); no mastitarsalae.

*Type species*: *Microtrombicula (Marcandrea) fromonti* V.-G., 1960 (74).

II. Genus *Microtrombicula* Ewing, 1950 (33).

*Diagnosis*: *Trombiculini* having a pentagonal shaped scutum with anterior "shoulders" and backwarded antero-lateral setae; its sensillae either branched or flagelliform; palpotarsal gross formula: \(fT = 6B\), palpal claws two-pronged; always oculate and provided with one mastitarsala 3 and a single genuala 3.

*Type species*: *Microthrombidium minutissimum* Oudemans, 1910 (55).

The genus *Microtrombicula* is divided into two subgenera, *Microtrombicula* s. str. being the greater in number. The subgenus *Scapuscutala* is somewhat less homogenous.

A — Subgenus *Microtrombicula* Ewing, 1960 (33).

*Diagnosis*: *Microtrombicula* having a peculiar subpentagonal scutum, rather small, verruco- or reticulo-punctate, usually bearing bifurcate or flagelliform sensillae; two galeal setae always bare.

*Type species*: *Microthrombidium minutissimum* Oudemans, 1910 (55).

B — Subgenus *Scapuscutala* V.-G., 1960 (75).

*Diagnosis*: *Microtrombicula* having a punctate scutum, with branched sensillae.

*Type species*: *Trombicula crossleyi* Loomis, 1954 (48).

— 37 —

2 — Value of some taxonomical characters.

In each subgenus, certain peculiar secondary characters lead to a last tentative species grouping. For instance, *Eltonella* sg. is split into three groups:
1) gr. eltoni : with a scutum possessing a pointed posterior edge,
2) gr. rossi : with a rounded postero-scotal edge,
3) gr. gerrhosauri : an ecological grouping, closely related to some species belonging to the subgenus Scapuscutala, and perhaps also related to certain Eutrombicula.

In the same manner Microtrombicula sg. is divided into two groups:
1) gr. verrucascuta : with flagelliform sensillae;
2) gr. minutissima : with bifurcate, trifurcate or (rarely) branched sensilla.

a. Scutum.

The shape of the scutum is important; also the presence of eyes.
1) Traubiella : (Pl. A, 5) typical "eltonella" scutum, clearly punctate, AM fairly longer than ALs and PLs. Eyes present.
2) Coecicula : (Pl. B & HH) scutum pentagonal, with trifurcate sensillae. Eyes absent.
3) Eltonella : (Pl. C-Z & AA-HH) scutum more or less pentagonal, with barbed sensillae. Eyes present.
4) Marcandrea : (Pl. B) scutum trapezoidal, no caudal backward position of the sensillary base lines. Eyes absent.
5) Microtrombicula : (Pl. JJ-ZZ & AB-AS) small scutum subpentagonal, typically verrucose or reticulated. Eyes present.
6) Scapuscutala : (Pl. FF-KK) punctate scutum shaped like those of Eltonella. Eyes present.

The five hairs or barbed setae (r AM, 2 AL and 2 PL) inserted on the scutum, are also of certain importance, the following length ratio is current: PL > AM > AL or AM > PL > AL; exceptions being: AL > PL (for Eltonella gerrhosauri, Scapuscutala maura and S. meridialis).

The sensillae may be branched, furcated or flagelliform. Flagelliform sensilla is the rule in the verrucascuta-gr; bifurcated sensilla is the rule in the minutissima-gr; but certain sensillae are trifurcated, such as in katangae, bukamae, nasalis and paralumsdeni, or branched as in ornata and wrenni. Too, the apparently bare sensilla stalk is often clothed with some very short and thin barbs.

The scutal surface, as already said, may be punctate or verruco-punctate. The punctation may be sparsely scattered or dense, the pits constituting that punctation may be large or very small in diameter. When they are large and numerous, their joining gives to the scutum surface a verrucose or reticulated appearance. This is a peculiarity of most of the species belonging to the Microtrombicula subgenus. The reticulation is much reduced in hexasternalis and non-existent in armata and merrihewi. The punctations of Traubiella are large; those of Coecicula and Marcandrea are small and very numerous; while Eltonella exhibits
a much more scattered pattern. In the *Eltonella* sg., the *gerrhosauri*-group has a very meager punctation.

b. *Gnathosoma*.

Its general appearance is close to the normal gnathosoma of most of the Trombiculidae. The palpo-tarsal gross formula is uniformly : \( fT = 6B \). The palpotibial claw remains a fundamental character depending on the number of its terminal prongs : 2 or 3. Nevertheless, the rule, which entails two-pronged palpal claws for the *Microtrombicula* and three-pronged claws for *Eltonella*, is not always present. For example, *Microtrombicula major*, a typical *Microtrombicula* of the *verrucascuta* group, possesses three-pronged claws instead of two-pronged. Illustrating the contrary case : *fieldi, maura* and *meridialis* are much closer to *Eltonella*, being related to Lawrence’s *gerrhosauri* group, than *Microtrombicula*, in spite of their two-pronged palpal claws. Therefore, their systematic position in the subgenus *Scapuscutala* may be considered only as a provisional one.

In certain cases, the palpal claws are stronger than is usual; *M. (M.) merrihewi* is an impressive example, *M. intranasalis*, a more recent discovery, is another.

The two galeal setae are generally bare, but are branched in four *Scapuscutala* : *crosseleyi, maura, meridialis* and *villiersi*.

The palpo-tarsal gross formula, as already stated, is \( fT = 6B \). In the past, some ‘ \( fT \) ’ were designated as 5B.S, but that ‘ S ’, which is a nude seta, is not a true “ *Subterminala* ”. In fact the nude setae, sometimes present on the palpal tarsus, are usually hairs deprived of barbs. One way to designate them in the formula could be : \( fT = 5B.N \), or 4B.2N, or 3B.3N... but this would lead to confusion, and is not recommended. Also it is better to consider those bare hairs as barbed, because of the similarity of their origin. The phenomenon of barb reduction on the palpo-tarsal setae accompanies a similar reduction of bars on the dorsal leg setae (pseudomastifemoralae, pseudo-mastigenualae, pseudo-mastitibialae and pseudo-mastitarsalae).

The palpal setulation formula is as follows :

1) *Chiroptella* : (N)-(N)-(N).N.N.

2) *Traubiella* : (B)-(B)-(N).N.B.

3) *Coecicula* : (B)-(B)-(N).N.B or (B)-(B)-(N).B.B.

4) *Eltonella* : (B)-(B)-(N).N.B or (B)-(B)-(B).B.B with any combination of these two formulae : *eltoni* gr. and *rossi* gr.

5) *Marcuscrea* : (B)-(B)-(B).B.B.

6) *Microtrombicula* and *Scapuscutala* : any kind of combination of N and B setae. The chelicera ordinarily has a strong base and a well-developed blade. The blade is provided with the usual tricuspid cap and subterminal butting-tooth which may, at times, be modified into a true tooth or hook, as in : *armata, irragiensis, merrihewi, tamisci* and *paraxeri*. 
c. Legs.

The sternal hair formula is commonly: $fSt = 2.2^1$.

But in certain cases, we may find: $fSt = 2.4$, as in *maura* and *meridialis*, or $fSt = 2.2.2$ as in *crossleyi*, *trisetica* and *hexasternalis*.

The coxal hairs also have a very usual formula $fCx = 1.1.1$, and the three exceptions recorded, are: *M.* (S) *trisetica*, $fCx = 1.1.3$, *M.* (S) *rajoriensis*, $fCx = 1.1.2$, and *M.* (S) *crossleyi*, $fCx = 1.1.5$ (Sometimes 4 or 6).

Coxal and sternal setae always display the same pattern or appearance, a fact that only a common origin can explain; they are definitely different from the other body setae. In the subgenus *Microtrombicula*, they assume — because of their diversity — taxonomic importance.

Sometimes, the coxal and sternal formulae are done as follows:

$$fCx = B_4 \cdot N \cdot B_3 \text{ and } fSt = 2N^* \cdot 2N$$

It denotes that the anterior coxal setae is provided with four long branches, the middle coxal hair is nude, and the third has five long branches, that the two anterior sternal hairs are nude but possess two or three short basal barbs (sometimes barely visible!), while the posterior sternal setae are completely bare.

**Trochanter**: this typically curved segment bares always a single fairly long hair, which is usually barbed, sometimes even plumose, or rarely nude as in *resseleri* (Pl. AC).

**Femur**: This segment is nearly always divided into two articles: basi-and telo-femur. But in certain species we may find undivided or partially divided (semi-division) femurs; this lack of division does not affect necessarily the femur of each pair of legs.

As a consequence, the leg segmentation formula, while $fsp = 7.7.7$ for all the *Eltonella* and *Scapuscutala*, may show different combinations for many *Microtrombicula* : $fsp = \text{from } 6.6.6 \text{ to } 7.7.7$; (passing through all the possible combinations, including $6!6!6!$ (in which $6!$ means a semi-divided femur.)

As is well known, each leg bears a certain number of special setae or 'organels' all located on the dorsal surface of the various segments. Only the 'Pretarsalae' 1 and 2 (PT' and PT") are located on the ventro-external edge of the first and second tarsi, near the small pretarsus supporting the two claws and the median empodium. At quite an opposite position (dorso-internal curve of tarsus 1) is found the strong and straight pointed 'Subterminala' and its small companion, the slender 'Parasubterminala' : ST and $\rho ST$.

The presence or absence of the pretarsala, the subterminala, and the parasubterminala is here referred to by the abbreviation followed by the sign + or —.

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1. The coxae constitute part of the legs, their setae are sometimes very peculiar. Considering the fact that sternal setae always follow the coxal hairs in their peculiarities, it seems logical to place them under the same common study title: Legs.
For an example, the four species *nasalis, merrihewi, ornata* and *wrenni* would show: $PT' = +, PT'' = -, ST = +$ and $pST = +$. They are the only known species having no pretarsala 2.

**Genu**: Leg 1: generally we find two or three genualae and a small microspur (Famulus). For certain species the genuala number constitutes a true taxonomic character. But for some other species this is not the case and moreover there is a definite inconsistency in the character with, at times on the same specimen, one genu having 2 and the other 3 genualae.

Leg 2: always bears a single genuala, never a microgenuala (Famulus).

Leg 3: most trombiculid mites have only one genuala 3, but a few of them, are characterized by the presence of two genualae 3 as in *Sasatrombicula, Chi­roptella, Traubiella* and *Marcandrea*, (only the last two being of any interest in the present work).

**Tibia**: On leg 1, we find two solenidions, both more or less striated, and a microspur (Famulus).

On leg 2, same kind of solenidion, but no microspur is to be found.

On tibia of leg 3 there is always a single nude tibiala, very similar to genuala 3.

**Tarsus**: On leg 1, is always found a strong straight seta, the ‘Subterminala’ and its slender companion, the ‘Parasubterminala’. On both legs 1 and 2, there is usually a ‘Pretarsala’ exception made for *merrihewi, nasalis, ornata, and wrenni*, where $PT''$ lacks. Finally, one solenidion (= striated spur) is present, preceded (leg 1) or followed (leg 2) by a microspur (Famulus). The tarsala 1 (or solenidion 1) is very long in *Marcandrea* (Pl. B) and also in some *Microtrombicula* parasitizing bats (*nycteris* and *irangiensis*). In certain species, the apex of the solenidion 2 may be somewhat inflated (*gerrhosauri, maura, meridialis, pachydac­tyla* and *audyi*). *Eltonella* sg. and *Microtrombicula* g. always have one mastitar­sala on leg 3; *Traubiella, Coecicula* and *Marcandrea* never do.

**Claws**: (and claw-like empodium), always present at the end of each leg, never show any important differences in their morphology.

**Leg Index**: As we have known for a long time, it shows little to express the size of a chigger-mite in terms of its body-length and width. First because, usually the third dimension (body-height) is not taken. In such a case, the dimensions do not mean very much. Furthermore, it is well known that the tendency of the body is to swell up continuously, so that its three dimensions are inconstant and consequently, totally valueless. It seems much more objective to express the relative size of a trombiculid in terms of its leg lengths. Since the legs are almost completely sclerotized, the measurement of their lengths gives a much more constant figure. This led us to sum up the lengths of the three legs to give a single number, easier to remember, more intuitive and expressive, and useful for quick comparison.

Applying that principal:
1) *Traubiella* : 1 240 μ, large sized mites.

2) *Coecicula* : 580 to 750 μ, small to medium sized mites, the mean showing a rather small size.

3) *Eltonella* : 540 to 900 μ, small to medium sized mites, but most being between 600 and 700 μ; small size.

4) *Marcandrea* : 620 to 720 μ, small size.

5) *Microtrombicula* : 430 to 880 μ, very small to medium sized, the average being rather small.

6) *Scapuscutala* : 480 to 1 010, very small to medium sized (extreme limit).

As a general conclusion, *Eltonella* and *Microtrombicula*, are almost always small mites.

d. *Body* or *Idiosoma*.

The body shape, in itself, is of real importance in systematics as a rough naked-eye diagnosis, as are the body’s yellowish to orange color and its two reddish eye-spots. By using a good stereoscopic magnifier with properly balanced light, one is able to recognize the more or less hairy nature of the idiosoma and the appearance of the scutum, its setae and sensillae (expanded or not). This on a living mite (*in situ*) on its preanesthetized host. This method, requiring a short training period, is of great importance in ecological studies.

The body setation is of capital taxonomical importance, in regard to the appearance of the various setae, their number and their arrangement on the body (NDV, fD, fV). Also important is the relative position of the anal pore or “uro-pore” (u). In the subgenus *Microtrombicula*, more than in other subgenera, the appearance of the humeral (H), dorsal (D), pygidial (P), ventral (V), coxal (Cx or C), sternal (St or S), and scutal setae (AM, AL, PL) have an exceptional importance. Especially the coxal and sternal setae, which range from nude through a more or less branched appearance (see c. *Legs*), to coarsely barbed.

B. — *Nymph*.

All of those nymphs have in common the palpo-tarsal gross formula:
\[ fT_n = 9B.3S \]
which corresponds to the larval formula: \( fT_1 = 6B \).
The other characters are classical, so their study will be treated individually.

C. — Ecological considerations.

1) Location: Most of the species of the two genera Eltonella and Microtrombicula appear to be tropical or subtropical mites, as shown in the following list (Loc).

2) Host: The preferred hosts are rodents, but a large number of the subgenus Microtrombicula and the subgenus Traubiella are bat parasites. Some old world tropical Eltonella are purely reptile parasites, while in Equatorial Africa they are mammal parasites. The Central African Coecicula were found on rodents, whereas the American members of that subgenus were found on bats. Very few of the two genera — about ten species — feed on birds. One Marcandrea and one Eltonella s. str. are recorded from arthropods. Finally, one species, E. celiae, was found free-living as a termitary dweller in the company of an adult trombiculid to be described under the name of Tenotrombicula minteri (87).

3) Parasitope: The parasitic location of most of the Eltonella is the ears of their host. Many other are found on the skin (never in the skin), on the belly, in the groin, or in the armpit; rarely are they found on the eyelid or on the snout.

Members of the genus Microtrombicula are also typical ear-dwellers, very often aggregated in large colonies in a very restricted area. Some Microtrombicula of recent discovery were found in the nasal passage of mammals: *intranasalis*, *nasalis* and *wrenni*, the former from Central Africa, the other two from the U.S.A.

D — List of species belonging to the genera **ELTONELLA** and **MICROTROMBICULA**; and of the subgenus **CHIROPTELLA** transfered to the genus **LEPTOTROMBIDIUM**.

I. — **Leptotrombidium** Nagayo et al., 1966; genus, p. 50.

*Chiroptella* V.-G., 1960; subgenus comb. nov. (type: *insolli* Phil. & Tr., 1950), p. 50.

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### Microtrombicula Ewing, 1950; genus
(type: minutissima Oudemans, 1910), p. 84.

#### A — *Microtrombicula* Ewing, 1950; subgenus (type: minutissima), p. 84.

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III. — *Microtrombicula* Ewing, 1950; genus
(type : minutissima Oudemans, 1910), p. 84.

---
49 youhensis, Tr.; Abonnenc & Taufflieb, 1947  
50 zumpti, Mtr. (Mtr.); V.-G., 1950  

S Ew M  5 89 RR  
U Es M  45 112 ZZ  


51 crossleyi, Tr.; Loomis, 1954  
52 fieldi, Eutr.; Audy, 1956  
53 khurdangensis, Tr.; Womersley, 1952  
54 maura, Eutr.; Taufflieb, 1960  
55 meridialis, Eutr.; Taufflieb, 1960  
56 munda, Tr.; Gater, 1932  
57 nadchatrami, Mtr. (Scap.); V.-G., 1960  
58 rajoriensis, Tr.; Womersley, 1952  
59 rhoptropi, Eutr.; Lawrence, 1949  
60 spicea, Tr.; Gater, 1932  
61 trisetica, Tr.; Loomis & Crossley, 1953  
62 villiersi, Mtr. (Scap.); V.-G., 1960  

Addenda.  

After this revision was completed, I had the opportunity to study the following species, which I now realize should have been included.

I. — Leptotrombidium Nagayo et al., 1916; genus, p. 50.

A — Chiroptella V.-G., 1960; subgenus comb. nov. (type: insolli Phil. & Tr., 1950, p. 50.

After Loc. Host
1' giga, Tr.; Schlüger et al., 1959 D Ps Mch
2' niehoffi, Tr.; Domrow, 1962 D Om Mch


D — Eltonella Audy, 1956; subgenus (type: eltoni Audy, 1956, p. 58.

27' merga, Tr.; Brennan & Jones, 1960 S Ntc B
41' shannoni, Tr.; Ewing, 1929 S Ntc M, Mch
44' sternalis, Tr.; Brennan & Jones, 1961 S Ntc Mr


A — Microtrombicula Ewing, 1950; subgenus (type: minutissima Oudemans, 1910), p. 84.

Some of these species will be more fully described and illustrated in forthcoming issues of Acarologia.
II. - RÉVISION

A. - Acknowledgment.

The present revision, 1) will not follow the alphabetical order of the preceding
checklist; rather the species will be studied in such order as to take care of their
individual relationships and affinities;
2) will report the essential data of each species, as it
appears on our identification cards.

To clarify the second point, an explanatory example is given here for "Larva"
and "Nymph" of *Microtrombicula verrucascuta* n. sp.

I. - Larva:

*Microtrombicula (Microtrombicula) verrucascuta* n. sp. [grp. T.]. Cl. n° 46.

a - Host: Mr: *Lophuromys aquilus, Dasymys bentleyae.*

PT: ears (auditory duct).

Loc.: Bukavu and Mushwere (Rep. of Congo, Kivu Province).

Date: 12 Feb. 1954.

Type material: Holotype in the Musée d'Afrique Centrale, Tervuren (Belgium).

b - Pl. AH and YY, 5, 6 & 7.

c - SIF = 6B.N.2.3111.100  \( fPBP = (B)-(B)-(N).B_1.B \)

\( ST = +, \rho ST = +, PT' = +, PT'' = + \)

\( fSP = 7.6.6 \quad fCx = B_4.N.B_3 \quad fSt = 2B_4.2B_1 \)

\( fD = 2H + 6.6.6.6.4.2 = 32 \quad fV = 6.6.4.4.6.6.2.2 = 36 \quad NDV = 68 \)

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip

26 33 12 20 17 37 22 16 16 22 17 28 25/20 15/20 154 125 145 424

(N.B.: All the measurements are expressed in micra for the nymphs as well
as for the larvae.)

Obs.: Very small species, differs from *kawaensis* in having its dorsal setae devoid
of insertion shield; from *lophuromyia* in the nature of its setae (see *Cx_1*, *Cx_3*,
and *St_1*); and from both in having only 6 setae on the first dorsal row, instead
of 8.

Explanations: The present name of the species is followed by the number
in the preceding alphabetical check-list: Cl. n° 46; and — occasionally — by the
qualification of type-species of: genus = T, subgenus = Ts, or group = grp.T.

Under the name are the synonyms, if any, and the references.

a - *Ecological data including:* names of hosts, parasitope or location on host,
locality of host, date of capture, location of the type-material.
b — *Illustration records* : (Plates and fig.).

c — *Identification data* : SIF = Synthetic Identification Formula : including the $fT = 6B$ ; the nature (bare or branched) of the two galeal setae ; $Ga = N$ ; the number of prongs of the two palpo-tibial claws : $Gr = 2$ ; the number of genualae $r$, 2, and 3 and of Tibialae $3 : ga = 3$, $gm = r$, $gp = r$ and $tp = r$ ; finally the number of mastitarsalae, mastitibialae, and mastifemoralae $3 : MT = r$, $Mt = o$, $MF = o$.

$fPp$ = palpal setation formula, indicating the nature, nude or barbed, of the femoral and genual single setae, and of the three tibial setae ; each dash separating two segments, and parenthesis denoting a dorsal position on the palpus.

$ST, pST, PT'$ & PT" = subterminala, parasubterminala, pretarsala $r$ and pretarsala $2$ ; + or − (= present or absent).

These data and the three following ($fsp$, $fCx$ and $fSt$), will usually be reported only under generic and subgeneric descriptions.

$fsp$ = leg segmentation formula (coxae included) ; 7 = seven segments, femur divided into basi- and telo-femur ; 6 = six articles, femur undivided ; 6! = six segments, but femur only partly divided (semi-division).

$fCx$ & $fSt$ = coxal and sternal setation formulae ; B subtended by a number indicates a branched seta with that number of long branches, $N = nude$, $N'$ or $N" = nude$, but having sometimes $1$ to $3$ barely perceptible basal barbs.

$fD$ & $fV$ = dorsal and ventral body setae formulae ; $u$ indicates the uropore location.

NDV = total number of body setae.

Then follow the measurements in micra for which the abbreviations currently known are : $pa$, $pm$ & $pp$ = lengths of anterior, median, and posterior legs ; $Ip$ = leg-index, or sum of the three preceding lengths.

*Obs.* : Short record concerning characters having some importance in the differential diagnosis.

II. — **Nymph** :

*Microtrombicula (Microtrombicula) verrucascuta* n. sp.

a — Host : *Lophuromys aquilus*.

Loc. : Bukavu.

Larval Date : 12 Feb. 1954.


b — Pl. AI, 1 & 2.

c — $fTn = 9B.3S$ ASL/SB = 1,8 PGC : 2 PGS : 1 Hyp × 4N $fSt = 4B$ to $6B$ Sens : SP = 53 (short thin barbs), $SA = 55$ (16B, of 13 μ).
CL = 35   CA = 18   BL = 88   BH = 32   pCS = 9 to 12 (on each side of the Crista).

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Obs. : Very small species.

Explanations :

a — Name and ecological data as for the larva. Emerg. Date = date of emergence of the young nymph, after its period of pupation, starting with the larva date.

b — Illustration records.

c — Identification data : still very poor for nymphs.

fTn = palpo-tarsal gross formula using the signs similar to those of the larva : 9B.3S (corresponds to a larva having a fT = 6B.) The ratio ASL/SB may at times prove very useful from a taxonomic view point.

PGC & PGS = paraglyphic ctenidia (comb) or spines and paraglypic seta ; the former dorsal and generally two in number, the latter ventral and usually single, straight, long and nude.

Hyp. = the two apical lobes of the hypostome, each bearing nude setae generally four in number.

fSt = number of setae on the sternal shield.

Sens. = sensilla : SP = length of its pedunculate basal part, and SA = the length of its apical branched part. SP = 53 and SA = 55 (SA bears 16 slender branches being about 13 μ each.)

CL and CA = Cheliceral blade length and articulation height.

BL and BH = Length and Height of the chelobase.

pCS = paracristal setae, 7 to 10, on each side of the crista-metopica.

Then follow the standard measurements :

ASL, PSL, and CTL = distance from tectal-seta base to sensillary base line, from sensillary base line to the end of the posterior sclerite, and total length of the crista-metopica (from the anterior edge of the tectal denticulate fringe to the pointed end of the posterior sclerite).

S & SB = length of the sensilla and distance between the two sensillary bases.

T = length of the tectal barbed seta.

IL = body length.

PW, OW, CW = propodosoma, opisthosoma, and constriction width.

P1, P2, P3 & P4 = length of the four legs (coxae included, claws excluded).

IPn = leg-index, sum of the four leg lengths.

D = length of the dorsal hairs, on propodosoma and caudal edge.
TL, TH and tL = first leg-tarsus length and height, and first leg-tibia length.
N. B. : The plates AC to AS date from 1955!

B. — Description.

I. — Genus Leptotrombidium Nagayo et al., 1916.

= Eltonella (Chiroptella) V.-G., 1960 (75) in part.
= Trombicula, Ewing, 1931 (29), Philip & Traub, 1950 (57), Audy, 1952 (7),
  Hiregaudar & Bal, 1956 (40), Gunther, 1952 (39), Radford, 1954 (64).
= Trombicula (Trombicula), Thor & Willmann, 1947 (72), Wharton & Fuller, 1952
  (82), Womersley & Audy, 1957 (85).

a — Host : Mch.
   PT : Ears, skin of belly, armpit and wings.
   Loc. : Tropical regions, Asia and Central america.

b — Pl. A, 1 to 4 and 6.

c — SIF = 7B.N.3.2121.00°
ST = +
PT = +
PT* = +
Ip = 640 — 1 000
fPp = (N)-(N)-(N).N.N
fsp = 7.7.7
fCx = B.B.B
fSt = 2B.2B.

Obs. : Scutum abundantly punctate, with anterior shoulders and with sensilla
base line very near the PLs’line and the posterior margin ; PL>AM ; paired eyes.
Palpal setae all nude on femur genu and tibia. Two genualae on legs 1 and 3.
No mastitarsala, one mastifemorala.

1. Leptotrombidium (Chiroptella) insolli (Philip & Traub, 1950) [Ts]. Cl. n° 2.

= Trombicula insolli Philip & Traub, 1950 (57), Womersley, 1952 (84), Audy, 1952
  (7), Gunther, 1952 (39), Radford, 1954 (64).
= Trombicula (Trombicula) insolli, Wharton & Fuller, 1952 (82), Audy, 1954 (9),
  Womersley & Audy, 1957 (85).
= Eltonella (Chiroptella) insolli, (Philip & Traub, 1950), V.-G., 1960 (75).

a — Host : Mch : Eonycteris spelea — n° 8011.
   PT : ?
   Loc. : Batu Caves, Kuala Lumpur, Malaya : Om.
   Date : 20 March, 1948.
   Type material : Holotype at the U.S. Nat. Mus. (n° 1865).


= *Trombicula bandupi* Hiregaudar & Bal, 1956 (40).

a — Host: Mch: *Rhinolophus rouxi*.

PT: ?

Loc.: Tulsi Lake tunnel, Bandup, Bombay India: Oi.

Date: 20 October 1955.

Type material: Holotype at the Dept. of Parasitology, Bombay Vet. Coll., India.

b — Pl. A, 2.

c — SIF = 7B.N.3.2121.001 (?) fPp = (N)-(N)-(N).N.N.

fD = 2H + 8.6.8.6.4.2 = 42 fV = 4.6.4.8.8.4.2. = 40

NDV = 42 + 38 = 80.

Obs.: differs from the other species in its dimensions.


a — Host: Mch: *Hipposideros diadema griseus*.

PT: ?


Date: 23 May 1928.

Type material: Holotype slide n° 1021 at the U.S. Nat. Mus. Washington

b — Pl. A, 3.

c — SIF = 7B.N.3.2121.001 (?) fPp = (N)-(N)-(N).N.N.

fD = 2H + 8.8.8.6.7.7.2 = 42 fV = 38 NDV = 42 + 38 = 80.

Obs.: The longest scutum among the *Chiroptella*. 

= Trombicula revelae AUDY, 1952 (7) 1954 (9).

a — Host : Mch : Hipposideros sp. — R. 17,108 and 17,107, — 9, — 10.
PT : ?
Loc. : Cave in a limestone hill — 69°27' N., 100°15' E. near Kangar, Perlis, Malaya.
Date : 4 Feb. 1952.
Type material : Holotype n° 24, 251, Raffles Mus., Singapore (new name : SINGAPORE NATIONAL MUSEUM).

b — Pl. A, 4.

c — SIF = 7B.N.3.2121.001  fPp = (N)-(N)-(N).N.N
fD = 2H + 12.10.8.4.2 = 46  fV = 8.8.u.8.10.8.4 = 46
NDV = 46 + 46 = 92.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
50 64 21 26 9 35 24 41 31 56 55 42 40/30 22/32 242 192 210 644

Obs. : Very short scutum resembling that of Leptotrombidium s. str.

II. — Genus Eltonella Audy, 1956.


= Eutrombicula, Lawrence, 1949 (46).

= Neotrombicula Radford, 1954 (64).

= Eltonella (Eltonella) (Audy, 1956), V.-G., 1960 (75), n. comb.

= Eltonella (Chiroptella) V.-G., 1960 (75), in part.

= Eltonella (Coecicula) V.-G., 1960 (75).

= Eltonella (Marcandrea) V.-G., 1960 (74).


= Eltonella (Traubiella), n. sg.

LARVA :

a — Hosts : A, B, H, M, Mch, Mr, fr.
PT : Ears, skin of belly and flanks, membranous wings, skin between squamae of reptiles (H).
Loc : Tropical and subtropical regions, old and new world.
Generotype : Eutrombicula (Eltonella) eltoni Audy, 1956.
b — Pl. A to Z, AA to FF, HH.

c — SIF = \(6B.1^3_3 \cdot 2^1_2 \cdot 1^1_0\)  
\(ST = +\) \(\varphi ST = +\) \(PT = +\) \(PT' = +\) \(PT'' = +\)
\(fSP = 7.7.7\) \(fcx = 2B.2B^*\) \(Ip = 540\) to \(1250\).

*Obs.:* Trombiculini having a punctate scutum, with or without posterior projection and always antero-lateral shoulders. Species rather small to medium in size. Oculate or blind.

**Nymph:** Rather small in size, body eight-shaped with normally proportioned legs. Blind. \(fTn = 9B.3S\). Ratio \(ASL/SB = 2.3\) to \(2.8\).

A. — Subgenus *Traubiella* nov.

a — Host: Mch.
\(PT:\) wings and patagium.
Loc.: Europe, Asia.
Subgenerotype: *Eltonella (Chiroptella) multisternalae* V.-G., 1963, sbg. nov. (76).


c — SIF = \(6B.N.3.3121.000\) \(fPp = (B)-(B)-\ldots\) \(fSP = 7.7.7\)

*Obs.:* large species; scutum typical of *Eltonella*; three genualae, on leg 1; eyes present.


= *Eltonella (Chiroptella) multisternalae* V.-G., 1963 (76).

a — Host: Mch: *Rhinopoma microphyllum microphyllum* — A 211 (ML 21).
\(PT:\) pteri-patagium.
Loc.: Cave Khvadah Largar, Guerechk, Afghanistan.
Date: 19 April 1958.

b — Pl. A, 5.

c — SIF = \(6B.N.3.3121.000\) \(fPp = (B)-(B)-(N).N.B\) \(fSt = 4B.2B.24B\)
\(fD = 2(3H) + (4.6.6).8.8.8.10.10.10.8.8.4.2 = 98\)
\(fV = 12.12.12.8.8.6.8.6.4 = 88\) \(NDV = 98 + 88 = 186.\)

\(AW\) \(PW\) \(SB\) \(ASB\) \(PSB\) \(SD\) \(AP\) \(AM\) \(AL\) \(PL\) \(S\) \(H\) \(D\) \(V\) \(pa\) \(pm\) \(pp\) \(Ip\)
54 75 33 36 24 60 35 68 33 33 92 35 33/25 21/29 434 368 438 1240

*Obs.:* Hirsute species, AM two times as long as are PLs and ALs.

* E. *multisternalae* excepted, with its \(fSt = 4B.2B.24B.\)

a — Hosts : Mr, Mch.
PT : ears, of Mr, Mch ?
Subgenerotype : Trombicula mastomyia Radford, 1942 (59).

b — Pl. B & HH.

Hos. : Eltonella with a pentagonal punctate scutum and sensilla trifurcate ;
blind species ; no mastitarsala.

1. *Eltonella* (Coecicula) *mastomyia* (Radford, 1942) [Ts]. Cl. n° 7.


— *Thrombicula giroudi* André, 1951 (4), 1952 (5).


a — Hosts : Mr : Mastomys coucha erythroleucus, Lemniscomys barbarus striatus,
Myomys cunninghamei alberti, Arvicanthis rufinus, Arvicanthis abyssinicus rubescens, Arvicanthis niloticus, Mus musculus, Rattus norvegicus, Rattus frugivorus.
PT : ears, (auditory duct).
Loc. : Sierra Leone (Freetown) (Type town), Ivory Coast, Cameroun, Ubangi-
Chari, Kivu, Bas Congo, Moyen Congo, Ubangi (ex-Belg. Congo), Oriental
Prov, (ex-Belg. Congo).


b — Pl. B, 7,8,iI,i2,i3.

c — SIF = 6B·N·3.3111.000    /Pp = (B)-(B)-(N).B.B.

*T. m. mastomyia* : jD = 2H + 8.8.6.8.6.4 = 42
fV = 6.4.4.6.4u.4.6.6.4 = 44    NDV = 86.

*T. m. giroudi* : jD = 2H + 8.8.8.6.4.6.2 = 50
fV = 8.10.8.8u.4.4.2 = 44    NDV = 94.
T. m. kivuensis: \( fD = 2H + 8.8.8.8.6.4.2 = 46 \)
\( fV = 8.8.8.8.4.4.2 = 50 \)
NDV = 96.

<table>
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<tr>
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<th>AW</th>
<th>PW</th>
<th>SB</th>
<th>ASB</th>
<th>PSB</th>
<th>SD</th>
<th>AP</th>
<th>AM</th>
<th>AL</th>
<th>PL</th>
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</thead>
<tbody>
<tr>
<td>T. m. m.</td>
<td>42</td>
<td>60</td>
<td>16</td>
<td>25</td>
<td>21</td>
<td>46</td>
<td>23</td>
<td>21</td>
<td>21</td>
<td>34</td>
</tr>
<tr>
<td>T. m. g.</td>
<td>38</td>
<td>53</td>
<td>15</td>
<td>22</td>
<td>20</td>
<td>42</td>
<td>19</td>
<td>29</td>
<td>21</td>
<td>38</td>
</tr>
<tr>
<td>T. m. k.</td>
<td>38</td>
<td>53</td>
<td>15</td>
<td>24</td>
<td>20</td>
<td>44</td>
<td>19</td>
<td>31</td>
<td>21</td>
<td>38</td>
</tr>
</tbody>
</table>

NDV = 46 + 44 = 90.

Obs. : differs from *quasigiroudi* in its dimensions.


a — Hosts: Mch: *Dasymys bentleyae*.
PT: ears.
Loc. : Musha (nr. Astrida), Rwanda-Burundi, Afr.: Ee.
Date : 5 July 1952.
Type material: Holotype in the Musée d’Afrique Centrale, Tervuren, Belgium.


c — SIF = 6B.N.3.3III.000  /Pp = (B)-(B)-(N).B.B
\( fD = 2H + 8.8.8.8.4.4.2 = 44 \)
\( fV = 6.6.6.6.6.6.4 = 46 \)
NDV = 44 + 46 = 90.

<table>
<thead>
<tr>
<th></th>
<th>AW</th>
<th>PW</th>
<th>SB</th>
<th>ASB</th>
<th>PSB</th>
<th>SD</th>
<th>AP</th>
<th>AM</th>
<th>AL</th>
<th>PL</th>
<th>S</th>
<th>H</th>
<th>D</th>
<th>V</th>
<th>pa</th>
<th>pm</th>
<th>pp</th>
<th>Ip</th>
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<tbody>
<tr>
<td>T. m. m.</td>
<td>44</td>
<td>60</td>
<td>16</td>
<td>28</td>
<td>23</td>
<td>51</td>
<td>22</td>
<td>37</td>
<td>28</td>
<td>42</td>
<td>65</td>
<td>42</td>
<td>40/32</td>
<td>28/32</td>
<td>260</td>
<td>222</td>
<td>246</td>
<td>728</td>
</tr>
<tr>
<td>T. m. g.</td>
<td>51</td>
<td>36</td>
<td>31/24</td>
<td>21/24</td>
<td>207</td>
<td>178</td>
<td>193</td>
<td>578</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>T. m. k.</td>
<td>54</td>
<td>42</td>
<td>36/26</td>
<td>22/26</td>
<td>213</td>
<td>179</td>
<td>201</td>
<td>593</td>
<td></td>
<td></td>
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</table>

Obs. : Dimensionally different from all the other *Coecicula*.


= *Trombicula boneti* Hoffman, 1952 (41).
= *Trombicula (Trombicula) boneti*, Brennan & Jones, 1959 (19).

a — Host: Mch: *Mormoops megalophylla*.
PT: ?
Loc. : Cueva de Quintero, Tamaulipas, Mexico: NTc.
Date : 30 Dec. 1950.
Type material: Mexico (Museum ?).

b — Pl. B, 10.

c — SIF = 6B.B.3.3III.000  /Pp = (B)-(B)-(N).N.B
\( fD = 2H + 6.6.6.6.4.2 = 38 \)
\( fV = 2.6.2.6.4.6.6.6.2 = 40 \)
NDV = 38 + 40 = 78.
Obs.: Differs from the preceding in its barbed galeal setae and in its /Pp. Differs from the following species in its dimensions and body setation.


= Trombicula tibbettsi Brennan & White, 1960 (22), Brennan & Jones, 1960 (20).

a — Hosts : Mch. : Mormoops megalophylla senicula, Chilonycteris rubiginosa, Myotis grisescens, Mormoops turmidiceps.

PT : ?

Loc : Frio Cave, Uvalde County, Texas, also from Alabama and Trinidad : S. Date : 17 Nov. 1956.

Type material : Holotype in the Rocky Mountain Laboratory, Hamilton, Montana, U.S.A.

b — Pl. HH, r.

c — SIF = 6B.B.3.3III.000 /Pp = (B)-(B)-(N).N.B.

/D = 2H + 6.6.6.4.4 = 28 /V = 32 NDV = 28 + 32 = 60.

Obs. : Differs from the preceding species in its dimensions and body setae.

Note : Thanks to Dr. Loomis we were able to study two collections of these mites. The first collection by Dr. Brennan (2 specimens), and the second by Dr. Loomis (8 specimens). The study of the leg length of the two specimens provided by Dr. Brennan gave us the following figures :

<table>
<thead>
<tr>
<th>pa</th>
<th>pm</th>
<th>pp</th>
<th>Ip</th>
</tr>
</thead>
<tbody>
<tr>
<td>41/1 : 290</td>
<td>252</td>
<td>275</td>
<td>817</td>
</tr>
<tr>
<td>41/2 : 300</td>
<td>246</td>
<td>280</td>
<td>826</td>
</tr>
<tr>
<td>mean : 295</td>
<td>249</td>
<td>278</td>
<td>822</td>
</tr>
</tbody>
</table>

Dr. Loomis' collection shows the following figures :

<table>
<thead>
<tr>
<th>pa</th>
<th>pm</th>
<th>pp</th>
<th>Ip</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 : 248</td>
<td>197</td>
<td>235</td>
<td>677</td>
</tr>
<tr>
<td>2 : 236</td>
<td>205</td>
<td>222</td>
<td>663</td>
</tr>
<tr>
<td>3 : 236</td>
<td>202</td>
<td>224</td>
<td>662</td>
</tr>
<tr>
<td>4 : 232</td>
<td>194</td>
<td>217</td>
<td>643</td>
</tr>
<tr>
<td>5 : 232</td>
<td>196</td>
<td>220</td>
<td>648</td>
</tr>
<tr>
<td>6 : 236</td>
<td>199</td>
<td>220</td>
<td>655</td>
</tr>
<tr>
<td>7 : 232</td>
<td>194</td>
<td>217</td>
<td>643</td>
</tr>
<tr>
<td>8 : 260</td>
<td>217</td>
<td>232</td>
<td>710</td>
</tr>
<tr>
<td>mean : 239</td>
<td>200</td>
<td>223</td>
<td>662</td>
</tr>
</tbody>
</table>
The collection of Brennan was identified by him as true *tibbettsi*. The specimens of Dr. Loomis were collected in Texas. They show definitely smaller dimensions and could be taken, at least, as a smaller form.


= *Microtrombicula (Marcandrea)* V.-G., 1960 (74).

= *Eltonella (Marcandrea)*, V.-G., 1960 (75).

a — Hosts: A, H.

PT: Sterno-pleural joint of arthropods, under scales of reptiles.

Loc: Central Africa.


b — Pl. A, 14 to 20.

c — SIF = 6B.N.3$^2_{31}$21.00$^0$  \( fPp = (B)-(B)-(B).B.B \)  \( Ip = 620 - 720 \)

ST = +  \( pST = + \)  \( PT = + \)  \( PT'' = + \)

fCx = B.B.B  \( fSt = 2B.2B. \)  \( fPp = 7.7.7 \)

*Obs.*: *Eltonella* with a trapezoidal punctate scutum and branched sensillae; no eyes; two genualae on leg 3 and no mastitarsala.


= *Microtrombicula (Marcandrea) fromonti* V.-G., 1960 (74).

= *Eltonella (Marcandrea) fromonti*, V.-G., 1960 (75), emend.

a — Host: A: *Buthus* sp. (Scorpion).

PT: Sternopleural suture.


Date: 10 Jan. 1957.

Type material: Holotype in the Musée d’Afrique Centrale, Tervuren, Belgium.

b — Pl. B, 14, 16, 17, 18, 19.

c — SIF = 6B.N.3.3121.000  \( fPp = (B)-(B)-(B).B.B \)

\( fD = 2H + 6.6.6.4.2 = 26 \)

\( fV = 4.4.6.4.4 = 20 \)

NDV = 26 + 20 = 46.

AW  PW  SB  ASB  PSB  SD  AP  AM  AL  PL  S  H  D  V  pa  pm  pp  Ip
73  95  31  15  45  26  31  26  34  74  42  34/35  29/34  257  216  246  719

*Obs.*: Differs from the following species in the scutal aspect and in the number of genualae on leg 1.


a — Host: H: *Boaedon lineatus*.

PT: under the dorsal scales near the head.

Date: 13 Feb. 1952.
Type material: Holotype in the Musée d'Afr. Centr., Tervuren, Belgium.

c — SIF = 6B.N.3.2121.001  fPp = (B)-(B)-(B).B.B.
   fD = 2H + 6.6.6.4.4 = 28  fV = 4.4.4.4.2 = 18  NDV = 28 + 18 = 46.

Obs.: See the preceding species. Mastifemorala on leg 3.

D. — Subgenus Eltonella Audy, 1956.

= Eutrombicula (Squamicola) Audy & V.-G., 1961 (17).
= Ellonella (Eltonella), V.-G., 1960 (75).

Larva:
a — Hosts: A, B, H, M, Mr, Mch and fr.
   PT: surface of skin (never in the skin), generally in the ears of B and M.
   Loc: in tropical or subtropical, and equatorial regions, all over the world.
Subgenerotype: Eutrombicula (Eltonella) eltoni Audy, 1956.

b — Pl. C to Z, AA to FF & HH.
c — SIF = 6B.N.3.111.100  fPp = (B)-(B)-(R).B. N. B. N., also
   (R)_(N)-(N).N.   ST = +  PS = +  PT' = +  PT'' = +
   fSp = 7.7.7  fCx = B.B.B  fSt = 2B.2B  Ip = 540 to 900.

Obs.: Sub-pentagonal punctate scutum, with branched sensillae; paired eyes, only one genuala, one tibiala and one mastitarsala on leg 3; the two galeal setae always nude.

Nymph:

fTn = 9B.3S  ASL/IB = 2.4 to 2.9  PGC = 2  PGS = 1
Hyp. = 2(4N)  fSt = 4 to 10 B.
Sens: filamentous. Eyes absent (exceptionally, present in eltoni)
IPn = 900 to 2 000.  fCS = 3 to 10

1. Eltonella (Eltonella) eltoni, (Audy, 1956) [T] [Ts] [grp. T.] Cl. n° 21.

= Eutrombicula (Eltonella) eltoni, Audy, 1956 (11), Womersley & Audy, 1957 (85).
= Ellonella (Eltonella) eltoni, V.-G., 1960 (75).
= Trombicula (Tragardhula) sp. indet., Audy, 1950 (6).
= Trombicula (Trombicula) frittsi, Womersley, 1952 (in part.) (84).
= Trombicula (?) ilesi-grp) frittsi, Audy, 1954 (in part.) (9).
Larva:

a — Host: A: *Heterometrus longimanus* (Giant black scorpion) — R. 7971.
  PT: inter-segmental joints.
  Loc.: Bukit Lagong Forest Reserve, Kepong, Selangor, Malaya: Om.
  Date: 21 September 1949.

b — Pl. C, 1 to 5.

c — SIF = 6B.N.3.311.000  fPp = (B)-(B)-(B).B.B
  fD = 2H + 6.6.4.2.2 = 22  fV = 18  NDV = 22 + 18 = 40.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
48 63 18 20 23 43 17 31 26 32 28/22 15/22 208 188 204 600

Obs.: The only member of subgenus *Eltonella* which is parasitic on arthropods,
and which lacks a mastitarsala 3, by exception.

Nymph:

a — Host: A: *Heterometrus longimanus* — larval stage host.
  Larval date: 21 September 1949.
  Emerg. date: 10 to 14 October, 1949; pupation period: 19 to 23 days.
  Type material: Nymph-Type (BM.1956.8.21) at the British Museum, London.

b — Pl. AT, 1, 2, 3, 4.

c — fTn = 9B.3S  ASL/SB = 2.4  PGC = 2  PGS = 1
  HyP = 2(4N)  fSt = 5 or 6 B.
  Sens: SF = 25 (short barbs), SA = 45 × 3 (breadth) (numerous barbs).
  Eyes present.
  CL = 32  CA = 16  BL = 57  BH = 21  pCS = 2 or 3 (on each side of
  the crista).

  ASL PSL CTL SB S T IL PW OW CW
  60 28 103 25 70 22 375 150 162 120
  P1 P2 P3 P4 Ipu D TL TH tL
  325 195 182 225 927 14/20 73 28 64

Obs.: Very small species; exceptionally oculate, like some *Eutrombicula*.


a — Host: *Procavia* sp.
  PT: ?
  Loc.: Kaabong, Uganda, B.E.Af. : Ee.
Date: 26 Apr. 1952 (and 33 specimens, received later: 21 Sep. 1955; same loc.)
Type material: at the Rocky Mountain Laboratory; Holotype: no 26452/P/1
(RML: 31469).

b — Pl. C, 6 to 10.

c — SIF = 6B.N.3.3III.100  jPp = (B)-(B)-(B).N.B
fCx = B.N".B  fSt = 2B.2N"  fD = 2H + (4.4).(4.4).6.6.4.2 = 36
fV = 4.6.6.4u.6.4 = 34  NDV = 70.

\begin{tabular}{cccccccccccc}
  & AW & PW & SB & ASB & PSB & SD & AP & AM & AL & PL \\
1952 & 75 & 91 & 32 & 28 & 36 & 64 & 28 & 31 & 29 & 38 \\
1955 & 76 & 85 & 30 & 26 & 32 & 58 & 24 & 37 & 28 & 37 \\
  \\% & S & H & D & V & pa & pp & pm & Ip \\
1952 & 64 & 41 & 36/29 & 27/29 & 26 & 223 & 258 & 752 \\
1955 & 65 & 41 & 35/29 & 25/30 & 256 & 214 & 249 & 719 \\
\end{tabular}

Obs.: as they differ very little from each other, probably the two-subspecies will be considered synonyms. Also they could be considered synonyms of bruy-
noghei; perhaps, rossi should be only a subspecies of bruynoghei. However, more material must first be collected, and intermediate populations discovered.


a — Hosts: Mr: Dasmys bentleyae, Otomys irroratus, Thamnomys surdaster.
PT: ears.
Loc.: Astrida (Rwanda-Burundi) : Ee.
Type material: Musée d’Afrique Centrale, Tervuren (Belgium).
b — Pl. E, 1 to 5.
c — SIF = 6B.N.32111.100 /Pp = (B)-(B)-(B).N.B /Cx = B.N.B
/Std = 2B.2N /D = 2H + (4.4).6.6.6.4.2 = 52
/V = 6.6.6.6.4 = 46
NDV = 98.
Obs.: Differs from the previous species in its fairly long and more numerous body hairs.

5. Eltonella (Eltonella) evilla n. sp. Cl. no 22.
a — Host: M: Nasilio brachyrhynchus.
PT: ears.
Loc.: Elisabethville (fam.: E’ville, from which the name evilla), Prov. Katange (Congo): Ec.
Date: March 1926 (on a N. brachyrhynchus — Dr. H. Schouteden, coll., — Musée d’Afrique Centrale, Tervuren (Belgium); specimen no 16441, in alcohol).
Type material: Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).
b — Pl. F, 1 to 5.
c — SIF = 6B.N.323111.100 /Pp = (B)-(B)-(B).N.B /Cx = B.N.B
/Std = 2B.2B /D = 2H + (4.4).6.6.6.4.2 = 36
/V = 6.6.6.6.6 = 30
NDV = 36 + 30 = 66
Obs.: Differs from myonacis in its leg setation.

6. Eltonella (Eltonella) myonacis n. sp. Cl. no 30.

= E. (E.) myonacis myonacis n. ssp. (m. m.).
= E. (E.) myonacis heliosciuri n. ssp. (m. h.).
a — Hosts: \( m. m. \): \( M: \) *Herpestes* (Myonax) sp., *Galago crassicauda agisymbanus*.  
\( m. h. \): \( M: \) *Heliosciurus rufobrachium rhodesia*.  
PT: \( m. m. \): ?; \( m. h. \): ears.  
Loc.: \( m. m. \): Brit. East. Afr.; \( m. h. \): Bukama, Prov. Katanga (Congo) (on a flying squirrel in alcohol in the Musée d’Afrique Centrale, Tervuren (Belgium) — Prof. Dr. Rodhain, Coll. — specimen no 2471 A) : Ee.  
Date: \( m. m. \): ? \( m. h. \): 30 December 1955.  
Type material: Musée d’Afrique Centrale, Tervuren (Belgium).


c — \( \text{SIF} = 6B.N.3.3III.100 \) \( m. m. \): \( /Pp = (B)-(\overset{N}{N})-(\overset{N}{N}).N.\overset{N}{N}. \)  
\( /Cx = B_3.N'.B_4 \) \( /St = 2N'.2N' \)  
\( m. h. \): \( /Pp = (B)-(B)-(B).N.B \) \( /Cx = B.B.B \) \( /St = 2B.2B. \)  
\( m. m. : /D = 2H + 8.6.6.6.4.4 = 36 \) \( /F = 6.6.4.6.6.2 = 36 \) NDV = 72  
\( m. h. : /D = 2H + (6.2).6.6.6 = 32 \) \( /F = 6.4.4.4.2.2 = 32 \) NDV = 64.

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<td>178</td>
<td>206</td>
<td>588</td>
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</tbody>
</table>

Obs.: The two subspecies have well contrasted characters, and both differ from the previous species in the measurements.


a — Host: Mch: *Phyllostomus discolor*.  
PT: ?  
Loc.: Emperor Valley Zoo, Port of Spain, Trinidad: NTc.  
Date: ?  
Type material: Holotype, RML no 34680 at the Rocky Mountain Laboratory, Hamilton, Montana, USA.

b — Pl. FF, 9.

c — \( \text{SIF} = 6B.N.3.3III.100 \) \( /Pp = (B)-(B)-(B).N.B \) \( /Cx = B.B.B \)  
\( /St = 2B.2B \) \( /D = 2H + 6.6.4.2.2 = 28 \) \( /V = \ldots ? = 28 \)  
NDV = 28 + 28 = 56.

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<td>31</td>
<td>23</td>
<td>36</td>
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</tbody>
</table>

Obs.: Differs from any other known species in its measurements and in its peculiar sensillae.

= Trombicula fragibarba BRENNAN & JONES, 1960 (20).

a — Hosts: B: Amazona amazonica; Mr: Rhipidomys couesi, "rat".
PT: ?
Loc.: Melaho Forest; Cumaca, and Rio Grande Forest in Trinidad: NTc.
Date: 21 January 1956.
Type material: Holotype RML n° 33808 at the Rocky Mountain Lab., Hamilton, Montana, USA.

b — Pl. FF, 4.

c — SIF = 6B.N.3.311.100  fPp = (B)-(B)-(B).N.B  fCx = B.B.B
fSt = 2B.2B  fD = 2H + 6.6.6.4.2 = 26  fV = ... ? = 22
NDV = 26 + 22 = 48.

Obs.: Differs from all other species in its body setation and in its dimensions, and from carmenae in the more numerous and shorter branches on the sensillae.


= Trombicula parvula FAURAN, 1960 (34).

a — Host: B: Selenidera sp.
PT: on the skin around the bird’s beak.
Loc.: near Degrad-Stoupan, 12.5 miles S.W. of Cayenne, Fr. Guyana: NTc.
Date: 19 October 1959.
Type material: Holotype at the Muséum d’Histoire Naturelle, Paris, France.

b — Pl. HH, 5.

c — SIF = 6B.N.3.311.100  fPp = (B_i)-(B_i)-(B_i).N.B_1.B_2
fCx = B.B.B
fSt = 2B.2B  fD = 2H + 6.6.6.4.6.2 = 32
fV = 4.4.6.4.4.2.4 = 24  NDV = 32 + 24 = 56.

Obs.: Differs from carmenae in aspect of the sensilla.


= Trombicula quintangula BRENNAN & JONES, 1961 (21).

a — Hosts: Mch: Phyllostis sp., Mr: Hesperomys sp.
PT: ?
Loc.: N. Tarata, Tacna, Peru; and Rio Santa Rosa, Puno, Peru: NTc.
Date: 24 January 1952 and 16 December 1951.

Type material: Holotype RML no 34758, at the Rocky Mountain Lab, Hamilton, Montana, USA.

b — Pl. FF, 2.

c — SIF = 6B.N.3.2111.100 /Pp = (B)-(B)-(B).B.B /Cx = B.B.B

/D = 2B.2B /D = (2 \times 5H) - \ldots? = 70 /V = \ldots? = 60

NDV = 70 + 60 = 130.

Obs. : Differs from all the other related species in its abundant body setation. Only two genualae on leg 1.

II. Eltonella (Eltonella) biops (Wharton, 1948). Cl. no 14.

= Trombicula biops Wharton, 1948 (81), Brennan & Jones, 1961 (21).

= Trombicula (Trombicula) biops, Wharton & Fuller, 1952 (82).

a — Hosts: Mch: Phyllotis boliviensis, P. darwini.

PT: ?

Loc.: Caccachara, 50 miles S.W. of Ilave, Peru, NTC.

Date: 28 September and 5 October 1946.

Type material: Holotype MCZ no 3029, at the Harvard Museum of Comparative Zoology, Cambridge, Mass., USA.

b — Pl. FF, 1.

c — SIF = 6B.N.3.2111.000 /Pp = (B)-(B)-(B).B.B /Cx = B.B.B

/D = 2H + 8.8.6.8.6.6.4.2 = 60

NDV = 60 + 40 = 100.

Obs. : Two genualae on leg 1, no mastitarsala on leg 3.

12. Eltonella (Eltonella) smithi n. sp. Cl. no 43.

a — Host: M: Heterohyrax drucei.

PT: ?

Loc.: Lake Victoria, B.E. Afr., Ee.

Date: 1953.

Type material: Musée d’Afrique Centrale, Tervuren, Belgium.

b — Pl. J, 1 to 5.

c — SIF = 6B.N.3.3111.100 /Pp = (B)-(B)-(B).N.B /Cx = B3,N*B4

/D = 2B.2N* /D = 2H + (10.2).8(8.2).6.6.2 = 46

/V = 4.6.6.4.6.*6.4.2 = 38 NDV = 84.
Obs. : Differs from any other species in its peculiar dorsal formula (fD), and general body setation.

13. Eltonella (Eltonella) rosamonda n. sp. Cl. n° 39*.

a — Host : B : Lissotis melanogaster.
PT : in ears and on the neck skin.
Date : 11 February 1956.
Type material : Musée d’Afrique Centrale, Tervuren (Belgium) ; Holotype n° II256/6.

b — Pl. I, 1 to 5.

c — SIF = 6B.N.3.3III.100  fPp = (B)-(B)-(B).B.B  fCx = B.B.B
  fSt = 2B.2B  fD = 2H + 8.8.6.4.2 = 36
  fV = 6.6.4.4.4,4 = 36  NDV = 72.

Obs. : Differs from any related species in its dimensions, allied to the leg setation.

= Trombicula quasisicei TAUFFLIEB, 1958 (67).
= Trombicula (Trombicula) quasisicei, TAUFFLIEB, 1960 (69).

a — Hosts : Mr : Dasymys incomtus, Lemniscomys striatus, Mastomys coucha, Rattus frugivorus, R. alexandrinus.
B : Centropus senegalensis, Sarciohorus tectus, Francolinus clappertoni.
PT : ears.
Loc. : Mr : Brazzaville (Congo Rep) and Borna (Rep. of Congo) : Ec.
B : Sangaleam, Gorom and Nioro (Congo Rep) : Ec.
Date : 1st October, 1952.

b — Pl. FF, 3.

c — SIF = 6B.N.3.3III.100  fPp = (B)-(B)-(B).B1.B  fCx = B.B.B
  fSt = 2B.2B  fD = 2H + 8.8.6.4.2 = 34
  fV = 6.6.4.4.4,6.2,2 = 34  NDV = 34 + 34 = 68.

Obs. : Very different from sicei, but somewhat similar to rosamonda and saperoi.

* Dedicated to an efficient collaborator, Mrs. ROSAMONDE HOLLY.

= *Neotrombicula saperai* Radford, 1954 (64) (65).

a — Host: MR: *Rattus rattus rattus*.

PT: ?

Loc. : Ta’izz, Yemen (Arabia) : Ee.

Date: 1951.

Type material: Holotype in the U.S. National Museum, Washington D.C., USA.

b — Pl. HH, 3.

c — SIF = 6B.N.3.3III.I00 \( fPp = (B)-(B)-(B).B.B \) \( fCx = B.B.B \)

\( fSt = 2B.2B \) \( fD = 2H + 8.8.6.4.4.2 = 40 \) \( fV = ... ? = 58 \)

NDV = 40 + 58 = 98.

Obs.: Differs from the preceding species in the more numerous body setae.


= *Trombicula (Trombicula) abyssinica*, Wharton & Fuller, 1952 (82).

a — Host: B: *Vidua fischeri*.

PT: ?

Loc.: Dira Daua, Abyssinia: Ee.

Type material: Holotype in the British Museum, London.

b — Pl. FF, 5.

c — SIF = 6B.N.3.3III.I00 \( fPp = (B)-(B)-(B).B.B \) \( fCx = B.B.B \)

\( fSt = 2B.2B \) \( fD = 2H + 8.8.6.4.4.2 = 36 \)

\( fV = 6.4.4.6u.4.4.4.2 = 34 \) NDV = 70.

Obs.: Differs from *saperai* in its scutal shield and setation; in its dimensions and aspect.

17. *Eltanella (Eltanella) pembaensis* n. sp. Cl. n° 34.

a — Hosts: MR: "rodents?" ; coll. Dr. Lumsden, n° 548, 560, 574, 578, 615 (50 specimens).

PT: ?
Date : ?
Type material : Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. J, 1.

c — SIF = 6B.N.3.3II.100 /Pp = (B)-(B)-(B).N.B /Cx = B.N".B
St = 2B.2N" /D = 2H + (4.4).6.6.6.4 = 38
V = 6.6.6.2,6.6.6.4 = 42 NDV = 38 + 42 = 80.

Obs. : The measurements show a species very different from the preceding and also from hyracis.

18. Eltonella (Eltonella) hyracis n. sp. Cl. n° 27.

a — Host : M : Hyrax ?
PT : ?
Date : 21 April 1955.
Type material : Holotype n° 21455/II/I, at the Musée d’Afrique Centrale, Tervuren (Belg.).


c — SIF = 6B.N.3.3II.100 /Pp = (B)-(B)-(N".N.N" /Cx = B₃,N".B₂
St = 2N".2N".
AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
59 68 25 25 31 56 27 32 30 58 40 36/29 22/29 216 192 212 620

Obs. : Somewhat similar to smithi, it differs from that species in the body setation.

19. Eltonella (Eltonella) sporopipia n. sp. Cl. n° 44.

a — Host : B : Sporopipes squamifrons ; coll. S.A.I.M.R., Dr. Zumpt.
PT : ?
Date : 7 Apr. 1962.
Type material : Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. K, 1 to 7.

c — SIF = 6B.N.3.2II.100 /Pp = (B)-(B)-(B).N.B /Cx = B.B.B
St = 2B.2B /D = 2H + 8.8.6.6.4.2 = 42 V = 6.6.6.6u.4.2 = 30
NDV = 42 + 30 = 72.
Obs. : Scutum rather similar to that of abyssinica; the scutal setation is different and there are two genualae on leg 1 instead of three.


= Eltonella (Eltonella) ugandae felis n. ssp.

Note: Three other variations of E. ugandae will be studied here after, under the three following distinctive signs : Ot/B, Oh/S, Pf/S.

a. Eltonella (Eltonella) ugandae ugandae


Larva:

a — Hosts: M : Canis familiaris ; B : Centropus grilli.
PT: eyelid of dog, skin of neck and belly of bird.
Date : June 11, 1952 (dog) ; 23 May 1954 (bird).
Type material : Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. L, 1 to 4.

C — SIF = 6B.N,3,,III,100 /Pp = (B)-(B)-(B).N.B /Cx = B.B.B
 /St = 2B.2B /D = 2H + 10.8.4.4.2 = 38
 /V = 6.4.4.6.6.6,4,2 = 38 NDV = 76.

Obs. : Differs from the other subspecies in its measurements and in the appearance of its scutum.

Nymph:

a — Host : Centropus grilli.
Larval Date : 23 May 1954.
Emerg. date : 14 June 1954; pupation period : 22 days.
Type material : Nymph-type in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. L, 5 and N, 3, 4.

C — fTn = 9B.3S ASL/SB = 2.7 PGC = 2 PGS = 1
Hyp. = 2 (4N) /St = 7 to 9B.
Sens: SP = 44 (short, fine barbs), SA = 74 (slender with 13 to 16 thin branches).

CL = 47  CA = 21  BL = 87  BH = 40  pCS = 5 to 6 (on each side).

ASL  PSL  CTL  SB  S  T  IL  PW  OW  CW
92  36  155  34  228  27  470  234  240  208

P₁  P₂  P₃  P₄  IPn  D  TL  TH  tL
490  354  354  434  1632  16/22  118  53  89

Obs.: Differs from ssp. felis in its dimensions and setation.

b. *Eltonella (Eltonella) ugandae* "Ot/B", (variation).

a — Host: Mr: *Otomys tropicalis elongis*.
PT: ears (audit. duct).
Loc.: Bukavu (Kawa), Kivu Prov., Rep. of Congo: Ec.
Date: Jul. 1952.
Ref. material: specimen n° 752/36/1 at the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. O, 1.

c — SIF = 6B.N.3.2111.100  /Pp = (B)-(B)-(B).N.B  /Cx = B.B.B
/St = 2B.2B  /D = 2H + 10.8.6.4.2 = 38
/V = 6.6.6.6.6u.4.2 = 30  NDV = 38 + 30 = 68.

AW  PW  SB  ASB  PSB  SD  AP  AM  AL  PL  S  H  D  V  pa  pm  pp  Ip
55  62  20  21  28  49  25  31  27  40  70  38  34/30  22/31  224  182  214  620

Obs.: Small in contrast to all the others.

c. *Eltonella (Eltonella) ugandae* "Oh/S", (variation).

a — Host: Mr: *Oenomys hypoxanthus*.
PT: in the external ear duct.
Date: 14 Dec. 1954.
Ref. material: specimen n° 14125/P/1, in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. O, 2.

SIF = 6B.N.3.2111.100  /Pp = (B)-(B)-(N°).N.B  /Cx = B.B.B
/St = 2B.2B  /D = 2H + 10.8.8.6.4.2 = 40  /V = 6.6.6.6.6u.4.2 = 36
NDV = 40 + 36 = 76.

AW  PW  SB  ASB  PSB  SD  AP  AM  AL  PL  S  H  D  V  pa  pm  pp  Ip
58  62  18  24  29  53  26  37  31  44  72  37  40/30  28/31  234  200  232  666

Obs.: Differs from the others in its dimensions and pilosity.
d. Eltonella (Eltonella) ugandae "PfJS", (variation).

a — Host : Mr : Pelomys fallax.
   PT : ears.
   Date : 14 Dec. 1954.
   Ref. material : specimen n° 14125/F/1, in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. O, 3 to 7.

c — SIF = 6B.N.3.21111.100 /Pp = (B)-(B)-(B).N.B /Cx = B.B.B
   /St = 2B.2B /D = 2H + (1.0.2).8(2.1).6.6.2 = 46
   /V = 4.6.4.6.6.6.4.2 = 38  NDV = 84.

Obs. : Characteristically different from the preceding form, in its dorsal setal arrangement.

e. Eltonella (Eltonella) ugandae felis n. ssp.

**LARVA** :

a — Hosts : M : Felis serval.
   PT : on skin, armpit.
   Date : 23 May 1954.
   Type material : Holotype n° 23554/T/1, at the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. M, 1 to 5, and P, 7 to 10.

c — SIF = 6B.N.3.31111.100 /Pp = (B)-(B)-(B).N.B /Cx = B.B.B
   /St = 2B.2B /D = 2H + 10.8.6.4.4.2 = 36
   /V = 6.6.4.4.4.6.6.4.2 = 38  NDV = 36 + 38 = 74.

**NYMPH** :

a — Host : M : Felis serval.
   Larval date : 23 May 1954.
   Emerg. date : 19 June 1954 ; pupation period : 27 days.
   Type material : Nymph-type n° N : 19654/1, in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. M, 6 and N, 1, 2.
c — \( fTn = 8B.3S \)  \( ASL/SB = 2.73 \)  \( PGC = 2 \)  \( PGS = 1 \)

Hyp. 2 (4N)  \( fSt = 6B. \)

Sens : \( SP = 48 \) (short and fine barbs) \( SA = 70 \) (slender, 10 to 12 branches).

\( CL = 44 \)  \( CA = 21 \)  \( BL = 80 \)  \( BH = 22 \)  \( pCS = 2 \) or 3 (on each side).

\[
\begin{array}{cccccccc}
\text{ASL} & \text{PSB} & \text{CTL} & \text{S} & \text{T} & \text{IL} & \text{PW} & \text{OW} & \text{CW} \\
82 & 36 & 136 & 118 & 24 & 415 & 193 & 200 & 178 \\
\end{array}
\]

\[
\begin{array}{cccccccc}
P_1 & P_2 & P_3 & P_4 & IPn & D & TL & TH & tL \\
415 & 273 & 282 & 325 & 1205 & 18/24 & 92 & 38 & 71 \\
\end{array}
\]

\text{Obs. : Smaller than ssp. } \text{ugandae} \text{ ; rachis of the body setae more slender.}

\text{Observations on the species } \text{ugandae} \text{ and } \text{polymorpha} :

1) \( E. \) \text{ugandae} \text{ and } \( E. \) \text{polymorpha} \text{ are two closely related species ; the four major differences are : } a) \text{ posterior scutal edge more sharply pointed in } \text{polymorpha} ; b) \text{ first dorsal row of setae having 10 setae in } \text{ugandae} \text{, 8 in } \text{polymorpha} ; c) \text{ solenidion r and 2 smaller in } \text{polymorpha} ; \text{ d) mastitarsala 3 in proximal position for } \text{ugandae} \text{ with respect to the two nearest plumose setae.}

2) The species \( \text{ugandae} \) \text{ is of particular interest due to the individual instability of one very peculiar and important taxonomic character : the number of } ga \text{ (or genualae r). This number sometimes varies on specimens belonging to the same population, indicating an actual instability of the character. For the three variations : } \text{Ot/B, Oh/S} \text{ and } Pf/S, \text{ the number is invariably 2ga on the first pair of legs. In contrast, in } \text{ugandae} \text{ and } \text{felis} \text{, the number is usually 3ga, with only two exceptions seen in each subspecies. It is to be noted that the number of } ga \text{ is always 3 for the species } \text{polymorpha.}

21. \text{Eltonella (Eltonella) polymorpha} \text{ n. sp.} \text{ Cl. no 35.}

\text{=} \text{ E. (E.) polymorpha polymorpha} \text{ n. ssp. (a)}

\text{=} \text{ E. (E.) polymorpha streptopelia} \text{ n. ssp. (b)}

a. \text{Eltonella (Eltonella) polymorpha polymorpha} \text{ n. ssp.}

\text{LARVA :}

a — \text{ Hosts : B : } \text{Centropus grilli, C. superciliosus, Bubo lacteus.}

\text{PT : Skin of neck, belly and genital region.}

\text{Loc. : Luvungi (Ruzizi Valley) and Bukavu, Kivu Prov., Rep. of Congo, Africa : Ec.}


\text{Type material : Holotype in the Musée d'Afrique Centrale, Tervuren (Belgium).}

b — \text{ Pl. P, 1, 2, 3, 4, 5.}
- 72 -

c — SIF = 6B.N.3:3:11.I.100  /Pp = (B)-(B)-(B).N'.B  /Cx = B.B.B
   /St = 2B.2B  /D = 2H + 8.8.6.4.4.2 = 34  /V = 6.6.6.6.6.4.2 = 36  NDV = 34 + 36 = 70.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
58  68  22  25  30  55  26  33  25  41  66  36  34/28  25/30  258  218  252  728

Obs. : Differs from the ssp. *streptopelia* in its dimensions and body pilosity.

**Nymph** :

a — Host: *Centropus grilli* (Luvungi).
   Larva Date: 23 May 1954.
   Emerg. Date: 10 June 1954; pupation period: 26 days.
   Type material: Nymph-type in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. Q, 1, 2, 3.

c — /Tr = 9B.3S  ASL/SB = 2.6  PGC = 2  PGS = 1  Hyp. = 2 (4N)
   /St = 8 to 10 B.
   Sens: SP = 46 (short, fine barbs) SA = 86 (slender, with about 10 branches).
   CL = 49  CA = 23  BL = 102  BH = 40  pCS = 6 to 9 (on each side).

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<th>SB</th>
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<tr>
<td>P1</td>
<td>P2</td>
<td>P3</td>
<td>P4</td>
<td>IP</td>
<td>D</td>
<td>TL</td>
<td>TH</td>
<td>tl</td>
<td></td>
</tr>
<tr>
<td>516</td>
<td>336</td>
<td>340</td>
<td>410</td>
<td>1602</td>
<td>18/22</td>
<td>121</td>
<td>56</td>
<td>88</td>
<td></td>
</tr>
</tbody>
</table>

Obs. : Differs very little from *E. uganda uganda*.

b. **Eltonella (Eltonella) polymorpha streptopelia** n. ssp.

a — Hosts: B: *Streptopelia semitorquata semitorquata*, *Lissotis melanogaster*.
   PT: skin of neck, ears and eylid.
   Dates: 23 May 1954 (*Streptopelia*), 27 July, 1954 (*Lissotis*, Luvungi), and
   Type material: Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. P, 4, 5, 6, 7.

c — SIF = 6B.N.3:3:11.I.100  /Pp = (B)-(N')-(B).N'.B  /Cx = B.B.B
   /St = 2B.2B  /D = 8.8.8.6.4.2 = 36  /V = 4.6.6.4.6.4.2 = 32
   NDV = 36 + 32 = 68.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
53  62  19  20  32  52  23  30  25  32  60  35  34/27  23/30  235  205  235  675

Obs. : Smaller ssp.
22. Eltonella (Eltonella) centropi n. sp. Cl. no 19.

= E. (E.) centropi centropi n. ssp. (a)

= E. (E.) centropi yangi n. ssp.¹ (b)

a. Eltonella (Eltonella) centropi centropi n. ssp.

LARVA :

a — Host : B : *Centropus grilli*.

PT : ears.


Date : 23 May 1954.

Type material : Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. R, 1, 2, 3, 4, 5.

c — SIF = 6B.N.3.3.N1.100

| Fp | = | (B)-(B)-(N).N.B |

| Cx | = | B.B.B |

| St | = | 2B.2B |

| D  | = | 2H + 8.8.6.6.6.4 = 40 |

| V  | = | 6.6.6.4.4.2.4.2 = 38 |

NDV = 40 + 38 = 78.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip

| 58 | 60 | 20 | 22 | 26 | 48 | 22 | 26 | 34 | 60 | 38 | 34/20 | 20/34 | 203 | 174 | 200 | 576 |

Obs. : Differs from ssp. yangi in its ga = 3, in its palpal formula (fPp), and in its body setation formulae. There are, besides, some more observations made on 42 specimens:

1) The ga is ordinarily 3, but one may also find on one side ga = 2 at the rate of 3.56 %, which is quite minor.

2) The leg measurements show the following extremes:

| Pa | pp | pm | Ip |

| — | : | 195 | 163 | 190 | 548 |

| + | : | 217 | 184 | 210 | 608 |

Mean : 203 173 200 576

Which means a variation of : ± 5.1 %

3) The possibilities of variation in the fD are rather large; these variations in the dorsal setae formula are studied in the following table, using the 42 specimens available:

<table>
<thead>
<tr>
<th>Setae Rows.......</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean formula......</td>
<td>8</td>
<td>8</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>4</td>
<td>—</td>
<td>(2H + 8.8.6.6.4 = 40)</td>
</tr>
<tr>
<td>Number of cases...</td>
<td>30</td>
<td>39</td>
<td>27</td>
<td>36</td>
<td>39</td>
<td>33</td>
<td>27</td>
<td>33</td>
</tr>
<tr>
<td>%</td>
<td>71.43</td>
<td>92.86</td>
<td>64.29</td>
<td>85.71</td>
<td>92.86</td>
<td>78.57</td>
<td>64.29</td>
<td>78.57</td>
</tr>
<tr>
<td>Highest numbers...</td>
<td>10</td>
<td>10</td>
<td>8</td>
<td>8</td>
<td>7</td>
<td>6</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>Number of cases...</td>
<td>4</td>
<td>1</td>
<td>8</td>
<td>2</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>9.52</td>
<td>2.38</td>
<td>19.04</td>
<td>4.76</td>
<td>2.38</td>
<td>4.76</td>
<td>2.38</td>
<td></td>
</tr>
<tr>
<td>Other numbers....</td>
<td>9</td>
<td>9</td>
<td>7</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Number of cases...</td>
<td>8</td>
<td>2</td>
<td>7</td>
<td>4</td>
<td>2</td>
<td>7</td>
<td>14</td>
<td></td>
</tr>
<tr>
<td>%</td>
<td>19.04</td>
<td>4.76</td>
<td>16.67</td>
<td>9.52</td>
<td>4.76</td>
<td>16.67</td>
<td>33.33</td>
<td></td>
</tr>
</tbody>
</table>

¹ This sub species is dedicated to Mrs. Yee Mui Yang, my assistant, in recognition of her untiring work.
N.B. : As a conclusion to this study : although dorsal and ventral setae arrangements are very often irregular and asymmetrical, measurements of a suitable number of specimens lead to an average or mean formula, regular and symmetrical.

NYMPH:

a — Host : *Centropus grilli*.
Larva Date : 23 May 1954.
Emerg. Date : 10, 12 and 14 June 1954; pupation period : 18 to 22 days.
Type material : Nymph-type in the Musée d'Afrique Centrale, Tervuren (Belgium).

b — Pl. S, 1, 2.

c — \( f_{Tn} = 9B.3S \) \( ASL/SB = 2.04 \) \( PGC = 2 \) \( PGS = 1 \) \( Hyp. = 2 \) (4N)
\( f_{St} = 5 \) to 7B.
Sens : \( SP = 24 \) (short fine barbs) \( SA = 42 \) (rather enlarged; many branches).
\( CL = 34 \) \( CA = 19 \) \( BL = 74 \) \( BH = 42 \) \( p_{CS} = 3 \) (on each side).

Obs. : Very different from any other species in its measurements; ASL/SB rate, sensilla, etc.

b. *Eltonella (Eltonella) centropi yangi* n. ssp.

a — Host : B : *Centropus superciliosus*.
PT : neck skin.
Date : 15 July 1957.
Type material : Holotype in the Musée d'Afrique Centrale, Tervuren (Belgium).

b — Pl. R, 6, 7, 8, 9, 10.

c — \( f_{St} = 6B.2B.2B \) \( f_{D} = 2H + 8.6.4.4.4.4 = 30 \) \( f_{V} = 6.6.4.4.6.4.4 = 30 \)
\( NDV = 30 + 30 = 60 \).

Obs. : Same three-branched sensilla as in the previous ssp., smaller gnathosoma.

23. *Eltonella (Eltonella) sicei* (Marc André, 1951). Cl. no 42.

= *Thrombicula sicei* Marc André, 1951 (4).
= *Trombicula (Thrombicula) sicei*, Wharton & Fuller, 1952 (82), Audy & V.-G., 1961 (17)

a — Hosts : Mr : *Mylomys cunninghamei alberti* (Type material), *Lemniscomyys striatus*, *Anomalurus pusillus*, *Thryonomys swinderianus*, *Rattus frugivorus*,
Mastomys coucha. B: Gallus domesticus, Numida meleagris, Ptilopachus petrosus, Francolinus bicalcaratus.

PT: ears, on skin.
Loc.: Oubangui-Chari (French Congo), Bossangoa, Bouar, Mere and Yaka; Ubangui (Belgian Congo): Ec.
Date: type material: 12 Oct. 1950.
Type material: Holotype in the Muséum d'Histoire Naturelle, Paris (France).

24. Eltonella (Eltonella) tardaea n. sp. Cl. n° 45.

Eltonella (Eltonella) celiae n. sp. 1. Cl. n° 18.

NOTE: As already observed on other occasions and noticed by several authors, the coexistence of two forms in the same population of chigger mites is a very con-
tradicory feature. In the case of *E. celiae* one is able to separate the free-living mites in two definite lots: one consisting of large specimens, the other composed of small representatives. In this work the large mites will constitute the type material of *E. celiae*, the smaller ones will be considered as a variation and designated as *E. celiae* "M".

a. *Eltonella (Eltonella) celiae* n. sp.

a — Host: fr: the larvae were found: "... swarming at the tops of the ventilation shafts of the mounds of *Macrotermes bellicosus* Smeath., both inside and, outside the shaft, but only over the apical few inches of the shaft. The mites exhibit the phenomenon of 'clustering' on high points of the micro-habitat. Do not attempt to bite man apparently. Colour: Dull white, with red eyespots." ... after Dr. D. MINTER (in litt., 1956).


Type material: Holotype in the Musée d'Afrique Centrale, Tervuren (Belgium).

b — Pl. U, 4, 5, 6 & V, 4, 5, 6.

c — SIF = 6B.N.3:3111.100  

IPp = (B)-(B)-(B).N.B  

/Cx = B.B.B  

/ST = 2B.2B  

/D = 2H + (4.6).6.6.6(2.8).8.4.2 = 54  

/V = (2.6).6.6.6.6.6.4 = 48  

NDV = 102.

Obs.: Very close to the form "M", but larger in size. Some variation occurs in the number of branches on the palpal setae; sometimes the /Pp may be different from one palpus to the other on the same specimen. The observed /Pp's are comprised in the two formulae:

/IPp = (B)-(B2)-(B3).N.B1, and /Pp = (B)-(B3)-(B2).N.B3.

The setae Cx1, Cx2, and St1 are distinctly branched (4 to 6 branches) but Cx2 and St2 are definitely barbed (Pl. U, 4 — Cx1, Cx2, Cx3 & St1, St2).

On rare occasions the galeal setae may bear a thin branch, always unilateral on the observed material (13 B1 for 87 N).

Variations were also found in the number of accessory prongs on the palpal claws, using 19 specimens. Usually these variations are unilateral:


The measurements show very few variations; for example, the Ip varies only between 846 and 888, i.e. ± 2.45.

b. *Eltonella (Eltonella) celiae* "M", (variation).

a — Host: fr: free in the same biotope as that of the previous large form (and in its close company).

Loc.: see *celiae*. 

---

76 --
Date: same as celiae.
Type material: Holotype in the Musée d'Afrique Centrale, Tervuren (Belgium).

b — Pl. U, 1, 2, 3 and V, 1, 2, 3.

c — SIF = 6B.N.3.3III.100 /Pp = (B)-(B2)-(B1).N.B1 /Cx = B.B.B
/Sf = 2B.2B /D = 2H + (4.4).6.6.6.6.4.2 = 46
/V = (2.6).6.6.6.6.6.6.6 = 48 NDV = 94.

Obs.: Size smaller in comparison to celiae s. str.. The caudal setae of both forms are thickened; those of "M" are thicker and shorter (Pl. V, 1 and 4 D). Also there is a marked difference in the solenidions of leg-tarsus 2, and in the relative position of the microspurs (famuli) of leg-tarsus 1 (Pl. V, 2, 3 and 5, 6). Finally, there are definite differences in the scuta of the two forms.

PECULIAR CONSIDERATION: E. celiae was captured in the same vicinity as an adult described under the name of Tenotrombicula minteri n. g., n. sp., V.-G. (87). It is quite possible that this adult is the parent of the chigger-mite celiae. In that case, this would be an interesting example of morphological divergence of adults due to an ecological influence (as termitarium dweller). It is to be noted that the characters of T. minteri could fit in with those of a mite having a fT = 6B, and belonging to the genus Eltonella.

26. Eltonella (Eltonella) buxtoni (Womersley, 1952). Cl. no 16.

= Trombicula buxtoni Womersley, 1952 (84), Radford 1954 (64).

= Trombicula (Trombicula) buxtoni, Audy, 1954 (9).

= Trombicula (Miyatrombicula) buxtoni, Womersley & Audy, 1957 (85).

Note: Womersley and Audy (1957) erroneously placed this species in Miyatrombicula only on account of its scutal shape and its bisetose coxa 3.

a — Host: Mr: "yellow rat"?
PT: ?
Loc.: Ranikhet, Kumaon Hills, India: Oi.
Date: 20 Oct. 1946.
Type material: Holotype in S. Australian Mus., Adelaide (S. Australia).

b — Pl. RR, 12.

c — SIF = 6B.N.3.3II.100 /Pp = (B)-(B)-(B).B.B /Cx = B.B.2B
/Sf = 2B.2B /Sp = 7.7.7 /D = 2H + 6.6.4.4.4.4 = 30
/V = 4.6.6.6.6.4 = 34 NDV = 64.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm p pp Ip
47 48 20 30 24 54 28 38 23 40 74 44 43/33 26/37 262 225 261 748
Obs. : This species is more or less related to E. celiae in its general aspect; it differs definitely in its two setae on coxa 3. Similarities in coxa 3 multiseta-tion exist also in M. (S.) crossleyi, M. (S.) trisetica and M. (S.) rajoriensis.

On another hand, E. buxtoni is also slightly related to M. (S.) rajoriensis.

27. Eltonella (Eltonella) tweediei (Audy, 1956). Cl. n° 47.
=Eutrombicula (Eltonella) tweediei AUDY, 1956 (11), AUDY, 1957 (13).

a — Hosts : H : Draco fimbriatus, D. volans.
PT : ?
Type material : Holotype, CORU. 40789, in the British Museum, London.

b — Pl. W, 1 to 9.

c — SIF = 6B.N.3.3IIII.100 fPp = (N)-(N)-(N).N.B NDV = 22 + 16 = 38

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
48 59 17 17 24 41 19 26 22 26 50 25 23/18 22/20 184 170 188 342

Obs. : more or less related to E. draconensis, differs in its scutum, its fPp and its fairly long solenidion on leg-tarsus 1.

28. Eltonella (Eltonella) nivaria (Lawrence, 1949). Cl. n° 31.

=Eutrombicula nivaria LAWRENCE, 1949 (46).
=Trombicula nivaria, RADFORD, 1954 (64).
=Trombicula (Trombicula) nivaria, WHARTON & FULLER, 1952 (82), AUDY, 1954 (8).
=Eutrombicula (Squamicola) nivaria, AUDY & V.-G., 1961 (17).

a — Host : H : Afroedura nivaria.
PT : ?
Date : Jan 1949.
Type material : syntype N.M. 4817, in S. Australian Museum, Adelaide (S. Australia).

b — Pl. X, 1 to 9.

c — SIF = 6B.N.3.3IIII.100 fPp = (B)-(N)-(N).N.N fCx = B.B.B
fSt = 2B.2B fD = 2H + 8.6.6.4.4 = 30 fV = 4.6.6.4.2.6.4.4.2 = 38
NDV = 30 + 38 = 68.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
53 72 21 26 29 55 29 27 25 34 60 35 33/26 23/29 234 208 234 676
Obs. : Differs from *E. homopholis* in the scutum’s appearance, the body setation, and the solenidions of leg-tarsi 1 and 2.


= *Eutrombicula homopholis* LAWRENCE, 1949 (46), RADFORD, 1954 (64).
= *Trombicula (Eutrombicula) homopholis*, WHARTON & FULLER, 1952 (82).
= *Trombicula* (Unallocated) *homopholis*, AUDY, 1954 (8).
= *Eutrombicula (Squamicola) homopholis*, AUDY & V.-G., 1961 (17).

a — Host : *Homopholis wahlbergii*.
PT : ?
Loc. : Nelspruit, Eastern Transvaal, S. Africa : Es.
Date : Feb. 1939.
Type material : syntype N.M. 2372, in Natal Museum (S. Africa).

b — Pl. Y, 1 to 7.

c — SIF = 6B.N.3.3111.100  
/Pp = (B)-(N)-(N).N.N  
/Cx = B.B.B  
/St = 2B.2B  
/D = 2H + 6.6.4.2.2 = 28  
/V = 6.6.6.4.4.4 = 24  
/NDV = 28 + 24 = 52.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip 74 88 26 29 30 59 25 35 29 35 58 36 35/27 21/29 220 196 222 638

Obs. : see at *E. nivaria*.

30. *Eltonella (Eltonella) tropidosauri* n. sp. Cl. n° 46.

a — Host : *Tropidosaura essexi*.
PT : ?
Loc. : Mont-aux-Sources (10.000 ft. al.), Drakensbergh Mts., Natal, S. Africa : Es.
Date : Jan. 1949.
Type material : Holotype n° LB/27656/S/1, in the Natal Museum (S. Africa), + 3 paratypes; these four specimens were discovered mixed in with *Euschoengastia origensis* Lawr., 1949, under the n° N.M. 4815.

b — Pl. Z, 1 to 8.

c — SIF = 6B.N.3.3111.100  
/Pp = (B)-(B)-(B).N.B  
/Cx = B.B.B  
/St = 2B.2B  
/D = 2H + 6.6.4.4.4.2 = 28  
/V = 6.6.6.2.4 = 24  
/NDV = 28 + 24 = 52.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip 74 88 26 29 30 59 25 35 29 35 58 36 35/27 21/29 220 196 222 638

Obs. : Differs from *E. montensis* in its longer body setae, its narrower scutum, its /Pp, and its finely barbed mastitarsala 3. This species might eventually be
considered a variation of *E. montensis*. Perhaps, among the material collected from *Tropidosaura essexi* and *T. cotrelli* on Mont-aux-Sources (NM, 4816 and 4815), some specimens belong to the species *tropidosauri*.

31. *Eltonella (Eltonella) montensis* (Lawrence, 1949). Cl. no 29.

= *Eutrombicula montensis* Lawrence, 1949 (46), Radford, 1954 (64).
= *Trombicula (Trombicula) montensis*, Wharton & Fuller, 1952 (82).
= *Trombicula* (Unallocated) *montensis*, Audy, 1954 (8).

a — Hosts: H: *Pseudocordylus subviridis*, *P. spinosus*, *Tropidosaura essexi*, *T. cotrelli*.

PT: ?

Loc.: Giant’s Castle, National Park, Champagne Castle and Mont-aux-Sources — Drakensberg Mts., Natal, S. Africa: Es.

Date: ?

Type material: Type in Natal Museum, Pietermaritzburg, Natal (S. Africa); no NM. 4808.

b — Pl. AA, 1 to 7.

c — SIF = 6B.N.3.3III.100  /Pp = (B)-(B)-(B).N.B  /Cx = B.B.B

/ST = 2B.2B  /D = 2H + 6.6.4.4.2.2 = 26  /V = 4.4.4.4u.4.2 = 22

NDV = 26 + 22 = 48.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip

75  95  28  29  29  58  25  30  33  53  30  31/22  19/27  243  208  235  696

Obs.: see *E. tropidosauri*.

32. *Eltonella (Eltonella) draconensis* (Lawrence, 1949). Cl. no 20.

= *Eutrombicula draconensis* Lawrence, 1949 (46), Radford, 1954 (64).
= *Trombicula (Trombicula) draconensis*, Wharton & Fuller, 1952 (82).
= *Trombicula* (Unallocated) * draconensis*, Audy, 1954 (8).

a — Host: H: *Pseudocordylus subviridis*.

PT: ?

Loc.: Mullers Pass (6 000 ft. alt.) Newcastle, Natal, S. Africa: Es.

Date: ?

Type material: Type no NM. 4828, in Natal Museum, Pietermaritzburg, Natal (S. Africa).

b — Pl. BB, 1 to 8.

c — SIF = 6B.N.3.3III.100  /Pp = (N)-(N)-(N).N.N  /Cx = B.B.B

/ST = 2B.2B  /D = 2H + 6.6.4.4.2 = 24  /V = 4.4.4.2u.2.4 = 20

NDV = 24 + 20 = 44.
Obs.: As for *E. dracornensis*, the scutal setae formula is AM>AL>PL; for any other *Eltonella* we have always : PL>AL. *E. gerrhosaui* differs from *E. dracornensis* in its scutum measurements.

35. *Eltonella (Eltonella) agamae* (Lawrence, 1949) ¹. Cl. n° 13.

= *Eutrombicula agamae* LAWRENCE, 1949 (46) [not *Thrombicula agamae* ANDRÉ, 1929 (31)], RADFORD, 1954 (64).

= *Trombicula* (*Trombicula*) lawrencei, WHARTON & FULLER, 1952 (nom. nov.) (82).

= *Eutrombicula* (Squamicola) lawrencei, AUDY & V.-G., 1961 (17).

a — Host : E : *Agama hispida armata* Peters, 1854.

PT : ?

Loc. : Weenen, Natal, S. Africa : Es.

Date : ?

Type material : Type n° NM. 4832 in Natal Museum, Pietermaritzburg, Natal (S. Africa).

b — Pl. HH, 9.

c — SIF = 6B.N.3.311.100 /Pp = (B)-(N)-(N).N.N /Cx = B.B.B

/ST = 2B.2B /D = 2H + 6.6.4.2.2 = 22 /V = 4.4.4.2u.2 = 16

NDV = 22 + 16 = 38.

Obs. : Differs from any other species in its scutal aspect.

36. *Eltonella (Eltonella) pachydactyli* (Lawrence, 1949). Cl. n° 32.

= *Eutrombicula pachydactyli* LAWRENCE, 1949 (46), RADFORD, 1954 (64).

= *Trombicula* (*Trombicula*) pachydactyli, WHARTON & FULLER, 1952 (82).

= *Eutrombicula* (Squamicola) pachydactyli, AUDY & V.-G., 1961 (17).

a — Host : H : *Pachydactylus laevigatus* laevigatus, *P. laevigatus* tessellatus.

PT : ?


Type material : Type T.M. 13 in Natal Museum, Pietermaritzburg, Natal (S. Africa).

b — Pl. EE, 1 to 8.

c — SIF = 6B.N.3.311.100 /Pp = (B)-(N)-(N).N.N /Cx = B.B.B

/ST = 2B.2B /D = 2H + 6.6.2.4.4.2 = 26 /V = 4.4.4.4u.2 = 18

NDV = 26 + 18 = 44.

¹. Original name restored following Rules of Nomenclature.
Obs. : Peculiar in its apically expanded solenidion on leg-tarsus 2; also in the considerable difference in scutul setae: AL (branched), and AM and PL (barbed). The sensillae are very graceful.


= *Trombicula (Trombicula) frittsi*, Womersley, 1952 (84), Wharton & Fuller, 1952 (82).

= *Trombicula (? ilesi-group) frittsi*, Audy, 1954 (9).

= *Eutrombicula (Eltonella) frittsi*, Audy, 1956 (11), Womersley & Audy, 1957 (85).

**Larva**

a — Hosts: H, Mr: Gehyra oceanica, Varanus indicus, Rattus praetor.

PT: ?

Loc.: Cape Torokina, Empress Augusta Bay, Bougainville Island, Australian Mandate: At.

Date: summer and fall, 1944.


b — Pl. FF, 8.

c — SIF = 6B.N.3.3111.100 /Pp = (B)-(N)-(N).B.B /Cx = B.B.B.

/St = 2B.2B /D = 2H + 6.6.4.2.2. = 22 /V = 4.4.4.4.4.2 = 18

NDV = 22 + 18 = 40.

Obs.: Smaller species than *E. tweediei*, differs also in its /Pp and in its actual shape.

**Nymph**

Note: The nymph of *T. (T.) frittsi*, described by Womersley in 1952 (84, p. 330), has to be considered as *E. (E.) eltoni*, following the corrigendum of Womersley and Audy in 1957 (85, p. 263). It has not come to our attention that *E. (E.) frittsi* was ever reared.

= *Eutrombicula* (*Microtrombicula*) Ewing, 1950 (33).

= *Microthrombidium* Oudemans, 1910 (55), 1912 (56), André, 1929 (3).

= *Trombicula* (*Microthrombidium*) Methlal, 1927 (53).


= *Otonyssus* Buitendijk, 1945 (23).

= *Trombicula* (*Eutrombicula*) Thor & Willmann, 1947 (72), Wharton & Fuller, 1952 (82).


= *Trombicula* (*Trombicula*) Wharton & Fuller, 1952 (83).


a — Hosts: B, H, M, Mch, Mr.

PT: Ears of B, M, Mr and Mch, intranasal of Mch and Mr, skin between squama of H.

Loc.: Tropical, subtropical and temperate regions, old and new World.


b — Pl. FF to ZZ, and AB to AV.

c — SIF = 6B2.2.2111.100 ST = + pSt = + PT' = + or- PT" = + or- jsp = 7.7.7 to 6.6.6 fCn = B.B.B to B1.N.N fSt = 2B.2B to 2N.2N Iph = 430-880.

Obs.: *Trombiculini* with either a punctate or a verrucose scutum, having anterolateral shoulders; palpal claw two-pronged; oculate.


= *Eutrombicula* (*Microtrombicula*) Ewing, 1950 (33).

= *Microthrombidium*, Oudemans, 1910 (55), 1912 (56), André, 1929 (3).

= *Trombicula* (*Microthrombidium*), Methlal, 1927 (53).


= *Otonyssus*, Buitendijk, 1945 (23).
= Trombicula (Eutrombicula), Thor & Willmann, 1947 (72), Wharton & Fuller, 1952 (82).
= Trombicula (Trombicula), Wharton & Fuller, 1952 (82).

Larva:
a — Hosts: B, M, Mch, Mr.
  PT: Ears; intranasal on Mch and Mr.
  Loc.: Tropical, subtropical and temperate regions, old and new world.
  Subgenerotype: Microthrombidium minutissimum Oudemans, 1910 (55).
b — Pl. JJ to ZZ, and AB to AV.
c — SIF = 6B.N.2.3.H.II.L.100  ST = +  pST = +  PT’ = + or — 
  PT" = + or —  fsp = 7.7.7 to 6.6.6  fCx = B.B.B to B1.N.N
  fSt = 2B.2B to 2N.2N  Ip = 430-880.

Obs.: Microtrombicula of small size with typical subpentagonal scutum, small and verrucopunctate; sensilla simple, bi- or tri-branched; galeal setae bare; palpal claw bifurcate; oculate.

Nymph:
a — Pupation period: 18 to 28 days.
b — Pl. AI, AK, AS, AT, AU.
c — fTn = 9B.3S  ASL/SB = 1.8 to 2.8  PGC : 2  PGS:1
  Hyp.: 2 (4N).
  Sens.: slender or slightly expanded, branched or barbed. fSt = 4 to 10 B.

Obs.: Body eight-shaped; appendages normally developed: IPn = 1000 to 1800.
  Idiosome whitish, no eye-spots.

Note: The subgenus Microtrombicula can be divided in two "groups":

(a) MINUTISSIMA-GROUP: with bi-furcate or bi-branched sensillae; or, with these exceptions to the rule, M. katangae, M. bukamae and M. nycteris having tri-furcate or tri-branched sensillae.

(b) VERRUCAEASUTA-GROUP: having simple whiplike sensillae. Generally the base, or peduncle, of the sensilla is covered with short and tiny barbs, or spicules.

On the bifurcate sensilla the splitting in two equal branches occurs at the half-length of the organel. On the tri-furcate sensilla, the proximal branch appears at the half-length also and is about a third the length of the main branch. The distal branch is born about half way between the proximal branch and the tip of the main branch, and its length is slightly less than that of the main branch.

The leg-tarsi also show an interesting character:

1) Leg-tarsus 1 always possesses a proximal internal ring of thickened scleroprotein commonly called "bar" (b); in almost all the Microtrombicula, one is able to observe
the existence of one, or two, half-rings or semi-bars (sb) reinforcing the ventral wall of the tarsus;

2) Leg-tarsus 2 has the same armature but only one semi-bar;

3) Leg-tarsus 3 is rarely provided with an extra-bar or semi-bar.

In conclusion one may write the "leg-tarsi bar formula" as follows:

- \( f_{BT} = (b)(2sb) - (b)(sb) - (b)(sb) \) as a maximum case,
- \( f_{BT} = (b)(sb) - (b) - (b) \) as a minimum case.

Chigger-mites preserved in alcohol for a long time, or "hyper-clarified" in lactophenol, are more difficult to be checked concerning their \( f_{BT} \). This is probably a reason that many authors never refer to that interesting taxonomic character.

(a) \textit{MINUTISSIMA-GROUP}.

1. \textit{Microtrombicula} (\textit{Microtrombicula}) \textit{minutissima} (Oudemans, 1910).

\[ [T] [Ts] [gr. T]. \text{Cl. n° 25.} \]

- \textit{Microthrombidium minutissinum} Oudemans, 1910 (55), 1912 (56), André, 1929 (3).
- \textit{Trombicula} (\textit{Microthrombidium}) \textit{minutissima}, Methlgl, 1927 (53).
- \textit{Trombicula minutissimum}, Radford, 1942 (59), Lawrence, 1949 (46), Fuller, 1952 (36).
- \textit{Otonyssus minutissimus}, Buitendijk, 1945 (23).
- \textit{Trombicula} (\textit{Eutrombicula}) \textit{minutissima}, Thor & Willmann, 1947 (72), Wharton & Fuller, 1952 (82).
- \textit{Eutrombicula} (\textit{Microtrombicula}) \textit{minutissima}, Ewing, 1950 (33).
- \textit{Trombicula} (\textit{Trombicula}) \textit{minutissimum}, Audy, 1954 (9).
- \textit{Eutrombicula minutissima}, Radford, 1954 (64).

a — Host : Mch : \textit{Hipposideros caffer}, \textit{Nycteris capensis}.

PT : Ears.

Loc. : Durban, and Bishopstone caves, Natal, S. Africa : Es.

Date : Jan. 1905.

Type material : Holotype in the Rijksmuseum of Leiden (Nat. Hist.), Holland.

b — Pl. KK, 1 to 5.

c — SIF = 6B.N.2.3III.100 \( f_{P\Phi} = (B)-(B)-(N).N.N' \)

\[ f_{C\chi} = B_3.N.B_2 \]

\[ f_{St} = 2B_1.2N \]

\[ f_{D} = 2H + 6.6.6.4.2.2 = 28 \]

\[ f_{V} = 4.4.4.6.4.2 = 24 \]

NDV = 28 + 24 = 52.

\begin{tabular}{lcccccccccc}
from & AW & PW & SB & ASB & PSB & SD & AP & AM & AL & PL \\
Type material & 33 & 45 & 15 & 24 & 23 & 47 & 27 & 28 & 26 & 26 \\
\textit{N. capensis} & 35 & 43 & 16 & 26 & 21 & 47 & 26 & 27 & 22 & 34 \\

columns & S & H & D & V & pa & pm & pp & Ip \\
Type material & 52 & 30 & 29/26 & 22/27 & 230 & 178 & 222 & 630 \\
\textit{N. capensis} & 56 & 34 & 30/25 & 20/25 & 240 & 197 & 223 & 660
\end{tabular}

\( (N. B. : \) Type material comes from \textit{H. caffer}).
Obs. : Not a very small species; differs from any other in having a scutum peculiar in its reticulate design which Oudemans pointed out very well in his sketches. Voluminous paired eyes. Dorsal leg setae provided with few branches: 1 to 4.

2. Microtrombicula (Microtrombicula) hexasternalis n. sp. Cl. n° II.

a — Host : Mch : Rousettus angolensis.
PT : ?
Date : ?
Type material : Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).
b — Pl. JJ, 1 to 4.
c — SIF = 6B.N.2.3III.100 /Ph = (B)-(B)-(N).N.N /Cx = Bg.N.N
/St = 2N.2N.2N /D = 2H + 10.6.6.8.6.8.4.2 = 48
/V = 6.6.6.2.6.6.4 = 42 NDV = 90.

Obs. : This species is peculiar in many respects:
1) 6 sternal setae, nude or nearly nude;
2) Dorsal setae shorter than the caudal; these and the ventrals having slender, elongate tips, often curling;
3) Dorsal leg setae also slender and curling, and bearing only a few short, delicate barbs;
4) Typical pentagonal scutum with a restricted reticulate zone;
5) Leg-tarsi 1 and 2 with one bar and two semi-bars, leg-tarsus 3 with one bar and one semi-bar; tarsal-bar formula : /Bl = b.2sb — b.2sb — b.sb.

3. Microtrombicula (Microtrombicula) audyi n. sp. Cl. n° 3.

= Trombicula batui Philip & Traub, 1950 (57), in part.

Note : In the original description of T. batui, the authors gave the measurements of five specimens : Holotype + 4 Paratypes. It is evident that batui is not a homogenous species. In fact, after careful study of different specimens — some of them kindly provided by Dr. J. R. Audy — one is able to distinguish two different species:
1) M. batui, the larger species with, as representative in the original collection, the Holotype n° 1865 and the Paratype n° 4 (n° 8011);
2) M. audyi n. sp., the smaller species (dedicated to Dr. J. R. Audy in friendship).
a — Hosts : Mch : *Eonycteris spelaea*.
PT : ?
Loc. : Batu Caves, Selangor, Malaya : Om.
Date : 20 March 1948.

b — Pl. KK, II to 15.

c — SIF = 6B.N.2.3III.100  
\[ f/P_p = (B)-(B)-(N^o).N.N \]
\[ f/C_x = B_y.N'.B_z \]
\[ f/\text{St} = 2B_2.2N' \]
\[ f/p = 7.7.6! \]
\[ f/D = 2H + 8.6.6.4.2 = 34 \]
\[ f/V = 4.4.2.6.6.6.4.2 = 34 \}
NDV = 68.

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Studied :

| Pt. ?-8oII | 37 | 44 | 18 | 22 | 20 | 42 | 26 | 26 | 20 | 29 |

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Studied :

| Pt. ?-8oII | 44 | 38 | 30/22 | 19/22 | 194 | 166 | 190 | 550 |

Obs. : Very small species (see *M. batui* n° 4, p. 75).

4. *Microtrombicula (Microtrombicula) ressleri* n. sp. Cl. n° 39.

a — Hosts : Mr : *Claviglis smithi*, " rodent " ?
PT : ears.
of Congo ; Pemba, Uganda, British East Africa : Ec and Ee.
Type material : Holotype n° 191053/C/1 in the Musée d’Afrique Centrale,
Tervuren, Belgium.

b — Pl. LL, I to 3, and AC.

c — SIF = 6B.N.2.3III.100  
\[ f/P_p = (B)-(B)-(B).N.B \]
\[ f/C_x = B_2.N.B_1 \]
\[ f/\text{St} = 2B_2.2N \]
\[ f/p = 6!6!6! \]
\[ f/D = 2H + 8.6.4.4.4.2 = 30 \}
\[ f/V = 4.4.6.4.4.4.2 = 28 \]
NDV = 58.

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| Kabunga | 35 | 32 | 23/13 | 17/18 | 19/20 | 156 | 126 | 151 | 437 |
| Pemba   | 40 | 30 | 20/17 | 19/20 | 156 | 126 | 140 | 428 |

Obs. : One of the smallest species, along with *M. verrucascuta*. 
Cl. no 49.

= Trombicula youhensis Abonnenc & Taufflieb, 1957 (1).

a — Host : Mr : Mastomys coucha.
PT : ears.
Date : 24 Jan. 1955.
Type material : Holotype no 24155 in Muséum Nat. Hist. Paris, France.

b — Pl. RR, 6.

c — SIF = 6B.N.2.311.100 /Pp = (B)-(N)-(B).N.N /Cx = B₄.N.B₆
/St = 2B.2Nf /Sp = 7.6.6 /D = 2H + (4.4).6.6.4.2 = 28
/V = 4.4.4.2.8.6 = 28 NDV = 56.

Obs. : Very small species; differs from the preceding in its /Pp, /Cx, /St, and /Ip.

6. Microtrombicula (Microtrombicula) hoogstraali (Radford, 1954). Cl. no 12

= Trombicula hoogstraali Radford, 1954 (64) (65).

a — Host : Mr : Rattus rattus rattus.
PT : ?
Loc. : Ta'izz, Yemen, Arabia : Ec.
Date : 1951.

b — Pl. LL, 4 to 8, and AD.

c — SIF = 6B.N.2.311.100 /Pp = (B)-(N)-(B).N.B /Cx = B₄.N.B₇
/St = 2B.2Nf /Sp = 6/6/6/6 /D = 2H + 8.6.4.6.4.2 = 32
/V = 6.4.4.4.6.4 = 28 NDV = 60.

Obs. : Very small species. Differs from the two preceding species in its body setation.

7. Microtrombicula (Microtrombicula) viverida n. sp. Cl. no 47.

a — Host : M : Genetta tigrina.
PT : ears.
Date: 30 May 1954.
Type material: Holotype no 30554/1 in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. LL, 9, 10, and AE.

c — SIF = 6B.N.2.3III.100 /Pp = (B)-(N)-(N).N.B /Cx = B₂,N,B₁ 
/Sl = 2B₁,2N /Sp = 7.6/6! /D = 2H + (4.4)6.4.4.2 = 26 
/V = 4.4.4.4.8u.6.4 = 34 NDV = 60.

Obs.: Differs, in its /Pp, from any other closely related species. Many dorsal setae on leg 3 are nude.

8. *Microtrombicula* (*Microtrombicula*) *pembae* n. sp. Cl. no 36.

= *M. pembaensis*, on slides.

a — Host: Mr: “rodent”? 
PT: ?
Date: Dec. 1955.
Type material: Holotype 578/V/1 in Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. LL, II.

c — SIF = 6B.N.2.3III.100 /Pp = (B)-(B)-(B).N.B /Cx = B₂,N,B₁ 
/Sl = 2N,2N /Sp = 7.7 /D = 2H + (4.4)6.4.4.2 = 34 
/V = 4.2.4.4.6u.4.2 = 26 NDV = 60.

Obs.: Differs from the preceding in its /Pp. Very elongate and slender anter-ventral setae (22 μ).


= *Trombicula* (*Microtrombicula*) *iecensis* TAUFFLIEB, 1960 (69).

a — Host: Mr: *Rattus frugivorus*.
PT: ears.
Date: 17 Sept. 1958.
Type material: Holotype in the Institut d’Études Centrafricaines, Brazzaville (Congo).
b — Pl. QQ, 11 to 15.

c — SIF = 6B.N.2.3III.100 /Pp = (B)-(B)-(B).B.B /Cx = B₂.N.B₁
/st = 2N'.2N /sp = 7.7.6 /D = 2H + (4.4).6.4.4.2 = 30
/V = 4.6.2.6.4.2 = 24  NDV = 54.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
36 46 18 21 22 43 20 21 21 30 41 35 25/22 21/24 174 146 172 492

Obs. : Differs slightly from M. brutsaerti, which could be a subspecies of iecensis.

10. Microtrombicula (Microtrombicula) scotophili n. sp.  Cl. n° 44.

a — Host : Mch : Scotophilus muricoflavus.
PT : ?
Loc. : Equatoria, Sudan, Africa : Ec.
Date : 2 March 1952.
Type material : Holotype n° 2198 in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. MM, 1 to 3.

c — SIF = 6B.N.2.3III.100 /Pp = (B)-(B)-(B).B.B /Cx = B₂.N'.B₃
/st = 2B₁.2N /sp = 7.6.6 /D = 2H + (4.4).6.6.6.4.2 = 34
/V = 4.4.4.6.6.4.2 = 32  NDV = 66.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
43 48 19 22 22 44 21 24 21 31 51 32 25/14 17/19 168 148 159 475

Obs. : Setae of body and appendages more heavily branched than those of M. brutsaerti.

II. Microtrombicula (Microtrombicula) brutsaerti n. sp.  Cl. n° 6.

a — Hosts : Mr : Claviglis smithi, Oenomys hypoxanthus.
PT : ears.
Date : 19 Oct. 1953.
Type material : Holotype n° 191053/K/1 in Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. MM, 12 to 14, and AF.

c — SIF = 6B.N.2.3III.100 /Pp = (B)-(B)-(B).B₁.B₂ /Cx = B₂.N.B₁
/st = 2B₁.2N /sp = 7.6.6 /D = 2H + 8.6.4.4.2.2 = 31
/V = 4.6.8.4.2 = 24  NDV = 56.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
37 45 18 21 23 44 21 21 20 28 42 36 27/22 19/22 178 147 170 495

I. Respectfully dedicated to the memory of Dr. Brutsaert, Professor of Parasitology at the Institute of Tropical Medicine, Prince Léopold, in ANVERS (Belgium).
Obs.: *M. brutsaerti* is very closely related to *M. scotophili* and *M. nyctinomi*, with regard to the scutum's shape and appearance. But in many other respects, differences are noticeable (body setation, *fPp*, *fCx*, *fSt*, *Ip*...).


= *Trombicula (Microtrombicula) nyctinomi* Taufflieb, 1960 (69).

a — Host : Mch : *Tadarida (Chaerephon) limbatus*.
PT : ears.
Date : 13 May 1955.
Type material : Holotype in the Institut d'Études Centrafricaines, Brazzaville (Congo).

b — Pl. QQ, 1 to 5.

c — SIF = 6B.N.2.3111.100  
*Pp* = (B)-(B)-(B).B.B  
*Cx* = B₄.N.N  
*St* = 2B₂₂B₂  
*Sp* = 7.6.6  
*D* = 2H + 10.6.4.6.4.2.2 = 36  
*V* = 6.6.6.6.6.2.2.2 = 32  
NDV = 68.

13. *Microtrombicula (Microtrombicula) heliosciuri* n. sp. Cl. n° 10.

a — Host : Mr : *Heliosciurus rufobrachium*.
PT : ears.
Date : 21 June 1954.
Type Material : Holotype n° 21654/1 in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. MM, 4 to 7.

c — SIF = 6B.N.2.3111.100  
*Pp* = (B)-(B₁)-(B₁).N.B₁  
*Cx* = B₄.N.B₁  
*St* = 2N.2N  
*Sp* = 6!6!6!  
*D* = 2H + (6.2).6.6.6.4.2 = 34  
*V* = 4.6.6.8.4.4.2 = 34  
NDV = 68.

Obs.: Closely related to *M. scotophili* and *M. brutsaerti*, but different in its dimensions.

Obs.: Differs from any other related species in its *fPp*, *fSt*, and in its longer PL.
14. Microtrombicula (Microtrombicula) mesopica n. sp.  Cl. n° 24.

a — Host : B : Mesopicus griseocephalus.

PT : ears.
Date : 18 May 1957 (coll. Dr. A. Fain).
Type material : Holotype n° 18557/V/1 in the Musée d’Afrique Centrale, Ter-
vuren, Belgium.

b — Pl. MM, 8 to II.

c — SIF = 6B.N.2.3111.100  \( fP\beta = (B)-(B_2)-(N^\prime).N^\prime \)  \( fC\chi = B_3.N.B_2 \)
   \( fSt = 2N^\prime.2N^\prime \)  \( f\phi = 7.6!6! \)  \( fD = 2H + (4.4).6.4.6.4.2 = 32 \)
   \( fV = 4.4.4.6.4.4 = 30 \)  NDV = 60.

Obs. : Differs from M. tamisci in its cheliceral rounded butting process whereas
																		
tamisci has its chelicera provided with a definitely pointed tooth (Pl. NN, 3).

15. Microtrombicula (Microtrombicula) tamisci n. sp.  Cl. n° 43.

This species is fairly wide-spread in Central Africa. There are representatives
all along the Great Graben from the Ituri (Northern Congo) to the Kivu-Maniema.
In the Southern Congo another closely related species : M. paraxeri, is found on
squirrels other than Tamiscus.

a — Hosts : Mr : Tamiscus boehmi, T. emini.

PT : ears.
Dr. Christy, 1912) ; Mongbwalu, Kibali-Ituri, Prov. Orientale (coll. Mrs.
Scheitz, 1938) ; all from Rep. of Congo, Africa : Ec.
Dates : 1899, 17 Nov. 1912, 7 March 1938.
Type material : Holotype n° 1899/V/1 in the Musée d’Afrique Centrale, Ter-
vuren (Belgium).

b — Pl. NN, I to 9.

c — SIF = 6B.N.2.3111.100  \( fP\beta = (B)-(B_1)-(B).N.B \)  \( fC\chi = B_2.N.B_1 \)
   \( fSt = 2N.2N \)  \( f\phi = 6!6! \)  \( fD = 2H + (6.2).6.4.4.4.2 = 30 \)
   \( fV = 4.4.4.6.4.4 = 30 \)  NDV = 60.

Kivu .....................  41  47  19  22  23  45  22  23  22  30
Stanleyville ..............  39  47  19  22  22  44  22  23  22  32
Fundi ...................  37  42  18  20  22  42  19  20  22  30
Mongbwalu ...............  39  44  18  22  24  46  21  23  24  30
Obs. : The holotype is a Kabambare (Kivu-Maniema) specimen (the most numerous: 107). Differs from *M. paraxeri* in its abundant body pilosity, also in its fPp, fCx and fSt.

16. *Microtrombicula (Microtrombicula) paraxeri* n. sp. Cl. n° 35.

This species is very closely related to *M. tamisci*. Two records from Katanga and one from Uélé (Northern Congo).

a — Hosts: Mr: *Paraxerus cepapi quotus*, *Anomalurus jacksoni jacksoni*, *Heliosciurus rhodesiae rhodesiae*.

PT: ears (audit. duct).


Type material: Holotype n° 28512/V/1 in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. NN, 10 to 14.

c — SIF = 6B.N.2.3 II 1.100


fSt = 2N'.2N /sP = 6!/6! /fD = 2H + (6.2).6.4.4.4 = 28

fV = 4.4.6.2.6u.4 = 26 NDV = 54.

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</table>

Obs. : The specimens from Uélé wear a branched external seta on the palpob- 

tibia, instead of a nude one. *M. paraxeri* differs from *M. tamisci* in its fPp, fCx and fSt. Both species possess a chelicera armed with a small, pointed subterminal tooth.

17. *Microtrombicula (Microtrombicula) katangae* n. sp. Cl. n° 18.

This species is closely related to the following, *M. bukamae*. They differ in only the general dimensions and the body setation.

a — Host: Mr: *Heliosciurus rhodesiae rhodesiae*.

PT: ears.
18. *Microtrombicula (Microtrombicula) bukamae* n. sp. Cl. n° 7.

**a — Host:** Mr : *Heliosciurus rhodesia rhodesia*.

PT : ears.


**Type material:** Holotype n° 301255/B/1 in the Musée d’Afrique Centrale, Tervuren (Belgium).

**b — Pl. OO, 5 to 7.**

**c — SIF = 6B.N.2.3111.100 /Pp = (B)-(B2)-(B).N.B /Cx = B3.N".B3 /St = 2B2.2N' /sp = 7.616! /D = 2H + (6.4).6.4.4.4.2 = 32 /V = 6.4.6.6.6.2u.2.2.2 = 30 NDV = 62.**

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip 48 50 20 22 22 44 21 32 26 32 51 36 28/23 20/23 187 154 183 524

**Obs.** : Differs from *M. bukamae* in the larger and more barbed setae on body and appendages. Sensillae are always tri-furcate.

19. *Microtrombicula (Microtrombicula) lawrencei* n. sp. 1. Cl. n° 20.

**a — Hosts:** M : *Procavia capensis natalensis*.

PT : ?

**Loc.** : Darde, Natal, South Africa : Es.

**Date:** Sept. 1951 (coll. Dr. Lawrence ; n° N.M.-5716).

**Type material:** Holotype in Museum of Natal, Pietermaritzburg, S. Africa.

**b — Pl. OO, 1 to 4.**

1. Species respectfully dedicated to Dr. R. F. LAWRENCE, Director of the Natal Museum.
20. *Microtrombicula (Microtrombicula) phoeniculi* n. sp. Cl. n° 37.

a — Host: B: *Phoeniculus bolley*.
PT: ?
Date: 26 Aug. 1956 (coll. Dr. A. Fain).
Type material: Holotype n° 26856/1 in the Musée d'Afrique Centrale, Tervuren (Belgium).

b — Pl. PP, 1 to 5.

c — SIF = 6B.N.2.3III.100 /FPp = (B)-(B)-(B).B.B /FCx = B₂.N.N₅
/FS = 2B₂.2N⁺ /Fsp = 7.6.6. /FD = 2H + 8.6.6.4.4.2 = 32
/FV = 4.6.6.8u.4.2 = 38 NDV = 70.

*Obs.:* Differs from any other species in its /FPp, /FCx, /FS and body pilosity.

Cl. n° 40.

= *Trombicula (Trombicula) rodhaini*, Audy, 1954 (9).
= *Eutrombicula rodhaini*, Abonnenc & Taufflieb, 1957 (i).

a — Hosts: Mr: *Lophuromys aquilus, Dasymys bentleyae*.
PT: ears.
Type material: Holotype in the Musée d'Afrique Centrale, Tervuren (Belgium).

b — Pl. PP, 6 to 10 and AG.

c — SIF = 6B.N.2.3III.100 /FPp = (B)-(B)-(B).B.B /FCx = B₂.N⁺.B₁
/FS = 2B₂.2N⁺ /Fsp = 7.7.7 /FD = 2H + 8.6.4.6.4 = 30
/FV = 4.4.2.6u.2.6.6 = 30 NDV = 60.
Obs.: Differs from any other species in its general dimensions, body setation, fPp, fCx and fSt.

22. Microtrombicula (Microtrombicula) batui (Philip & Traub, 1950).
Cl. n° 4.

= Trombicula (Trombicula) batui, Wharton & Fuller, 1952 (82), Audy, 1954 (9), Womersley & Audy, 1957 (85).

As already seen above, the species described as T. batui actually involved two species; a smaller one named M. audyi, and a larger one which keeps the name of M. batui because the holotype, designated by Philip and Traub, corresponds to the larger species.

da — Hosts : Mch : Eonycteris spelaea "bat ?".
   PT : ?
   Loc. : Batu Caves and Pulau Angra (near Kuala Lumpur), Selangor, Malaya : Om.
   Type material : Holotype n° 1854 in U.S. Natl. Museum, Washington D.C., USA.

b — Pl. PP, II to I5.

c — SIF = 6B.N.2.3III.100 fPp = (B)-(B)-(B).N.B fCx = B3.N.N4
   fSt = 2B3,2N7 fSp = 7.7.7 fD = 2H + 8.8.6.6.4.4.2 = 40
   fV = 4.4.4.4.6.8.8.4.2 = 44 NDV = 84.

Obs. : The famulus 2 (microtarsala 2) is situated, unusually, in front of the sole­nidion (striated spur). The setae are slender and their apices end imperceptibly; but this is the case in a great number of Microtrombicula. The papal claws are long and slender also, and the chelicerae possess a dorso-subterminal butting process. The two humeral setae are fairly long (see Pl. PP, I5 H).
23. *Microtrombicula (Microtrombicula) paralumsdeni* n. sp. Cl. n° 34.

=Eutrombicula lumsdeni= RADFORD, 1953 (63) in part.

*Notes*: *Eutrombicula lumsdeni*, as described by RADFORD, is rather different from the specimen described presently and which he sent to me as a paratype of *E. lumsdeni*.

a — Host: M: *Procavia abyssinica meneliki*.
  PT: ?
  Date: 1952.
  Type material: Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. RR, 1 to 5.

c — SIF = 6B.N.2.311.100 /Pp = (B)-(B)-(B).B.B /Cx = B₂N.B₃
  /St = 2N².2N² /Sp = 7.6661 /D = 2H + 8.6.6.4.4.2 = 38
  /V = 6.8.6.6.8.4.4 = 42 NDV = 80.

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<tr>
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<td>41</td>
<td>33/26</td>
<td>23/26</td>
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<td>190</td>
<td>218</td>
<td>640</td>
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</table>

*Obs.*: After *M. nycteris*, this species is the largest in the *minutissima*-group (Ip 640), also its scutum covers a surface nearly as extensive as the scutum of *M. major* (Pl. AB, 7). The body setae are covered with tiny, slender barbs. The dorsal setae of the legs are slender and possess only rare and tiny barbs; these setae are very similar to the homologue, with curling tips, in *M. hexasternalis*. The sensillae are tri-furcate as in *M. katangae* and *M. bukamae*.


a — Host: Mch: *Nycteris macrotis*.
  PT: ears.
  Loc.: Nyumba caves, Nyanza (nr. Astrida), Rwanda-Burundi, Africa: Ee.
  Date: 13 Nov. 1955 (coll. Dr. A. Fain).
  Type material: Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. QQ, 6 to 10.
c — SIF = 6B.N.2.3III.100 /Pp = (N)-(N)-(N).N.N /Cx = B1.N.B2
/Sl = 2N.2N /Sp = 7.7.6! /D = 2H + 6.6.4.2.2 = 26
/V = 4.4.4.4a.4.2 = 22  NDV = 48.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
40 41 21 25 23 48 27 32 20 34 61 40 35/29 27/29 231 196 223 650

Obs. : Differs from any other species of the minutissima-group in its bare palpo-femoral setae and its /Pp. On 76 specimens, two sensillae are tri-furcate, all the others having two branches. The leg-tarsi 1 and 2 have strong and fairly long solenidions.

(b) verrucascuta-group, V.-G. & Audy, 1956 (77).

This group is characterised by having undivided, simple and whiplike sensillae. Almost all have the proximal half of their sensillae covered with tiny, nearly imperceptible barbs. M. nasalis, M. wrenni and M. ornata possess fine branches on the distal half of their sensillae.

The largest species : M. major (Ip 864) has, unusually, trifurcate palpal-claws. M. merrihewi and M. armata are the only two species with punctate instead of verrucose scuta.

Eight species are bat parasites, and three of these are intranasal : M. nasalis, M. wrenni and M. intranasalis ; but M. irangiensis, studied here for reasons of convenience, belongs to the minutissima-group in having furcate sensillae.

25. Microtrombicula (Microtrombicula) verrucascuta n. sp. [gr. T]. Cl. no 46.

Larva :

a — Hosts : Mr : Lophuromys aquilus, Dasymys bentleyae.

PT : ears.


Type material : Holotype no 12254/C/1 in the Musée d’Afrique Centrale, Ter- vuren (Belgium).

b — Pl. YY, 5 to 7, and AH.

c — SIF = 6B.N.2.3III.100 /Pp = (B)-(B)-(N).B1.B /Cx = B4.N.B5
/Sl = 2B.2B1 /Sp = 7.6.6 /D = 2H + 6.6.6.4.2 = 36
/V = 6.6.4.4.6.6.2.2 = 36  NDV = 68.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
26 33 12 20 17 37 22 16 16 22 17 28 25/20 15/20 154 125 145 424

Obs. : Very small species. Differs from M. kawaensis in having dorsal setae devoid of insertion shield, from M. lophuromyia in the nature of its /Cx and /St, from both and also from M. vanhoofti in having only 6 setae, instead of 8, on the first dorsal row.
NYMPH:

a — Host : Mr : *Lophuromys aquilus*.
Larva date : 12 Feb. 1954.
Ref. material : Specimens in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. AI, I & 2.

c — $fTn = 9B.3S$ ASL/SB = 1.8 PGC : 2 PGS : 1 Hyp. = 2 (4N)
$fSt = 4B$ to 6B.
Sens. : SP = 53 (covered with short thin barbs), SA = 55 (16 branches of $\frac{13}{\mu}$).
CL = 35 CA = 18 BL = 88 BH = 32 pCS = 7 to 10 (on each side of the crista).

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<td>$P_2$</td>
<td>$P_3$</td>
<td>$P_4$</td>
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<td>TH</td>
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<td>23/35</td>
<td>91</td>
<td>47</td>
<td>70</td>
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</tr>
</tbody>
</table>

Obs. : Very small species.

26. *Microtrombicula* (*Microtrombicula*) armata n. sp. Cl. no 2.

a — Host : Mch : *Miniopterus scheibersi*.
PT : ?
Loc. : Rooibergh, Transvaal, S. Africa : Es.
Date : 27 July 1961 (coll. Dr. Zumpt).
Type material : Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. SS, and TT, to & II.

c — $SIF = 6B.N.2.2111.100$ $fPp = (B)-(N)-(N).N.N$ $fCx = B.B.B$
$fSt = 2B_4.2B_3$ $fsp = 7.7.7$ $fD = 2H + (6.6).(6.2).6.4.2 = 34$
$fV = 6.4.6.6.6.6.4u.4.2 = 44$ NDV = 78.

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<td>S</td>
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<td>D</td>
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<td>Ip</td>
<td>PT' = +</td>
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<td>160</td>
<td>438</td>
<td>PT* = —</td>
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Obs. : Differs in many respects from any other species. Paired eyes very small, the first lens on the PL's line. Chelicerae small, armed with a powerful dorsal tooth. Pretarsala 1 present, but pretarsala 2 absent. Dorsal setae with few short barbs.
Ventral setae with one to three branches, like the leg setae. Leg-tarsus 3 with three mastitarsalae. The anal pore with a lip pointed backwards (see Pl. SS).

27. Microtrombicula (Microtrombicula) irangiensis n. sp. Cl. n° 15.

a — Host : Mch : *Hipposideros caffer*.
PT : ears.
Date : 14 Aug. 1956 (coll. Dr. A Fain).
Type material : Holotype n° 14856/V in the Musée d’Afrique Centrale, Ter- 
vuren (Belgium).

b — Pl. TT, 1 to 7.

c — SIF = 6B.N.2.3111.100  jPp = (B)-(B)-(N).N.B  jCx = B₄.N.B₂
ʃS = 2B₂.2N  jŚp = 7.66!  jD = 2H + 6.6.4.6.4.2 = 36
ʃV = 4.4.4.8.6.2 = 34  NDV = 70.

Obs. : Despite the fact that the sensillae of this species are furcate, and, in that respect, it belongs to the *minutissima*-group, nevertheless, its study position is — without any doubt — near *M. armata* and *M. uchidai*. *M. irangiensis* differs from any closely related species in its big and strongly armed chelicerae (fig. 1), its fairly long solenidion 1 is double the length of solenidion 2 (character often seen on bat trombiculids). Its mastitarsalae 3 possesses two slender branches. Its paired eyes are more voluminous than those of *M. armata* and approximately the same as those of *M. uchidai*. Its Ip = 484 shows a definitely small species.

28. Microtrombicula (Microtrombicula) uchidai (Kamo et al, 1957). Cl. n° 44.

= Trombicula uchidai Kamo, Kawashima & Nishimura, 1957 (45).

a — Host : Mch : *Miniopterus schreibersi fuliginosus*.
PT : ?
Loc. : Cave of Iwarayama (copper mine), Maebaru-machi, Itoshima-gun, 
Fukuoka Prefecture, Kyushu, Japan : Pa.
Date : 21 Apr. 1957 (coll. Mr. T. Uchida).
Type material : Holotype in Kyushu University (Medical parasitology Dpt.) 
(Japan).

b — Pl. UU, 1 to 5, and TT, 8 & 9.

ʃS = 2N.2B₂  jŚp = 7.77  jD = 2H + (8.2.4).(6.2).6.4.2 = 36
ʃV = 6.4.4.2.4.4.2 = 36  NDV = 62.
Obs.: The body setae are very slender, with endings difficult to see even with phase-contrast equipment. This situation is reflected in the measurement differences. The body and leg setae are provided with few barbs or branches. The PT is not nude as usual (fig. 4, pm). The chelicera has a butting, not hooklike, dorsal tooth. The two palpi are long and powerful and provided with strong, bifurcate claws (fig. 3). AM and AL are nude, and the PLs have only two barbs. The sensillae are entirely bare (fig. 5, AM, AL, PL & S).

29. Microtrombicula (Microtrombicula) intranasalis n. sp. Cl. n° 14.

= Microtrombicula (Microtrombicula) intranasalis intranasalis n. ssp.
= Microtrombicula (Microtrombicula) intranasalis tadarida n. ssp.

a. Microtrombicula (Microtrombicula) intranasalis intranasalis n. ssp.

a — Host : Mch : Nyctinomus sp.

PT : nasal fossae.

Loc. : Nyakibanda (near Astrida), Rwanda-Burundi, Africa : Ee.

Date : 15 May 1953 (coll. Dr. A. Fain).

Type material : Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. VV, 1 to 7.

c — SIF = 6B.N.2.2l1i.100  j/Pb = (B)-(B)-(B1).N.Ba  j/Cx = B.B.B

j/St = 2B.2B  j/sb = 7,6!6!  j/D = 2(2H) + (4,6)(6,6)4.4.4.4.2 = 44

j/V = (4,6,6)6,6.4.4.2 = 38  NDV = 82.

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<td>21/20</td>
<td>20/24</td>
<td>182</td>
<td>156</td>
<td>178</td>
<td>516</td>
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</table>

Obs.: Smaller than the ssp. tadarida. Scutum smaller and clothed with poorly barbed setae. Body setae and leg setae also less barbed. Strong palpal-claws, prongs deeply divided.

b. Microtrombicula (Microtrombicula) intranasalis tadarida n. ssp.

a — Host : Mch : Tadarida mops angolensis.

PT : nasal fossae.

Loc. : Akanyaru, Rwanda-Burundi, Africa : Ee.
Date: 27 Aug. 1955 (coll. Dr. A. Fain).

Type material: Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. VV, 12 to 18.

c — SIF = 6B.N.2.2III.I00  fP φ = (B)-(B)-(B)  fCx = B.B.B
               fSt = 2B.2B  fSp = 7.7.7  fD = 2(2H) + (6.6)6.6.4.4.2 = 44
               fV = (8.8)6.4.4u.6.2 = 38  NDV = 82.

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<td>21/27</td>
<td>206</td>
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<td>PT&quot; = +</td>
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Obs.: Larger than the former. Scutum larger, setae with more barbs. Body and leg setation more generously barbed. Strong palpal claw with deeply divided prongs.


= Microtrombicula nasalis Loomis, 1963 (50).

a — Host: Mr: Peromyscus eremicus.

PT: nasal fossae.

Loc.: Joshua Tree N.M., Riverside Co., California, USA: Ns.

Date: 9 Feb. 1962.

Type material: Holotype in Long Beach State College, Long Beach, Calif. (USA).


c — SIF = 6B.N.2.2III.I00  fP φ = (B)-(B)-(N)  fCx = B.B.B
               fSt = 2B.2B  fSp = 7.7.7  fD = 2H + (8.4)(6.4)6.4.4 = 38
               fV = 6.6.6.6.4u.4.2 = 40  NDV = 78.

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<td>176</td>
<td>210</td>
<td>596</td>
<td>PT&quot; = +</td>
<td></td>
</tr>
</tbody>
</table>

Obs.: Sensilla with two accessory branches. No pretarsala on leg-tarsus 2 (PT" = —). Strong palpal-claws, straight. Leg setae with few short barbs; two setae, distal to the mastitarsala 3, are nude, like two supplementary mastitarsalae.

= Microtrombicula wrenni Loomis, 1963 (50).

a — Host : Mr : Peromyscus eremicus.
PT : nasal fossae.
Loc. : Joshua Tree, N.M., Riverside Co., California, USA : Ns.
Date : 9 Feb. 1962.
Type material : Holotype in Long Beach State College, Long Beach, Calif. (USA).


c — SIF = 6B.N.2.1111.100  fPp = (B)-(B)-(B).N.B  fCx = B.B.B
fSt = 2B.2B  fSp = 7.7.7  fD = 2H + (10.8)(4.4)6.4.2.2 = 42
fV = 8.8.6.8.6.4.4.4.2 = 50   NDV = 92.

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<th>SD</th>
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<td>24</td>
<td>25</td>
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<td>38</td>
<td>28</td>
<td>21</td>
<td>45</td>
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<tr>
<td>68</td>
<td>64</td>
<td>42/36</td>
<td>30/40</td>
<td>274</td>
<td>256</td>
<td>314</td>
<td>744</td>
<td>PT'' = —</td>
<td></td>
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</table>

Obs. : Sensilla with 10 to 12 branches. No pretarsala on leg-tarsus 2 (PT'' = —). Strong, curved palpal-claws. Scutum larger than, but very close in shape to that of M. ornata.

32. Microtrombicula (Microtrombicula) merrihewi (Loomis & Lipovsky, 1954). Cl. no 23.

= Trombicula merrihewi Loomis & Lipovsky, 1954 (51).
= Microtrombicula merrihewi, Loomis, 1963 (50).

LARVA :

a — Host : Mich : Tadarida mexicana.
PT : ears.
Loc. : Merrihew Cave (6 miles S. and 2 miles W. of Aetna, Kansas), in Woods County, Oklahoma, USA : Nc.
Date : 24 Aug. 1948.
Type material : Holotype no 3472 in the Snow Entomological Museum, University of Kansas (USA).

b — Pl. WW, 1 to 5.

c — SIF = 6B.N.2.3111.100  fPp = (B)-(B)-(N).B.B  fCx = B.B.B
fSt = 2B.2B  fSp = 7.7.7  fD = 2H (8.4)6.4.6.4.2. = 36
fV = 4.6.4.4.6.4.4.2 = 34   NDV = 70.
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<td>43</td>
<td>24</td>
<td>28</td>
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<td>49</td>
<td>24</td>
<td>24</td>
<td>17</td>
<td>18</td>
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<tr>
<td>V.-G.</td>
<td>33</td>
<td>38</td>
<td>15</td>
<td>25</td>
<td>15</td>
<td>40</td>
<td>24</td>
<td>24</td>
<td>18</td>
<td>21</td>
</tr>
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<td></td>
<td>S</td>
<td>H</td>
<td>D</td>
<td>V</td>
<td>pa</td>
<td>pm</td>
<td>pp</td>
<td>Ip</td>
<td></td>
<td></td>
</tr>
<tr>
<td>L. &amp; L</td>
<td>46</td>
<td>44</td>
<td>22/21</td>
<td>18/22</td>
<td>—</td>
<td>—</td>
<td>—</td>
<td>PT' = +</td>
<td></td>
<td></td>
</tr>
<tr>
<td>V.-G.</td>
<td>46</td>
<td>46</td>
<td>24/35</td>
<td>24/32</td>
<td>200</td>
<td>168</td>
<td>194</td>
<td>562</td>
<td>PT&quot; = —</td>
<td></td>
</tr>
</tbody>
</table>

**Obs.** : Small scutum, punctate instead of verrucose. Small chelicera, curved and armed with a dorso-subterminal hooklike tooth. Very strong palpal-claws, with the two prongs deeply divided. Apex of solenidion 1 sharply pointed. Setae with long and slender nearly imperceptible endings (body and legs) (fig. 5). Pretarsala 2 absent (PT" = —).

**Nymph** :

a — Host : Mch : *Tadarida mexicana*.
   Loc. : Same locality and date as the original type material (larvae).
   Larva date : 24 Aug. 1948.
   Emerg. dates : ?

b — Pl. AU, 1 to 8.

c — fTn = 9B.3S  ASL/SB = 2.4  PGC = 2  PGS = 1  Hyp. = 2 (4N)  fSt = 3 or 4.
   Sens. : SP = 23 (short, fine barbs)  SA = 37 (subclavate, barbed).
   CL = 33  CA = 13  BL = 77  BH = 28
   pCS = 2 or 3 (on each side of the crista).

<table>
<thead>
<tr>
<th></th>
<th>ASL</th>
<th>PSL</th>
<th>CTL</th>
<th>SB</th>
<th>S</th>
<th>T</th>
<th>IL</th>
<th>PW</th>
<th>OW</th>
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<td>60</td>
<td>20</td>
<td>480</td>
<td>175</td>
<td>188</td>
<td>152</td>
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<tr>
<td>316</td>
<td>222</td>
<td>218</td>
<td>244</td>
<td>1000</td>
<td>10/14</td>
<td>69</td>
<td>37</td>
<td>62</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Obs.** : Differs from any other species in its measurements and tiny body setae.

   Cl. n° 32.

= *Trombicula ornata*, Loomis & Lipovsky, 1954 (52).
= *Microtrombicula ornata*, Loomis, 1963 (50).

**Larva** :

a — Hosts : Mr : *Neotoma micropus*, *Peromyscus leucopus*, *P. maniculatus*.
   PT : ears and body.
   Loc. : 4 miles S. of Aetna, Barber County, Kansas, USA : Nc.
   Dates : 11 and 14 Apr. 1949.
   Type material : Holotype n° 3401 in Snow Entom. Museum, Univ. of Kansas (USA).
b — Pl. WW, 6 to 10.

c — SIF = 6B.N.2.2111.100 \( fP\phi = (B)-(B)-(N).N.B \) \( fC = B.B.2B \)
\( fST = 2B.2B \) \( f\phi = 7.7.7 \) \( fD = 2H + (8.4)8.6.4.4 \) = 36
\( fV = 6.6.6.6.6.6.2 = 38 \) \( NDV = 74. \)

<table>
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<th>AW</th>
<th>PW</th>
<th>SB</th>
<th>ASB</th>
<th>PSB</th>
<th>SD</th>
<th>AP</th>
<th>AM</th>
<th>AL</th>
<th>PL</th>
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<tr>
<td>L. &amp; L. .....................</td>
<td>35</td>
<td>48</td>
<td>21</td>
<td>24</td>
<td>25</td>
<td>49</td>
<td>31</td>
<td>29</td>
<td>23</td>
</tr>
<tr>
<td>V.-G. .....................</td>
<td>32</td>
<td>48</td>
<td>21</td>
<td>26</td>
<td>26</td>
<td>52</td>
<td>35</td>
<td>30</td>
<td>25</td>
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</tbody>
</table>

S H D V pa pm pp Ip

L. & L. ..................... 66 50 29/31 18/29 — — — — PT\( ' = + \)
V.-G. ..................... 66 42 30/24 24/40 206 188 210 604 PT\( * = — \)

Obs. : Sensilla with four distal branches. Two (sometimes three) branched setae on coxa 3. Chelicera with a dorso-subterminal buntlike process. Pretarsala 2 absent (PT\( * = — \)).

**Nymph** :

a — Host : *Neotoma micropus*.

Loc. : same as the larva (type material).

Larva date : II Apr. 1949.
Emerg. dates : ?

b — Pl. AU, 9 to 16.

c — fTn = 9B.3S \( ASL/SB = 2.5 \) \( PGC = 2 \) \( PGS = 1 \) \( Hy\phi = 2 \) (4N)

<table>
<thead>
<tr>
<th>S</th>
<th>H</th>
<th>D</th>
<th>V</th>
<th>pa</th>
<th>pm</th>
<th>pp</th>
<th>Ip</th>
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<tbody>
<tr>
<td>L. &amp; L. .....................</td>
<td>66</td>
<td>50</td>
<td>29/31</td>
<td>18/29</td>
<td>—</td>
<td>—</td>
<td>—</td>
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<tr>
<td>V.-G. .....................</td>
<td>66</td>
<td>42</td>
<td>30/24</td>
<td>24/40</td>
<td>206</td>
<td>188</td>
<td>210</td>
</tr>
</tbody>
</table>

Obs. : Differs from the closely related species in its measurements.

34. *Microtrombicula (Microtrombicula) kanye* n. sp. Cl. n° 17.

a — Host : Mch : *Tadarida bocagei*.

PT : ?

Loc. : Kanye, Betchouanaland, S. Africa : Es.

Date : 24 Oct. 1957 (coll. Dr. Zumpt).

Type material : Holotype in the Musée d'afrique Centrale, Tervuren (Belgium).

b — Pl. WW, II to 15.
35. **Microtrombicula (Microtrombicula) kawaensis** n. sp. Cl. n° 19.

a — Host : Mr : *Lophuromys sikapusi sikapusi*.
PT : ears.
Date : 1957.
Type material : Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. XX, 1 to 5.

c — SIF = 6B.N.2.2III.100 /Pp = (B)-(B)-(N).N.B /Cx = B.B.B
/St = 2B.2B /sp = 7.7.7 /D = 2H + 6.6.8(2.4)6.4.2 = 38
/V = (2.6)7.4.6.4.4.4.4.2 = 38 \( NDV = 76. \)

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
27 37 15 19 21 40 27 20 18 25 40 36 21/20 18/20 188 160 174 522

Obs. : Species between *M. intranasalis* and *M. merrihewi*. Palpus and palpal-claw smaller but chelicera larger than in *M. merrihewi*. Scutal setae with 3 or 4 long branches. Solenidion 1 with a sharply pointed apex, like on *M. merrihewi*.

36. **Microtrombicula (Microtrombicula) lophuromyia** n. sp. Cl. n° 21.

a — Host : Mr : *Lophuromys aquilus*.
PT : ears.
Date : 6 Oct. 1957 (coll. Mr. Sadin).
Type material : Holotype n° 61057/V in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. XX, 11 to 15.

c — SIF = 6B.N.2.2III.000 /Pp = (B)-(B)-(N).B.B /Cx = B.N.B
/St = B.N /sp = 66.66 /D = 2H + 8.6.6.6.4.2 = 34
/V = 6.4.4.6.4.6.4 = 34 \( NDV = 68. \)

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
29 34 12 20 18 38 22 17 15 24 26 30 25/18 15/20 156 130 149 435
**Obs.**: Very similar to *M. kawaensis*, *M. vanhoofi* and *M. verrucascuta*. Differs from the first in having only two genualae 1, no large, circular insertion plates for the dorsal setae, and no mastitarsala 3. From the second in its different pilosity, and in the thinner aspect of its leg-tarsus solenidions 1 and 2. From the last one in its general measurements, its setation in general, and the exceptional absence of nude mastitarsala 3.

37. **Microtrombicula (Microtrombicula) vanhoofi n. sp.** Cl. n° 45.

**Larva**:

a — Hosts: Mr: *Praomys* sp., *Oenomys hypoxanthus*, *Rattus rattus alexandrinus*. PT: ears.


Dates: 19 Feb., 27 Feb. and 19 Mar. 1954 (coll. Dr. Pierlot, Mr. Lorge & Mr. Sadin).

Type material: Holotype n° 19254/C/1 in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. YY, 1 to 4.

c — SIF = 6B.N.2.3111.000 /Pp = (B)-(B)-(B).N.B /Cx = B.N.B

/F = 2B.2B1 /Sp = 7.6.6 /D = 2H + 8.6.6.6.4.2 = 34

/V = 6.6.4.2.4.4u.4.2 = 32 NDV = 66.

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<th>AM</th>
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<td>34</td>
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<td>24</td>
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<tr>
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<td>31</td>
<td>36</td>
<td>14</td>
<td>20</td>
<td>18</td>
<td>38</td>
<td>22</td>
<td>19</td>
<td>18</td>
<td>23</td>
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<tr>
<td>Mush.</td>
<td>30</td>
<td>35</td>
<td>13</td>
<td>20</td>
<td>18</td>
<td>38</td>
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<td>32</td>
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<td>17/19</td>
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<td>135</td>
<td>157</td>
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<td>31</td>
<td>27/21</td>
<td>17/21</td>
<td>176</td>
<td>144</td>
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<td>482</td>
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<tr>
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<td>32</td>
<td>27/19</td>
<td>17/19</td>
<td>174</td>
<td>139</td>
<td>159</td>
<td>472</td>
</tr>
</tbody>
</table>

**Obs.**: Differs from the preceding species in having 3 genualae on leg 1, another /Pp and /St; from *M. verrucascuta* in having other /Pp, /Cx, /St and /D, and no mastitarsala 3.

**Nymph**:

a — Host: *Praomys* sp.

Loc.: Lwiro.

Larva date: 19 Feb. 1954.

---

1. This species is respectfully dedicated to the memory of Prof. Dr. Van Hooof, my esteemed master, Chief-Physician in the Belgian Congo and Director of the Institute of Tropical Medicine of Anvers (Belgium).
Emerg. dates: 4, 7, 8, 9, 12 and 15 Mar. 1954; pupation period: 16 to 25 days.

Ref. material: Specimens in the Musée d'Afrique Centrale, Tervuren (Belgium).

b — Pl. AK, 1 to 4.

c — $fTn = 9B.3S$  $ASL/SB = 2.1$  $PGC = 2$  $PGS = 1$

$fSt = 4B.$  $Hyp. = 2 (4N)$

Sens.: $SP = 38$ (apparently nude)  $SA = 66$ (many short branches, 9 µ).

$CL = 46$  $CA = 26$  $BL = 85$  $BH = 37$

$PCS = 8$ to $10$ (on each side of crista).

Obs.: Very small species; differs from $M. verrucascuta$ in its ASL/SB ratio and its sensillae, also in its body setae.

38. Microtrombicula (Microtrombicula) seiurieola n. sp. Cl. no 41.

a — Host: Mr: Sciurus sp.

PT: ears.


Date: 30 Jul. 1957 (coll. Mr. G. Sadin).

Type material: Holotype n° 30757/V/1 in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. XX, 6 to 10.

c — $SIF = 6B.N.2.3111.000$  $fPp = (B)-(B)-(N).B.B$  $fCx = B.B.B.$

$AW$  $PW$  $SB$  $ASB$  $PSB$  $SD$  $AP$  $AM$  $AL$  $PL$  $S$  $H$  $D$  $V$  $pa$  $pm$  $pp$  $Ip$

35  45  20  27  23  35  28  40  60  41  38/30  25/32  224  186  218  628

Obs.: Very similar to the two preceding species as regards the shape of the scutum, but larger in size. No nude mastitarsala 3. Chelicera with a dorso-subterminal butting tooth. Setae covered abundantly with long barbs (fig. 8).

39. Microtrombicula (Microtrombicula) alexandrina n. sp. Cl. n° 1.

a — Host: Mr: Rattus rattus alexandrinus.

PT: ears.


Date: 19 Mar. 1954 (coll. Mr. Lorgé).

Type material: Holotype n° 19354/1 in the Musée d’Afrique Centrale, Tervuren (Belgium).
b — Pl. YY, 12, and AL.

c — SIF = 6B.N.2.3III.100  \( fPp = (B)-(B)-(B).B.B \)  \( fCx = B.N.B \)

\[ fSt = B.B \]
\[ fSf = 7.6!6! \]
\[ fD = 2H + 6.6.6.6.4.2 = 36 \]
\[ fV = 6.6.2.4.6.4.2 = 32 \]
\[ NDV = 68. \]

\text{Obs. :} Very close to \textit{M. oenomyia}, as to the scutal shape and aspect, but the last named has no nude mastitarsala 3.

40. \textit{Microtrombicula (Microtrombicula) oenomyia} n. sp. Cl. n° 31.

\begin{itemize}
\item \textbf{a} — Hosts : Mr : \textit{Oenomys hypoxanthus, Rattus rattus frugivorus, Clandivis smithi.}
\item PT : ears.
\item Dates : 8 Sept. 1953, also 15 & 24 Sept. and 19 Oct. 1953 (coll. Dr. Szpajenschendler and Mr. J. Wolfs).
\item Type material : Holotype n° 8953/A/Jr in the Musée d’Afrique Centrale, Tervuren (Belgium).
\end{itemize}

\begin{itemize}
\item \textbf{b} — Pl. YY, 13, and AN.
\end{itemize}

c — SIF = 6B.N.2.3III.100  \( fPp = (B)-(B)-(B).B.B \)  \( fCx = B.N.B \)

\[ fSt = 2B.2B \]
\[ fSf = 7.6!6! \]
\[ fD = 2H + 6.6.6.6.4.2 = 36 \]
\[ fV = 6.2.6.4.6.4. = 28 \]
\[ NDV = 64. \]

\text{Obs. :} Chelicera of a large size. The two solenidions, on leg-tarsi 1 and 2, are relatively long and strong. Body and leg setae abundantly barbed or branched.

41. \textit{Microtrombicula (Microtrombicula) becquaerti} n. sp. 1. Cl. n° 5.

\textbf{Note :} A certain number of mites were found in the ears of an \textit{Anomalurus jacksoni}, captured by Dr. Christy on February 26, 1913 in Luida (Mawambi-Uélé, Belgian Congo). They were labeled under the name of \textit{T. christyi}. The above sciurid was preserved in alcohol and registered in the Musée d’Afrique Centrale of Tervuren (Belgium) under the n° M.C. 16505. The mites collected in 1955 were studied at that time under unsatisfactory conditions, which led us to an improper determination. Recent observations showed that they are definitely not separable from \textit{M. becquaerti}. In the meantime, specimens labeled \textit{T. christyi} were mailed; they have to be considered as \textit{M. (M.) becquaerti}. The figures on Pl. AB are those of the slides labeled as \textit{christyi}.

\textit{1. This species is dedicated to the Professor Dr. J. Becquaert, with the expression of my sincere admiration for his scientific work.}
a — Hosts: Mr: *Paraxerus cepapi* quotus, *Anomalurus jacksoni*.
PT: ears.
Loc.: Elisabethville (Katanga), and Luidé (Uélé), Rep. of Congo, Africa: Ec.
Date: 28 May 1912 (E’ville), 26 Feb. 1913 (Uélé) (coll. Dr. J. Becquaert & Dr. Christy).
Type material: Holotype n° 28512/V/2 in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. YY, 8 to 10, also AB, 3 to 6.

c — SIF = 6B.N.2.311.100  /Pp = (B)-(B)-(B).B.B  /Cx = B4.N.B3
/Sp = 2B2.2N  /Sp = 7.6!6!  /D = 2H + 6.6.6.4.2 = 32
/V = 4(2)4.4.6.4.4.4.2 = 30  NDV = 62.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
46 53 18 23 20 43 22 23 24 34 35 38 20 24 38 54 51 6
Obs.: Differs from any other species in the scutal shape, and in its general dimensions.


= *Trombicula jadini*, Taufflieb & Mouchet, 1959 (70).
= *Trombicula* (Unallocated) *jadini*, Audy, 1954 (9).

a — Hosts: Mr: *Dasymys bentleyae*, *Otomys irroratus*, *Claviglis smithi*.
PT: ears.
Date: 5 May 1952.
Type material: Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. YY, 14, and AM.

c — SIF = 6B.N.2.311.100  /Pp = (B)-(B)-(B).B.B  /Cx = B4.N.B3
/Sp = 2B2.2N  /Sp = 7.6!6!  /D = 2H + 6.6.6.4.2 = 32
/V = 4(2)4.4.6.4.6.2 = 32  NDV = 60.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
50 59 19 25 23 48 22 26 26 35 62 37 30/25 18/25 195 163 186 544

Obs.: Differs, in many respects, from other closely related species.

43. *Microtrombicula (Microtrombicula) potto* n. sp. Cl. n° 38.

a — Host: M: *Perodicticus potto ibeanus*.
PT: ears.
Date : 20 Aug. 1956 (coll. Dr. A. Fain).
Type material : Holotype n° 20856/V/1 in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. ZZ, 1 to 4.

c — SIF = 6B.N.2.3111.100  fPp = (B)-(B)-(B).B.B  fCx = B₃.N.B₄
fSt = 2B₂.2N  fsp = 7.7.7  fD = 2H + 6.6.6.4.2 = 32
fV = 6.4.4.10.4.6.4.2 = 40  NDV = 72.

Obs. : Differs from any other species in its strong body setae (fig. 3).

44. Microtrombicula (Microtrombicula) mitellieli n. sp.  Cl. n° 26.

a — Host : M : Procavia capensis capensis.
PT : ?
Loc. : Darde, Natal, S. Africa : Es.
Date : Sept. 1951 (coll. Dr. R. Lawrence : NM-5716).
Type material : Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. ZZ, 5 to 7.

c — SIF = 6B.N.2.3111.100  fPp = (B)-(B)-(B).B.B  fCx = B₃.N.B₃
fSt = 2B₂.2N  fsp = 7.7.7  fD = 2H + 6.6.4.4.2 = 28
fV = 4.4.6.4.6.4.2 = 30  NDV = 58.

Obs. : M. mitellieli is very closely related to M. zumpti, and differs from it in having smaller general dimensions. The dorso-subterminal butting tooth of the chelicera is somewhat pointed, similar to that of M. tamisci and M. paraxeri.

45. Microtrombicula (Microtrombicula) zumpti n. sp.  Cl. n° 50.

a — Host : M : Procavia capensis capensis.
PT : ?
Loc. : Darde, Natal, S. Africa : Es.
Date : Sept. 1951 (coll. Dr. R. Lawrence : NM-5716).
Type material : Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. ZZ, 8 to 12.
Cl. no 33.
= Trombicula (Trombicula) panieri, Audy, 1954 (9), Womersley & Audy, 1957 (85).

a — Hosts: Mr: Dasymys bentleyae, Claviglis smithi, Mastomys coucha.
PT: ears.
Type material: Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. AB, 2, and AP.

c — SIF = 6B.N.2.3III.100 \( fPp = (B)-(B)-(B).B.B \) \( fCx = B_4B_1B_3 \)
\( fSt = 2B.2N \) \( fSp = 7.7.7 \) \( fD = 2H + 8.6.4.4.4.2 = 34 \)
\( fV = 4.4.4.6.2.6.2.4 = 32 \) NDV = 66.

Obs.: Species of medium size, larger than M. mitellieli, but identical in shape.

47. Microtrombicula (Microtrombicula) mushwerensis n. sp. Cl. no 27.

a — Hosts: Mr: Rattus rattus alexandrinus, Oenomys hypoxanthus, Lophuromys aquilus.
PT: ears.
Dates: 19 Mar. 1954, also 2 Jun. 1953 (coll. Mr. G. Sadin and Mr. Lorgé).

Type material: Holotype in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. AB, 1 and AO.

c — SIF = 6B.N.2.311.000 /Pp = (B)-(B)-(N).B.B /Cx = B.B.B
/Sl = 2B.2B /Sp = 7.6!6! /D = 2H + 8.6.6.6.4.2 = 34
/V = 6.6.6.8.4u.4.2 = 36 NDV = 70.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
42 50 21 30 24 54 29 37 31 39 70 50 41/30 37/30 258 214 246 718

Obs.: Closely related to M. panieri, but slightly larger. Differs mostly in its body setation, more in form and length than in number.

48. Microtrombicula (Microtrombicula) duboisi n. sp. 1. Cl. n° 9.

a — Hosts: Mr: Oenomys hypoxanthus, Lophuromys aquilus.

PT: ears.


Date: 19 Feb. 1954 (coll. Dr. Pirlot).

Type material: Holotype n° 19254/B/1 in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. AB, 8 to 10, and AQ.

c — SIF = 6B.N.2.311.000 /Pp = (B)-(B)-(N).B.B /Cx = B.B.B
/Sl = 2B.2B /Sp = 7.6!6! /D = 2H + 8.6.4.6.4 = 30
/V = 6.4.4.6.4u.6.4.2 = 36 NDV = 66.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
40 50 20 27 24 51 28 25 31 38 58 48 40/30 24/30 130 190 222 642

Obs.: Differs from M. panieri in its pilosity.

49. Microtrombicula (Microtrombicula) major n. sp. Cl. n° 22.

Larva:

a — Hosts: Mr: Lophuromys aquilus, Dendromus lineatus.

PT: ears.


Type material: Holotype n° 19254/D/1 in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. AB, 7, and AR.

1. This species is dedicated with my respectful compliments to Professor Dr. A. Dubois, of the Institute of Tropical Medicine, in Anvers (Belgium).
c — SIF = 6B.N.3.311.000  \( fP\beta = (B)-(B)-(B).B.B \)  \( fCx = B.B.B \)
\( fSt = 2B.2B \)  \( f\beta = 7.7.7 \)  \( fD = 2H + 8.8.8.6.6.2 = 40 \)
\( fV = (6.2)8.10.8.4.6.4 = 44 \)  \( NDV = 84. \)

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
51 62 25 35 33 68 40 45 37 49 81 58 49/33 30/33 308 258 298 864

**Obs.** : Differs from any other species in its size. Large species. Palpal claw trifurcate.

**Nymph** :

a — Host : *Dendromus lineatus*.

Loc. : Lwiro.

Larva date : 10 May 1954.

Emerg. date : 5 to 12 June 1954; pupation period : 26 to 33 days.

Ref. material : Specimens in the Musée d’Afrique Centrale, Tervuren (Belgium).

b — Pl. AS, 1 & 2.

c — \( fTn = 9B.3S \)  \( ASL/SB = 2.5 \)  \( PGC = 2 \)  \( PGS = 1 \)

\( fSt = 8B \)  \( Hy\beta = 2 (4N) \)

Sens. : \( SP = 50 \) (covered with tiny spicules)

\( SA = 58 \) (many short branches 8 \( \mu \)).

\( CL = 50 \)  \( CA = 33 \)  \( BL = 98 \)  \( BH = 38 \)

\( pCS = \) about 20 (on each side of crista).

<table>
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<tr>
<th>ASL</th>
<th>PSL</th>
<th>CTL</th>
<th>SB</th>
<th>S</th>
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<td>66</td>
<td>98</td>
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</table>

**Obs.** : Small size, but large by comparison with the nymphs of the other members of the verrucascuta-group.

50. *Microtrombicula (Microtrombicula) cynictia* (Radford, 1942). Cl. no. 8.

= *Trombicula cynictia*, Radford, 1942 (59), 1946 (60), 1947 (61), 1954 (64), Michener, 1946 (54), Lawrence, 1949 (46), Philip & Fuller, 1950 (56), Loomis & Crossley, 1953 (51).

= *Trombicula (Trombicula) cynictia*, Wharton & Fuller, 1952 (82), Audy, 1954 (9).


**Note** : The original description is insufficient concerning required data and details. In addition, the dimensions given in Radford’s original publication are erroneous. Moreover, in that same publication, wrong measurements were given for *Trombicula mastomyia*. The study of two paratypes was undertaken and the results are stated below.
a — Host : M : Cynictis penicillata ogilbyi.
   PT : ?
   Loc. : Hoopstad, Orange Free State, S. Africa : Es.
   Date : 30 June 1938.
   Type material : Holotype in the British Museum, London (England).

b — Pl. RR, 7 to 11.

c — $SIF = 6B.N.2.3I.I.100$  
   $fPp = (B)\cdot(B_2)\cdot(B_3).N'.B_2$  
   $fCx = B_9.N.B_5$  
   $fSt = 2B_2.2N^\prime$  
   $f\chi = 7.7.7$  
   $fD = 2H + 10.8.6.4.4 = 40$  
   $fV = 4.6.6.6.6u.4.4.2 = 44$  
   NDV = 84.

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<td>51</td>
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<td>23</td>
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<td>46</td>
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<td>10</td>
<td>9</td>
<td>14</td>
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<tr>
<td>Radfords'</td>
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<td>—</td>
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<td>—</td>
<td>—</td>
<td>—</td>
<td>—</td>
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</table>

Obs. : This species is close to M. panieri, but differs in its pilosity arrangement and in its Ip.


= Microtrombicula (Scapusculata), V.-G., 1960 (75) n. comb.
= Trombicula, GATER, 1932 (37), Womersley, 1952 (84), LOOMIS & CROSSLEY, 1953 (51),
  LOOMIS, 1954 (48).
= Otonyssus, BUI TEN DIJK, 1945 (23).
= Trombicula (Trombicula), WHARTON & FULLER, 1952 (82), AUDY, 1954 (9), WOMERSLEY
  & AUDY, 1957 (85).
= Trombicula (Neotrombicula), Womersley, 1952 (84), in part.
= Trombicula (Miyatrombicula), Womersley & AUDY, 1957 (85), in part.

Note : This subgenus lacks indubitable homogeneity. In fact, the analysis of the species includes justifies their eventual place in either Eltonella or Micro-
  trombicula sensu stricto. For instance, the following species belong to a special group of Eltonella, the gerrhosauri-group : $fieldi$ AUDY, 1956, $maura$ Taufflieb,
  1960, $meridialis$ Taufflieb, 1960 and $rhoptropi$ Lawrence, 1949. They are parasites of reptiles and AUDY and VERCAMMEN-GRANDJEAN (1961) created for them
the subgenus Squamicola, a name insufficiently supported for the status of subgenus.

In the same way, the following species also belong to a group of mammal para-
sites more Eltonella than Microtrombicula : $khurdangensis$ Womersley, 1952, $rajo-
riensis$ Womersley, 1952, villiersi n. sp. and womersleyi n. sp.
Finally, the following could have been placed under the subgenus *Microtrum bicula* : *crossleyi* Loomis, 1954, *munda* Gater, 1932, *spicea* Gater, 1932 and *trisetica* Loomis & Crossley, 1953. The case of *spicea* Gater, 1932 requires special attention by the fact that it possesses two slightly expanded sensillae — just like *Asc schoengastia* (Paralaurentella) *oenigma* (Lawrence, 1949) — and because of that, it constitutes another interesting link bringing close together the two important complexes : *Eltonella-Microtrum bicula* and *Asc schoengastia*.

Notwithstanding the preceding considerations, the maintenance of the subgenus *Scapuscutala* is desirable as a link between *Eltonella* and *Microtrum bicula*, making evident their very close relationship.

**Larva** :

a — Hosts : B, H, M, Mr.
   PT : ears, body.
   Loc. : Tropical, subtropical, and temperate regions ; old and new world.

b — Pl. FF to II, and KK.

c — SIF = 6B\(_N\).2.3111.\(_0\).00  ST = +  \(\rho ST = +\)  PT' = +  PT" = +  \(f_{sp} = 7.7.7\)  \(f_{Cx} = B.B.B\) (B.B.5B for *M. crossleyi*)  \(f_{St} = 2B.2B\)
   \(I'p = 480 - 1010\).

**Nymph** :

There is no particular character permitting any differentiation between the nymphs of *Eltonella* and *Microtrum bicula*, and, with greater reason, between these and *Scapuscutala*.

1. *Microtrum bicula* (*Scapuscutala*) *crossleyi* (Loomis, 1954) [Ts] [gr. T].
   Cl. n° 51.

= *Trombicula* (*Trombicula*) *crossleyi*, V.-G., 1960 (75).

**Larva** :

a — Hosts : B : *Melanerpes erythrocephalus* ; Mr : *Peromyscus leucopus*, *P. mani culatus*.
   PT : ?
   Loc. : Kansas (Barber Co.), Oklahoma (Comanche Co.), USA : Ne.
   Date : 26 July 1952.
   Type material : Holotype n° KU 3075 in Snow Entom. Mus., Univ. Kansas (USA).

b — Pl. II, 4 to 6, and 8.
c — SIF = 6B.N'.2.3111.100  fPp = (B)-(B)-(B).B.B  fCx = B.B.5B  

fSt = 2B.2B  fsp = 7.7.7  fD = 2H + 8.6.6.6.4.2.2 = 36  

fV = 8.6.6.6u.4 = 36  NDV = 72.  

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip  
35 46 12 22 20 42 22 21 18 27 34 30 24/21 17/19 204 170 200 574  

Obs. : Differs from trisetica in its fCx and in its dimensions (scutum).  

NYMPH :  
a — Hosts : Melanerpes erythrocephalus, Peromyscus leucopus.  

Loc. : Kansas (Barber Co.), USA., Ne.  


Emerg. dates : ?  

b — Pl. AT, 1 to 8, and 13.  
c — fTn = 9B.3S  ASL/SB = 2.2  PGC : 2  PGS : 1  

fSt = 4B.  Hyb. = 2(4N)  

Sens. : SP = 25 (covered with short barbs),  

SA = 40 (expanded, diam. 2 μ; branched).  

CL = 37  CA = 18  BL = 82  BH = 28  

pCS = 2 or 3 (on each side of crista).  

ASL PSL CTL SB S T IL PW OW CW  
59 23 96 27 66 21 400 204 220 152  
P1 P1 P1 IPn D TL TH tL  
380 222 220 274 196 14/20 77 37 66  

Obs. : Very close to merrihewi from which it differs only slightly in measurements.  

2. Microtrombicula (Scapuscutala) munda (Gater, 1932). Cl. nº 56.  


= Otonyssus munda, BIJENDRIJK, 1945 (23).  

= Trombicula (Eutrombicula) munda, THOR & WILLMANN, 1947 (72).  

= Trombicula (Trombicula) munda, WHARTON & FULLER, 1952 (82), AUDY, 1954 (9), DOMROW, 1957 (26), WOMERSLEY & AUDY, 1957 (85).  

= Trombicula (? Neotrombicula) munda, WOMERSLEY, 1952 (84).  

LARVA :  
a — Hosts : Mt : Rattus canus malaisia, R. mulleri validus, R. rattus diardi, R. r. kandiyanus.  

PT : ears.  

Loc. : Kuala Lumpur, Selangor, Malaya : Om.
Date: 1929.
Type material: Holotype in the British Museum, London (England).

b — Pl. KK, 6 to 10.

c — SIF = 6B.N.2.3111.100
fPΦ = (B)-(B)-(B).B.B  fCx = B₂.N.N
fSt = 2N.2N  fSΦ = 7.7.7  fD = 2H + 6.6.4.2.2 = 26
fV = 4.4.6.6.2.4u.4.2 = 32  NDV = 58.

AW  PW  SB  ASB  PSB  SD  AP  AM  AL  PL  S  H  D  V  pa  pm  pp  Ip
35  47  14  19  18  37  20  22  20  30  38  34  24/19  16/21  176  138  174  488

Obs.: Close to crossleyi; differs in the aspect of its setation and in the number of body setae.

Nymph:
a — Host: R. r. diardi.
Loc.: Gombak Lane, Kuala Lumpur, Malaya.
Larva date: 10 June 1955.
Emerg. date: ?
Ref. Material: CORU 40718.

b — Pl. AW, 1 to 7.

c — fΩn = 9B.3S  ASL/SB = 2.7  PGC = 2  PGS = 1
fSt = 4B.  HyΦ. = 2(4N)
Sens.: SP = 25 (covered with short barbs),
SA = 35 (diam. 1 μ, numerous branches).
CL = 34  VA = 18  BL = 74  BH = 24
fCS = 4 (on each side of crista).

Obs.: Very small species.

3. Microtrombicula (Scapuseutala) nadchatrami n. sp.¹. Cl. nº 57.

a — Host: Mr: Rattus niveiventer (Nº 222 and R. 70205).
PT: ears.
Loc.: Ban Thenong, Lien Khoang and Lat Huang, Khouang Prov., Laos.
Date: 25 and 26 August 1960.

b — Pl. AY, 1 to 5.

¹ Dedicated, with my deepest thanks to Mr. Nadchatram, who sent me the six original specimens.
c — SIF = 6B.N.2.3III.100  \( fPp = (B)-(B)-(B)_{2}B_{1}B_{2} \)  \( fCx = B.B.B \)
\( fSt = 2B.2B. \)  \( fSp = 7.7.7 \)  \( fD = 2H + 6.8.6.4.4.2 = 32 \)
\( fV = 6.6.4.6.6u.4.4 = 40 \)  NDV = 72.

AW  PW  SB  ASB  PSB  SD  AP  AM  AL  PL  S  H  D  V  pa  pm  pp  Ip
44  59  16  24  25  49  25  31  28  38  56  39  32/27  21/28  227  194  223  644

Obs. : Resembling *munda*, but larger in size.

4. *Microtrombicula (Scapuscutala) spicea* (Gater, 1932). Cl. n° 60.


= *Trombicula (Eutrombicula) spicea*, Thor & Willmann, 1947 (72).

= *Trombicula (Neotrombicula) spicea*, Womersley, 1954 (84).

= *Eutrombicula* n. sp. « A », in Lawrence's MS, after Womersley, 1952 (84).


**Larva :**

a — Hosts : Mr : *Rattus canus malaisia, R. mulleri validus, R. r. kandiyanus.*
PT : ears.
Loc. : Sungei Buloh, Selangor, Malaya : Om ; Embilipitiya, Ceylon (S.H. Jayewickreme) : Oi.
Date : 8 Aug. 1930, Jan 1945.

Type material : Holotype in the British Museum, London (England).

b — Pl. HH, 8 & 10 (Ceylon).

c — SIF = 6B.N.2.3III.100  \( fPp = (B)-(B)-(B)_{2}B_{1}B_{2} \)  \( fCx = N".N.N" \)
\( fSt = 2N.2N" \)  \( fSp = 7.6!6! \)  \( fD = 2H + 6.4.4.4.2 = 26 \)
\( fV = 4.4.6.6.4u.2.2 = 28 \)  NDV = 54

for the Ceylonese form : \( fD = 2H + 6.6.4.4.4.2 = 28 \).

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<th>Ceylon</th>
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<td>50</td>
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<tr>
<td>Ceylon</td>
<td>44</td>
<td>56</td>
</tr>
</tbody>
</table>

S  H  D  V  pa  pm  pp  Ip  S

Obs. : Particular in its slightly expanded sensillae (\( \phi = 1.5 \mu \)), which relate this species to subgenus, *Ascoschoengastia (Laurentella)* in the Tribe *SCHOEN-GASTIINI*.

**Nymph :**

a — Host : *Rattus r. kandiyanus*.
Loc. : Embilipitiya, Ceylon : Oi.
Larva date : Jan. 1945 (coll. & rear. : Mr. S. H. Jayewickreme).
Emerg. date: ?

b — Pl. AX, 8 to 14; erroneously labelled "womersleyi".

c — \( fTn = 9B.3S \) \( ASL/SB = 2.5 \) \( PGC = 2 \) \( PGS = 1 \)
\( fSt = 4 \) to 6B. \( Hyp. = 2 \) (4N)
Sens.: \( SP = 44 \) (covered with short barbs), \( SA = 56 \) (uniformly thick).
\( CL = 44 \) \( CA = 23 \) \( BL = 78 \) \( BH = 28 \)
\( pCS = 3 \) to 4 (each side of crista).

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<td>45</td>
<td>90</td>
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</table>

Obs.: Differs from any other species in its measurements. Medium size species.

Cl. nº 61.


**Larva:**

a — Hosts: H, Mr: *Eumeces laticeps, Elaphe obsoleta, Peromyscus truei*.
PT: ?
Loc.: Miami Co., Kansas (near Fontana, Pigeon Lake area), and California, USA: Ns.
Date: 26 May 1951.
Type material: Holotype in the University of Kansas (USA).

b — Pl. HH, 6.

c — \( SIF = 6B.N.2.3III.100 \) \( fPp = (B)-(B_1)-(N^*) \) \( B.B \) \( fCx = B.B.3B \)
\( fSt = 2B.2B.2B \) \( fsp = 7.7.7 \) \( fD = 2H + 8.4.6.6.4.2 = 38 \)
\( fV = 4.4.4.6.6.4.2 = 36 \) \( NDV = 74 \).

AW\ PW\ SB\ ASB\ PSB\ SD\ AP\ AM\ AL\ PL\ S\ H\ D\ V\ pa\ pm\ pp\ Ip
| 49 | 61 | 18 | 25 | 23 | 48 | 21 | 25 | 22 | 30 | 49 | 36 | 29/28 | 18/25 | 218 | 184 | 206 | 608 |

Obs.: Related to *spicea* and *crossleyi*, also to *Eltonella carmenae, E. fragilbarba* and *E. parvula*.

**Nymph:**

a — Host: *Elaphe obsoleta*.
Larva date : 10 Sept. 1952.
Emerg. date : ?

b — Pl. AV, 9 to 13, and 5.

c — $fTn = 9B.3S$  $ASL/SB = 2.2$  $PGC : 2$  $PGS : 1$
$fSt = 4B.$  $Hy\phi. = 2(4N)$
Sens. : $SP = 37$ (covered with short barbs),
        $SA = 48$ (diam. 3 $\mu$, numerous branches).
$CL = 41$  $CA = 22$  $BL = 91$  $BH = 30$
$\phiCS = 2$ or 3 (on each side of crista).

<table>
<thead>
<tr>
<th>ASL</th>
<th>PSL</th>
<th>CTL</th>
<th>SB</th>
<th>S</th>
<th>T</th>
<th>IL</th>
<th>PW</th>
<th>OW</th>
<th>CW</th>
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<td>107</td>
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<td>85</td>
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<td>246</td>
<td>296</td>
<td>1180</td>
<td>15/21</td>
<td>83</td>
<td>40</td>
<td>72</td>
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</tbody>
</table>

Obs. : Slightly larger species than crossleyi.

6. Microtrombicula (Scapuscutala) rajoriensis (Womersley, 1952).  Cl. no 58.

= Trombicula rajoriensis, Womersley, 1952 (84), Audy, 1954 (9), Radford, 1954 (64).

= Trombicula (Miyatrombicula) rajoriensis, Womersley & Audy, 1957 (85).

a — Host : Mr : "rat" ?
PT : ?
Loc. : Rajori, Kashmir, India : Oi.
Date : May 1948.
Type material : Holotype in S. Austral. Museum, Adelaide (S. Australia).

b — Pl. HH, 2.

c — $SIF = 6B.B.2.311.000$  $fPp = (B)-(B)-(B).B.B$  $fCx = B.B.2B$
$fSt = 2B.2B$  $fsb = 7.7.6$  $fD = 2H + 8.8.6.4.4.2 = 34$
$fV = 2.6.6.6.6.6.6u.6.4.2 = 50$  $NDV = 84.$

<table>
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<th>AW</th>
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<th>ASB</th>
<th>PSB</th>
<th>SD</th>
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<td>40/—</td>
<td>286</td>
<td>260</td>
<td>300</td>
<td>846</td>
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</table>

Obs. : Related to E. buxtoni. Differs from this species in its barbed galeal setae and lack of mastitarsala on leg 3.

7. Microtrombicula (Scapuscutala) khurdangensis (Womersley, 1952).  Cl. no 53.

= Trombicula khurdangensis, Womersley, 1952 (84).
= Trombicula kurdangensis (sic!), Radford, 1954 (64).
= Trombicula (Trombicula) khurdangensis, Audy, 1954 (9), Womersley & Audy, 1957 (85).
a — Host : Mr : "rat"?
PT : ?
Loc. : Khurdang, Kashmir, India : Oi.
Date : July 1949 (coll. S. L. Kalra).
Type material : Holotype in S. Austral. Museum, Adelaide (Australia).

b — Pl. HH, 4.

c — SIF = 6B.N.2.3111.000 /Pp = (B)-(B)-(B).B.B /Cx = B.B.B
/St = 2B.2B /sp = 7.7.7 /D = 2H + 4.6.6.4.6.6.4.2 = 44
/V = 8.6.8.8.6.6.4.2 = 56 NDV = 100.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
62 73 22 28 28 30 30 48 65 — 38/— 32/— 260 247 286 793

Obs. : Differs from any other known species in its measurements, pilosity (numerous) and lack of mastitarsala on leg 3.

8. Microtrombicula (Scapuscutala) villiersi n. sp. Cl. n° 62.

a — Host : Mr : Rattus chrysophilus.
PT : ears.
Loc. : Punta Maria, Kruger Nat. Park, S. Africa : Es.
Date : 10 Feb. 1961 (coll. Dr. de Villiers, SAIMR).
Type material : Holotype in Musée d'Afrique Centrale, Tervuren (Belgium).

b — Pl. GG, 1 to 7.

c — SIF = 6B.B.2.3111.000 /Pp = (B)-(B)-(B).B.a.B /Cx = B.B.B
/St = 2B.2B /sp = 7.7.7 /D = 2H + 8.4.2.4.2.4.4.2 = 32
/V = 4.6.6.6.6.4.4.2 = 40 NDV = 72.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
69 81 26 32 30 62 35 40 38 52 86 52 44/41 28/45 277 245 270 802

Obs. : Scutum reticulo-punctate. Differs from any known species in many respects.

9. Microtrombicula (Scapuscutala) fieldi (Audy, 1956) [gr. T]. Cl. n° 52.

= Eutrombicula fieldi, Audy, 1956 (11), Womersley & Audy, 1957 (85), Audy, 1957 (13).

a — Hosts : H : Lygosoma olivaceum, Draco volans.
PT : ?
Loc. : Bukit Lagong F.R., Kepong and Ulu Langat, Selangor, Malaya : Om.
Type material : Holotype n° CORU 4094 ; n° B.M. 1956.8.21.8 in British Museum, London (Eng.).

b — Pl. II, 1 to 3, and 7.
-124-

c — SIF = 6B.N.2.3III.000 fPp = (N)-(N)-(N).N.N fCx = B.B.B
fSt = 2B.2B fSφ = 7.7.7 fD = 2H + 6.6.6.4.2.2 = 28
fV = 4.4.4.4u.2. = 18  NDV = 46.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
65 74 30 22 23 45 21 27 33 46 37 34/29 25/30 238 198 228 664

Obs. : Differs from any other known species in its pilosity and measurements.

10. Microtrombicula (Scapuscutala) maura (Taufflieb, 1960). Cl. n° 54.

= Eutrombicula maura, Taufflieb, 1960 (68).

a — Hosts : H : Eremias guttulata, Agama bibroni.
PT : ?
Loc. : Tnine de Bouchane (midway betw. Mazagan & Marrakech), Marrakech and Assa, Morocco : Pm.
Dates : 3 July 1958, then 7 July 1958 and 1959.
Type material : ?

b — Pl. FF, 7.

c — SIF = 6B.B.2.3III.000 fPp = (B)-(B)-(N).N.B fCx = B.B.B
fSt = 2B.4B fSφ = 7.7.7 fD = 2H + 8.6.6.4.4.2 = 32
fV = 6.6.6.4u.8.6.4.2 = 43  NDV = 74.

AW PW SB ASB PSB SD AP AM AL PL S H D V pa pm pp Ip
62 72 20 23 18 41 17 22 17 29 52 32 35/25 17/25 303 267 313 883

Obs. : This species and the following are peculiar in the proximal position of two genualae on leg I ; maura differs from meridialis in its measurements and less numerous pilosity.

II. Microtrombicula (Scapuscutala) meridialis (Taufflieb, 1960). Cl. n° 55.

= Eutrombicula meridialis, Taufflieb, 1960 (68).

a — Host : H : Stenodactylus (Stenodactylus) mauritanicus.
PT : ?
Loc. : Goulimine (220 miles, South of Marrakech), Morocco : Pm.
Date : ?
Type material : ?

b — Pl. FF, 9.

c — SIF = 6B.B.2.3III.000 fPp = (B)-(B)-(N).N.B fCx = B.B.B
fSt = 2B.4BB fSφ = 7.7.7 fD = 2H + 8.6.6.6.4.4.4 = 40
fV = 8.6.10.8.6u.6 = 50  NDV = 90.

= Eutrombicula rhoptropi, LAWRENCE, 1949 (46), RADFORD, 1954 (64).
= Trombicula (Trombicula) rhoptropi, WHARTON & FULLER, 1952 (82).
= Trombicula (Unallocated) rhoptropi, AUDY, 1954 (9).
= Eutrombicula (Squamicola) rhoptropi, AUDY & V.-G., 1961 (17).

a — Host : H : Rhoptropus afer.
PT : ?
Date : ?
Type material : Holotype n° TM 2 in Transvaal Museum, Pretoria, Transvaal, S. Africa.

b — Pl. HH, 7.

c — SIF = 6B.N.2.311.100 jPj = (B)-(N)-(N).N.N jCx = B.B.B
jSt = 2B.2B jSp = 7.7.7 jD = 2H + 6.6.4.4.2 = 24
jV = 4.4.4.4a.2 = 18 NDV = 42.

Obs. : Close to the gerrhosauri-group.

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(70) TAUFFLEB (R.) & MOUCHET (J.), 1959. — “Revue des Trombiculidae du Cameroun et Description de huit espèces et sous-espèces nouvelles.” Acarologia, 1, 228-245.


(81) WHARTON (G. W.), 1948. — “Four new Peruvian chiggers (Acarina-Trombiculidae).” Psyche, 55, 87-100.


ELTONELLA (TRAUBIELLA) — 5
LEPTOTROMBIDIUM (CHIROPTELLA) — 1 to 4

Pl. A.
Pl. B.

Pl. D.


Pl. E.
*Eltonella ugandae* (V.-G. C. Brennan 1957)

---

Eitonella ugandae felis n.sp.

Pl. M.
Pl. Q.
Ettanella centropl n.sp. (nymphal) S

Pl. S.
*Eltanella montensis* (Lawrence 1943)

**Pl. AA.**

*Eltanella dacoensis* (Lawrence 1949)

**Pl. BB.**

*Eltanella rhodesiensis* (Lawrence 1949)

**Pl. CC.**
Ethonella geoffroyi (Lawrence 1943)

Pl. DD.

Ethonella pachyacyli (Lawrence 1949)

Pl. EE.
Pl. FF.

ELTONELLA AND
MICROTROMBICULA
Mtr. (Scop.) villiersi n.sp.

Pl. GG.
ELTONELLA and MICROTROMBICULA

1. Elt. (Cec.) tibettsii
2. Mr. (Scap.) rajoresista
3. Elt. (Elt.) sapera
4. Mr. (Scap.) khurdangensis
5. Elt. (Elt.) parvula
6. Mr. (Scap.) trisefica
7. Mr. (Scap.) rhoptrioppi
8. Mr. (Scap.) spicada
9. Mr. (Scap.) spicada (Ceylon)
10. Elt. (Elt.) agone

Pt. HH.
M. minutissima  S. munda  M. audyi n.sp

Pl. KK.
Pl. 00.
Pl. PP.
Pl. TT.
Microtrombicula (Microtrombicula) uchidai

Pl. UU.
Pl. WW.
M. kawaensis n.sp.  M. sciuricola n.sp.  M. lephuromyia n.sp.

Pl. XX.
Pl. ZZ.
1. M. moshwetrensis n.sp.
2. M. panieri
3. M. bequaerti n.sp.
4. M. duboisii n.sp.
5. M. major n.sp.

Pt. AB.
Microtrombicula resseleri n.sp. AC

Pl. AC.
Microtrombicula hoogstraali (Radf. 1954)

Pl. AD.
Microtrombicula viverida n.sp. AE

Pl. AE.
Microtrombicula brutsaerti n.sp.

Pl. AF.
Microtrombicula verrucascuta n.sp.

Pl. AH.

Microtrombicula verrucascuta (nymph)
Microtrombicula vanhoofi n.sp. AJ

Pl. AJ.
Microtrombicula vanhoofi (nymph)  AK

Pl. AK.
Microtrombicula alexandrina n.sp.
Microtrombicula jadini (V-G. 1952)

Pl. AM.
Microtrombicula ænomyia n.sp.
Microtrombicula mushwerensis n.sp.

Pl. AO.
Microtrombicula panieri (Jad.S.V-G.52)

Plate: AP

Microtrombicula dubosi n.sp.
Microtrombicula major n.sp.

Pl. AR.
Microtrombicula major (nymph)

PL. AS.
Pl. AU.
* = *M. (S.) spicca* Gaster, 1932.