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Previous volumes (2010-2018): 250 € / year (4 issues)

Acarologia, CBGP, CS 30016, 34988 MONTFERRIER-sur-LEZ Cedex, France

ISSN 0044-586X (print), ISSN 2107-7207 (electronic)

The digitalization of Acarologia papers prior to 2000 was supported by Agropolis Fondation under the reference ID 1500-024 through the « Investissements d'avenir » programme (Labex Agro: ANR-10-LABX-0001-01)



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TROMBICULID MITE OF UNDETERMINED GENUS
AND SPECIES FROM DEPOK, JAVA, BEING FRAGMENTS
IN THE BERLESE COLLECTION MISIDENTIFIED
AS *TROMBICULA MINOR* BERLESE, 1905¹

BY

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In his original brief description of *Trombicula minor* in 1905, in material obtained from bat-guano from a cave in TJIAMPEA in JAVA, BERLESE did not refer to any particular specimen as type. He illustrated his description by a drawing of a complete mite with scutum, but less parts of some legs. After this study, BERLESE deposited the type-slide or specimen in the Museum of HAMBURG, GERMANY. That slide was studied some 35 years later by C. WILLMAN (1940) who showed that the slide contained two specimens, one specimen badly crumpled and apparently a nymph, the other a gravid female, intact. WILLMAN redescribed the adult female and in doing this, as first reviser, he effectively designated the adult as lectotype.

The slide containing the lectotype was destroyed during World War II. Details of all the circumstances were published by GUNTHER (1951) and by VERCAMMEN-GRANDJEAN (1962). *Trombicula minor* is type-species of the genus *Trombicula* Berl. of the family TROMBICULIDAE. Since the lack of a type for this species, combined with incomplete descriptions of the original material, had led to considerable confusion in the taxonomy of the TROMBICULIDAE, a neotype of *T. minor* was designated by AUDY, NADCHATRAM, LOOMIS & TRAUB (1964) and described in larval, nymphal, and adult forms. At the same time, these authors gave a new name, ?*Myotrombicula dilarami*, to the species which COOREMAN (1960) had pre-

1. This investigation was supported by US Public Health Service Grant E-3793-03 from the National Institute of Allergy and Infectious Diseases.

viously designated as neotype of *T. minor* without satisfying the mandatory requirements of the International Rules. These authors (section 2.2, page 8) also referred to the fragments which are described in the present paper.

In 1912, BERLESE introduced some fragments (“*alcuni frammenti*”) of a specimen which he considered conspecific with *T. minor*, in spite of the impossibility of determining this from fragments on the basis of taxonomic criteria prevailing at that time. It appears that having deposited the original type-slide in the Museum at HAMBURG, BERLESE rediscovered the fragments which he considered as the same species. The slide of the fragments was presumed to be in BERLESE’s collection at the Stazione di Entomologica Agraria in Florence (Italy). Professor Dr. Antonio MELIS, the Director of this station, kindly made a special search for such a slide in June 1962, and concluded, from a search of the collection and the catalogues, that there was no such slide now available. This was reported, and parts of the correspondence quoted, by VERCAMMEN-GRANDJEAN (1962 a).

Nevertheless, in 1963 Dr. Fausta PEGAZZANO discovered entirely by accident a slide containing fragments of a trombiculid and labelled “123/14, *Trombicula minor* Ber. tipico. rotto. Depok, Giava. Kraepelin”. With the kind permission of the Director, Dr. PEGAZZANO escorted this slide on a visit to the U.S.A. in late 1963, and we were, with the great generosity of the Director, allowed to study and describe these fragments. It has been a privilege to be able to study material labelled by BERLESE. The slide has been returned to the collection in FLORENCE.

Unfortunately, the fragments, comprising palp and parts of the legs, are too incomplete to allow them to be ascribed to any genus, or to be named as a species in a provisional genus. They are thus taxonomically valueless. BERLESE assumed that the specimen from which the fragments were recovered must be co-specific with *T. minor* because the fragments were found in bat-guano in the same general locality (but evidently not the same cave, in DEPOK and not TJIAMPEA). We now know that this is a wholly unacceptable assumption: for example, COOREMAN’s (1960) set of 9 postlarval specimens from bat-guano in a cave in AFGHANISTAN comprised at least 3 species in at least two genera (VERCAMMEN-GRANDJEAN, 1962). *Trombicula minor* came from a cave in TJIAMPEA, the present fragments came from a cave nearby in DEPOK. We have found completely different mite fauna in adjacent caves, and several species in each cave.

There is no possibility that these fragments came from the specimen(s) regarded as *T. minor* by BERLESE in 1905 since he drew a complete mite and did not mention the fragments until 1912, using them for supplementary data.

It is not certain that the present fragments are BERLESE’s *alcuni frammenti* but for lack of any contradictory evidence we must assume that this is so. We cannot find sufficient evidence to suppose that there may have been a second set of fragments, from a fourth specimen from TJIAMPEA itself — this possibility was suggested by AUDY *et al.*, *loc. cit.* The fragments cannot be used in any way to clarify the confusion surrounding the exact nature of the genus *Trombicula*.

Not only are they too fragmentary, but there would be no possibility of guessing the nature of the larval stage. The classification of the TROMBICULIDAE is, however, based on larval characters. We therefore describe the fragments "for the record" as belonging to a Trombiculid mite unidentifiable as to genus or species.

TROMBICULID MITE, *genus and species undetermined and undeterminable.*

= *Trombicula minor* Berlese 1905, presumed "*alcuni frammenti*" of Berlese 1912, slide No. 123/14, misidentified by BERLESE.

= *Trombicula sp. indet.*, AUDY, NADCHATRAM, LOOMIS & TRAUB, 1964 : 9.

Description of Fragments of Nymph (Fig. 1).

The fragments comprise palp, hypostome, and the two pairs of anterior coxae fused together and with the gnathobase.

1. *List of Fragments.*

A. GNATHOSOMA.

- 1 — The two chelobases and the cheliceral blades are intact.
- 2 — The entire hypostoma.
- 3 — The two palpal trochanterae.
- 4 — Separately in the preparation, the right palpus with only the anterior paraglyph (comb) present, posterior lost.

B. PROPODOSOMA.

- 1 — No trace of "*crista metopica*" or parts of the dorsum.
- 2 — Ventrally, four fused anterior coxae present.
- 3 — The anterior right leg (leg I) is entire.
- 4 — The left leg I lacks its tibia and tarsus.
- 5 — The right leg II lacks also its tibia and tarsus.
- 6 — The left leg II has only its trochantera.

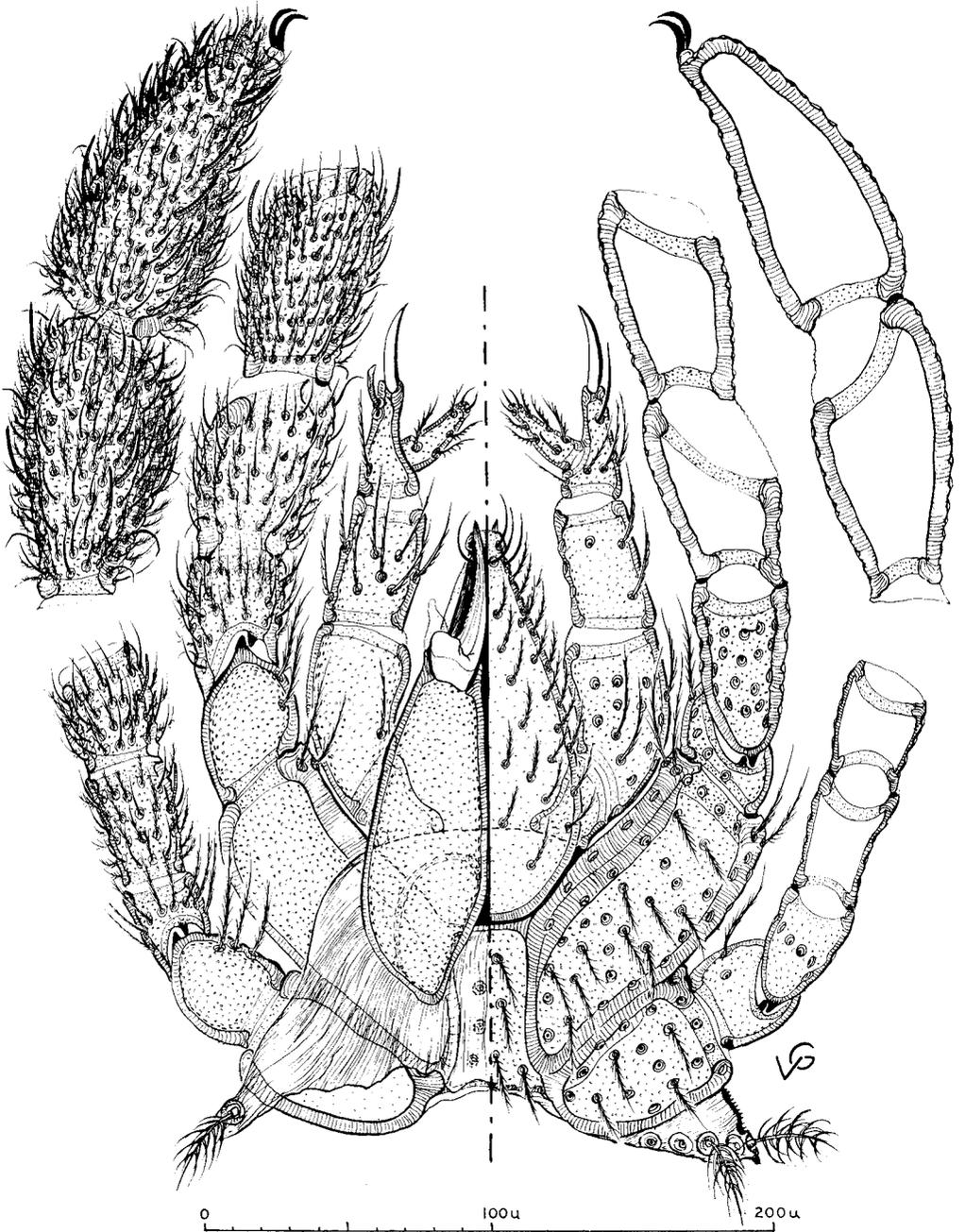
2. *Description of the Fragments.*

A. GNATHOSOMA.

- 1 — *Chelicera* : The chelobases and chelostyles* are shaped as in any species belonging to the subfamily TROMBICULIDAE ; chelobase length 122 μ , width 46 μ ; cheliceral blades length 58 μ , base height 30 μ .
- 2 — *Hypostoma* : Elongated, length 136 μ , width 62 μ ; bears a restricted number of barbed setae (about 50) and four nude and rigid setae on each of its two apical lobes.
- 3 — *Palpus* : Only one palpus — the right one — remains and is located near the edge of the coverslip. Bearing few slender barbed setae :

*. See Note 3, p. 285, in this volume.

ALCUNI FRAMMENTI of *TROMBICULA MINOR*, Berlese 1912.



none on the trochantera, 13 on the femur, 18 on the genu, 6 on the tibia and 9 on the tarsus. The tarsal gross formula, fT = 9B.5S. The tibia possesses a well pointed, slightly curved terminal claw, single pronged; on its internal side and only one paraglyph (comb) is present, the anterior one, and very close to its base one can distinctly see the empty base of the second and missing paraglyph. The usual paraglyphic seta (nude and straight) is visible on the external side of the tibia.

B. PROPODOSOMA.

Legs : All the segments of leg I are considerably sclerotized.

- a) Sternal plate : rectangular and longer than broad (length 53 μ , width 26 μ), bearing 8 barbed setae of the same nature as those of the four surrounding coxae.
- b) Coxae : the coxal plates are well sclerotized.
Coxa I : very large and covered with about 50 barbed setae ; length 106 μ , width 54 μ .
Coxa II : covered with about 20 barbed setae : much smaller than Coxa I, length 66 μ , width 40 μ .
- c) Trochanterae : The trochantera I is more sclerotized than that of leg II.
Trochantera I : length 54 μ ; width 32 μ ; possess 8 long barbed setae on its anterior and distal edge.
Trochantera II : length 48 μ , width 30 μ ; possess 5 long barbed setae placed anteriorly on its distal edge.
- d) Basi-femur :
Basi femur I : strongly sclerotized segment (wall 5 μ thick) ; length 52 μ , width 24 μ ; covered with about 14 barbed setae.
- e) Telo-femur :
Telo-femur I : strongly sclerotized segment (wall 5 to 6 μ thick) ; length 66 μ , width 40 μ ; covered with 60 to 70 setae among which 8 to 10 are long nude setae (solenidia), and the other 50 to 62 are barbed setae.
Telo-femur II : less sclerotized segment (wall 2 μ thick) ; length 40 μ , width 26 μ ; covered with 30 setae among which one or two are nude solenidia and the others barbed setae.
- f) Genu : Genu I : Very strongly sclerotized segment (wall 6 to 7 μ thick) ; length 82 μ , width 42 μ ; covered with about 120 setae among which are : 20 to 22 very long, thick and striated nude setae or solenidia, 14 to 18 long, slender and non-striated solenidia, 60 to 86 barbed setae.
Genu II : less sclerotized segment (wall 2 μ thick) ; length 40 μ , width 28 μ ; covered with about 50 setae among which 10 are nude, long and slender solenidia and the other 40 are barbed setae.

- g) Tibia I : Strongly sclerotized segment (wall 6 μ thick) ; length 104 μ , width 48 μ ; covered with about 180 or 190 setae, among which about 14 to 18 are long, thick and striated solenidia, 38 to 42 are long, slender and smooth solenidia, 3 to 6 are famuli (micro-spurs) and the other 114 to 135 are barbed setae.
- h) Tarsus I : Strongly sclerotized segment (wall 6 μ thick) ; length 110 μ , width 48 μ ; covered with about 340 to 360 setae among which about 36 to 42 are very long, thick and striated solenidia, 10 are thick and short peglike striated solenidia, 6 to 12 are famuli (micro-spurs), 115 to 130 are long, slender and smooth solenidia, and the other 146 to 192 are barbed setae. The two terminal claws (length 16 μ) of tarsus I are of the pattern usual in *TROMBICULINAE*. They are supported by a small pretarsus.

Taxonomic Comments :

Technically, because of the lack of taxonomically critical parts, e.g. the crista metopica (or dorsal scutum), the body shape, the body setae, the posterior legs (III and IV), the entire leg II, the genital and anal orifices, it is impossible to classify these fragments further than the subfamily level :

TROMBICULINAE

The specimen is a NYMPH as proved by :

- a) the presence of 2 paragyphic spines and 1 paragyphic seta,
- b) the scanty setation of the palpus, the legs, the hypostoma, etc.
- c) the general dimensions and the sclerotization,
- d) the palpo-tarsal formula : $fT = 9B.5S$ which is that of a nymph derived from a larva having a palpo-tarsal formula $fT = 7B.S$, *VERCAMMEN-GRANDJEAN* (1962 a).

The locality is DEPOK near TJIAMPEA and BOGOR in JAVA. The original type described (two specimens on one slide) and drawn by BERLESE came from bat-guano in a cave in TJIAMPEA.

SUMMARY.

Fragments (parts of legs and palp) of an nymphal trombiculid mite from the collection of the Stazione di Entomologia Agraria at Florence, and labelled " 124/14 Trombicula minor Berl. tipico. rotto. Depok, Giava, Kraepelin " are described and illustrated although the fragments are unidentifiable as to genus or species.

It is assumed that these fragments are likely to the "*alcuni frammenti*" mentioned by BERLESE in his redescription in 1912.

He included three or possibly more specimens in his type series : the *alcuni frammenti*, a crumpled specimen (apparently a nymph), and a gravid female. His grounds for assuming that these three were co-specific are absolutely unacceptable nowadays. Fur-

thermore, the fragments now described from DEPOK were collected in a different cave from the original material from TJIAMPEA. WILLMAN in 1940 redescribed the adult female from the type slide and thus virtually designated it lectotype. The lectotype has since been destroyed but the present fragments are wholly unacceptable as a substitute because they lack too many characters essential to taxonomic characterization.

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