

June 1978

A New Species of Podapolipid Mite, and a Redescription of Tetrapolipus Blattae (Oudemans) (Acarina: Podapolipidae)

Robert W. Husband
Adrian College

Follow this and additional works at: <https://scholar.valpo.edu/tgle>



Part of the [Entomology Commons](#)

Recommended Citation

Husband, Robert W. 1978. "A New Species of Podapolipid Mite, and a Redescription of Tetrapolipus Blattae (Oudemans) (Acarina: Podapolipidae)," *The Great Lakes Entomologist*, vol 11 (2)

DOI: <https://doi.org/10.22543/0090-0222.1327>

Available at: <https://scholar.valpo.edu/tgle/vol11/iss2/4>

This Peer-Review Article is brought to you for free and open access by the Department of Biology at ValpoScholar. It has been accepted for inclusion in *The Great Lakes Entomologist* by an authorized administrator of ValpoScholar. For more information, please contact a ValpoScholar staff member at scholar@valpo.edu.

**A NEW SPECIES OF PODAPOLIPID MITE, AND
A REDESCRIPTION OF *TETRAPOLIPUS BLATTAE* (OUDEMANS)
(ACARINA: PODAPOLIPIDAE)**

Robert W. Husband¹

ABSTRACT

A description of a new species of podapolipid mite, *Tetrapolipus oudemansi*, associated with the Philippine cockroach, *Panesthia angustipennis* (Illiger) is presented. *Tetrapolipus blattae* (Oudemans 1911) collected from *P. angustipennis* from Java is redescribed.

Tetrapolipus blattae (Oudemans 1911), described from a single larviform female, was placed by Oudemans in the genus *Pediculoides*. No mention was made of this species when the family Podapolipidae was erected by Oudemans (1931). Vitzthum (1943) first used the combination *Tetrapolipus blattae* and reports the species from both *Panesthia angustipennis* and *Periplaneta australasiae* collected from Java. In an attempt to find males and adult females, the specimens of cockroaches examined by Oudemans were re-examined and an additional specimen was found. A specimen of *P. angustipennis* from the Philippines yielded a new species here described as *Tetrapolipus oudemansi* in tribute to the numerous contributions to acarology made by Dr. Oudemans. *Tetrapolipus blattae* (Oudemans 1911) is redescribed and compared with *T. oudemansi*. An undescribed species of *Tetrapolipus* from *P. australasiae* from Java is briefly mentioned as it is probably the one which lead Vitzthum (1943) to change *Pediculoides blattae* to *Tetrapolipus blattae*.

MATERIALS AND METHODS

Pinned cockroaches were placed in individual beakers of distilled water and heated to approximately 50°C. for one half-hour. They were removed, placed over a Petri dish and washed with 70% alcohol administered from a tube inserted in a plastic squeeze bottle. Mites were removed from the Petri dish and placed in 70% alcohol in vials for storage. Some mites were placed on slides in Hoyer's mounting medium and placed on a slide warmer for a minimum of 24 hours. Mites were examined and drawn with the aid of a Wild-Heerbrug phase contrast microscope with a drawing attachment. Some specimens were placed on double stick tape on aluminum studs, gold coated, and examined with a Hitachi HHS-2R scanning electron microscope at 20 kV. Terms used by van der Hammen (1970) for Tarsonemidae and modified by Regenfuss (1974) for Podapolipidae have been incorporated, in part.

Tetrapolipus oudemansi new species
(Figs. 1-5)

MALE: (Figs. 1, 2). Idiosoma 112 μ m long, 92 μ m wide. Gnathosoma: 30 μ m long, 23 μ m wide; gnathosomal setae very short, palps relatively well developed. Chelicerae 13 μ m long. Propodosoma with three pairs of short setae; aedeagus located in anterior 3/4 of metapodosoma. Each coxal plate with a single short seta; coxae III in contact medially. One spine on tibia I, 2 spines on tibiae II, III. Two dorsal blunt setae on tarsus I, no solenidion on tibia I. Fourth pair of legs absent. Leg chaetotaxy as in Table 1.

¹Department of Biology, Adrian College, Adrian, MI 49221.

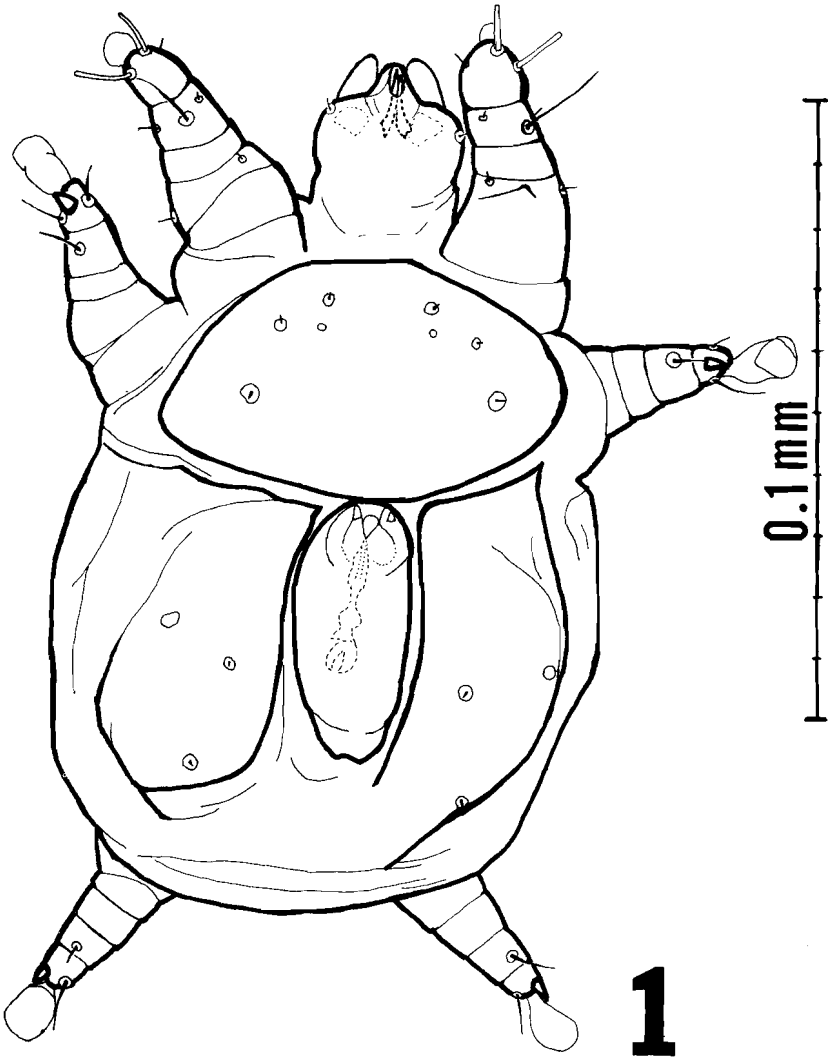


Fig. 1. *T. oudemansi* n.sp. Dorsum of male.

LARVIFORM FEMALE: (Figs. 3, 4). Idiosoma 148 μm long, 105 μm wide. Gnathosoma: 40 μm long, 49 μm wide; ventral gnathosomal setae less than 1/4 width of gnathosoma; dorsal gnathosomal setae ca. 1/3 width of gnathosoma; chelicerae 61 μm long. Propodosoma broader than long with three pairs of setae, posterior pair longest. Metapodosomal plates 1 & 2 partially fused, three pairs of short setae. Opisthosomal plate 1 with 1 pair of short setae. Opisthosomal plate 2, ventral, with two pairs of setae; lateral pair short, medial pair more than 1/2 width of idiosoma. Coxae I, II fused, separated from coxae



Fig. 2. *T. oudemansi* n.sp. Venter of male.

III; coxae III separated medially, each coxal plate with a single short setum. No tibial spines. Two dorsal blunt setae on tarsus I, no solenidion on tibia I. Leg chaetotaxy as in Table I.

FEMALE: (Fig. 5). Idiosoma 268 μm long, 195 μm wide. Gnathosoma 49 μm long, 35 μm wide; Chelicerae 42 μm long. Idiosoma without plates or setae. Posterior ventral genital opening extends 1/3 the distance of the ventral surface. One pair of legs; tarsi with three setae, a medial stout spine and a terminal sucker.

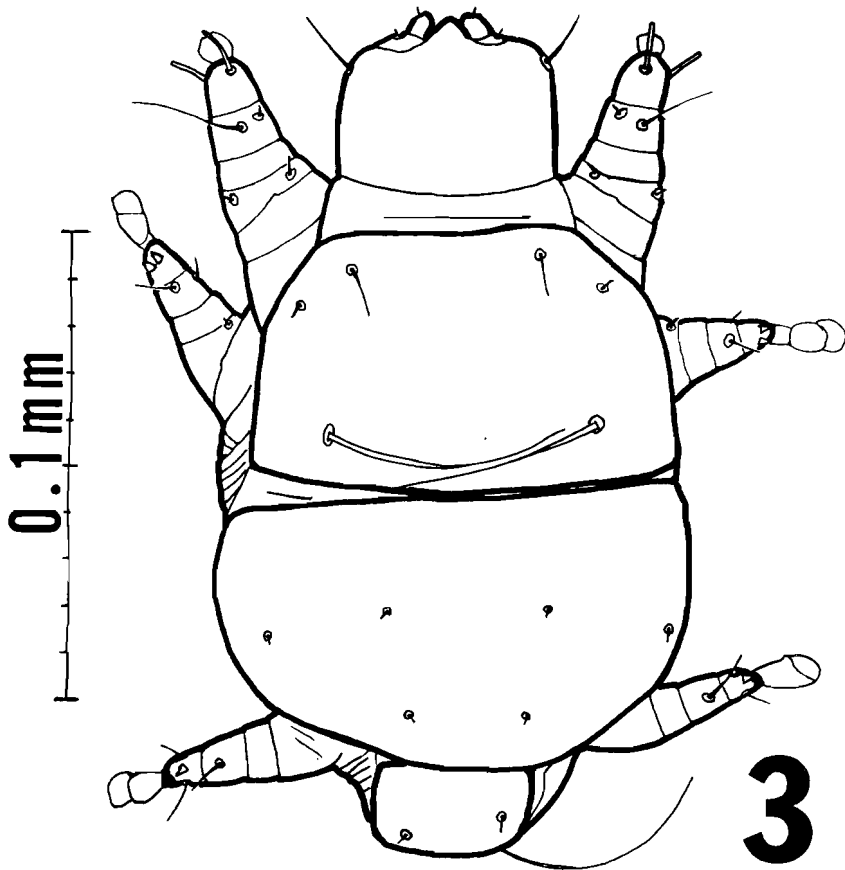


Fig. 3. *T. oudemansi* n.sp. Dorsum of larviform female.

EGG: 177 μ m long, 82 μ m wide; smooth, oval.

Type data: All collected from *Panesthia angustipennis* (Illiger) (Orthoptera: Blaberidae). Holotype, male, Balbalaan, Kalinga, Luzon, Philippines; March, 1918, by W. Boettcher; allotype, larviform female, same data. Paratypes: 11 adult females, 9 larviform females, 3 males, 2 eggs. Holotype, allotype, and adult female paratype deposited in Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands. Additional male, larviform female, female, and egg paratypes deposited in the Acarology Collection, Biology Department, Adrian College, Adrian, Michigan.

Tetrapolipus blattae (Oudemans)
(Fig. 6)

Pediculoides blattae in Oudemans (1911, 1912, 1915): as *Tetrapolipus blattae* in Vitzthum (1943), Naudo (1967), Regenfuss (1968). Type locality: from *Panesthia angustipennis* (Illiger) (Orthoptera: Blaberidae), East Java, Coll. MacGillavry.

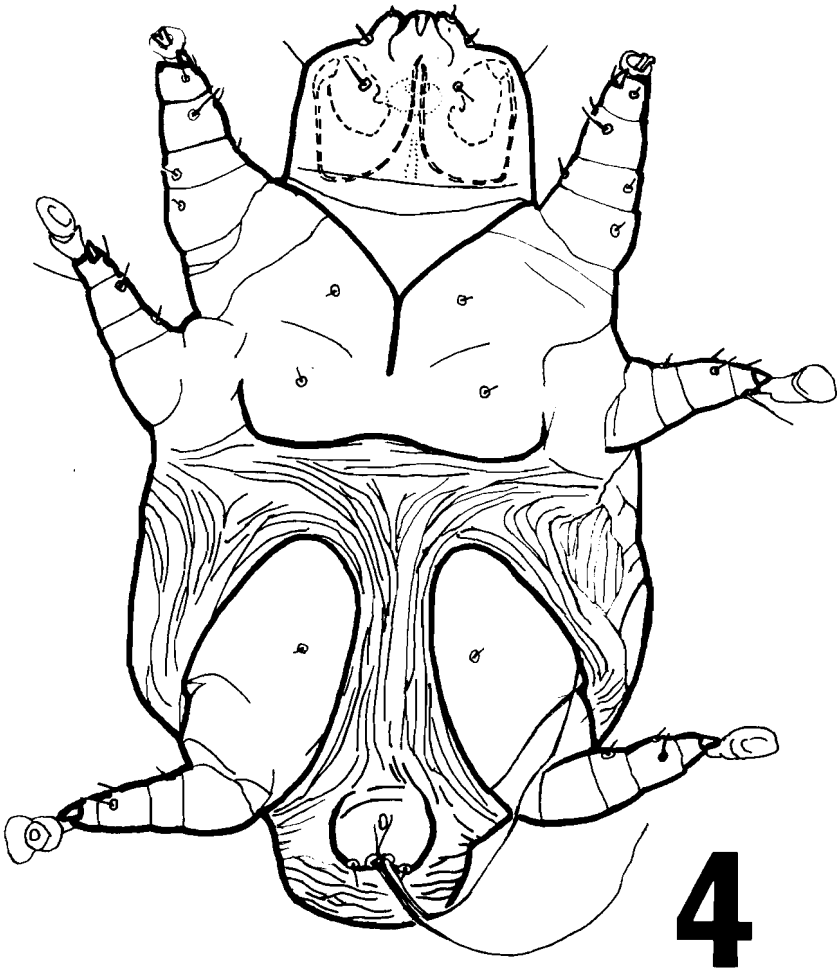


Fig. 4. *T. oudemansi* n.sp. Venter of larviform female.

Vitzthum reported *T. blattae* from *Periplaneta australasiae*. This report is probably in error as specimens collected from *P. australasiae* from Java and located in the Leiden Museum yielded a new species of *Tetrapolipus* which is not closely related to *T. blattae*. A second larviform female *T. blattae* has been collected from the specimen of *P. angustipennis* which yielded the type specimen. These specimens resemble the first described *Tetrapolipus*, *Tetrapolipus batoceræ* (Berlese, 1910, 1911). When adult females of *T. blattae* are found, they will probably have two legs as does *T. oudemansi*. Rather than proliferating more new genera, I choose to leave both species with the other species of *Tetrapolipus* in which larviform females have very long chelicerae.

LARVIFORM FEMALE: (Fig. 6). Idiosoma 269 μm long, 181 μm wide. Gnathosoma 90 μm long, 78 μm wide; ventral gnathosomal setae slender, more than 1/2 width of

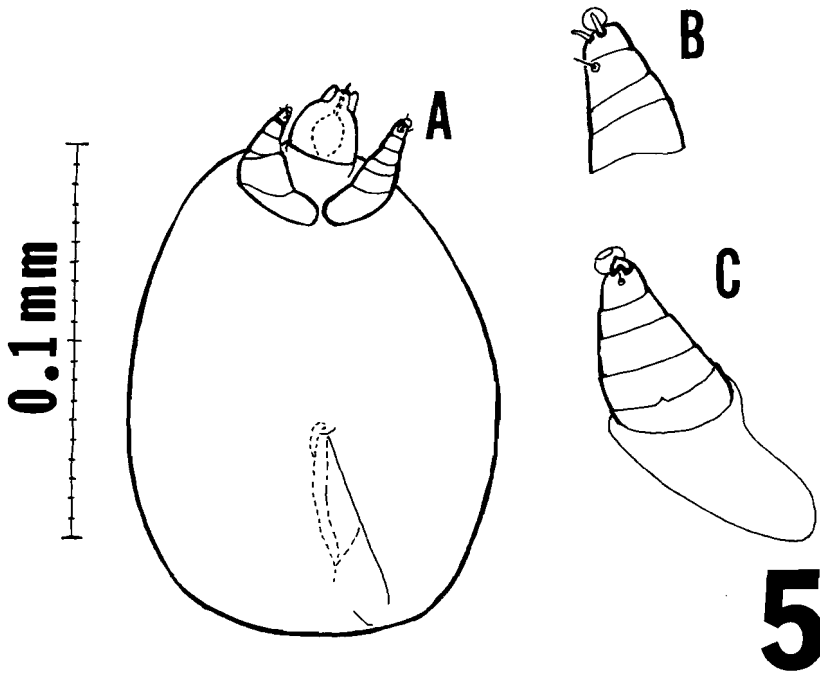


Fig. 5. *T. oudemansi* n.sp. A. Venter of adult female. B. Dorsum of leg I. C. Venter of leg I.

Table I. Leg chaetotaxy of *Tarsopolipus oudemansi*

	Male			
Leg I	$0 \frac{1}{1} - 1$	$1 \frac{0}{1} - 0$	$1 \frac{2}{1} - 1$	$1 \frac{2}{3} - 1$
Leg II	$0 \frac{0}{0} - 0$	$1 \frac{0}{0} - 0$	$1 \frac{1}{1} - 0$	$2 \frac{1}{1} - 1$
Leg III	$0 \frac{0}{0} - 0$	$1 \frac{0}{0} - 0$	$0 \frac{1}{2} - 0$	$2 \frac{0}{2} - 1$
	Larviform Female			
Leg I	$0 \frac{1}{1} - 1$	$1 \frac{0}{1} - 0$	$1 \frac{2}{1} - 0$	$1 \frac{2}{2} - 0$
Leg II	$1 \frac{0}{0} - 0$	$1 \frac{0}{0} - 0$	$1 \frac{1}{1} - 0$	$1 \frac{2}{1} - 1$
Leg III	$0 \frac{0}{0} - 0$	$1 \frac{0}{0} - 0$	$1 \frac{1}{1} - 0$	$1 \frac{1}{1} - 1$

gnathosoma; dorsal gnathosomal setae more than 1/2 width of gnathosoma; chelicerae 148 μm long. Propodosoma with three pairs of setae, posterior pair longer than 1/2 width of idiosoma. Metapodosomal plates 1 & 2 partially fused, three pairs of setae.

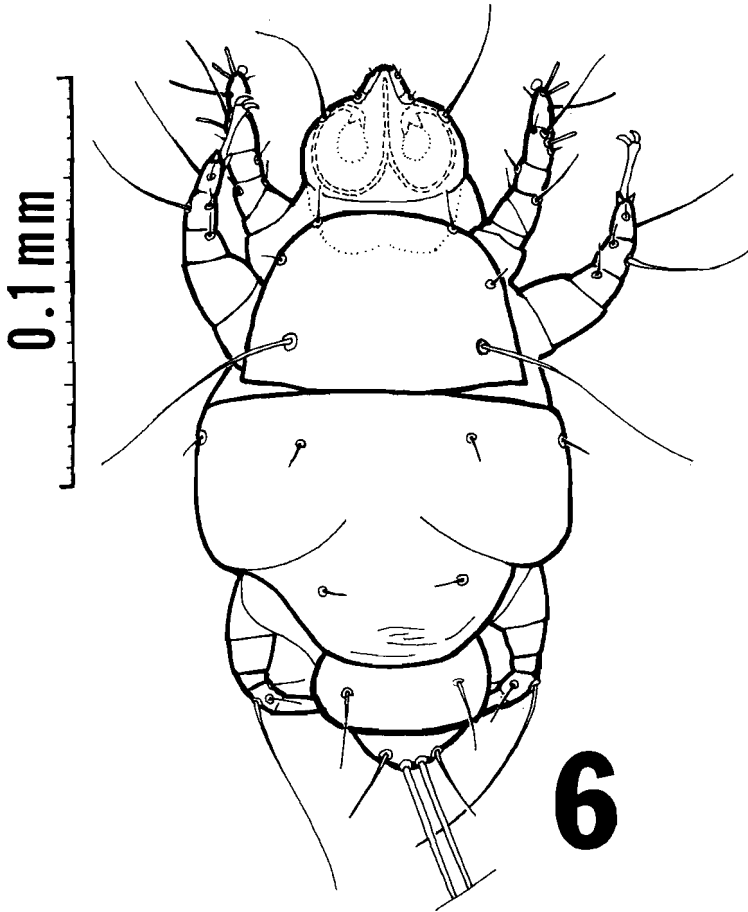


Fig. 6. *T. blattae* (Oudemans 1911) Dorsum of larviform female.

Opisthosomal plate 1 with a pair of long thick setae, Opisthosomal plate 2, ventral, with two pairs of setae; lateral pair moderately long and thick, medial pair longer than width of idiosoma. Coxae I, II fused, separated from coxae III; coxae III separated medially, each coxal plate with a single short slender setum. No tibial spines. Tarsus I solenidion (ω) equal to width of tarsus in one specimen, shorter in the second specimen. Tibial solenidion (ϕ) about equal to the width of the tibia.

DISCUSSION

The larviform females of *T. blattae* and *T. oudemansi* have very long chelicerae, well developed palpi, partial or complete fusion of metapodosomal plates I and III, conspicuous caudal assessor setae, and both are parasites of *Panesthia angustipennis*.

Many of the setae on the idiosoma of *T. oudemansi* are shorter than in *T. blattae*. *T. oudemansi* lacks solenidia on tarsus and tibia I. *T. blattae* was collected on the east coast of Java while *T. oudemansi* was collected on Luzon in the Philippines.

The specimens of *Tetrapolipus* from the Leiden Museum from *Periplaneta australasiae* are probably those viewed by Vitzthum (1943). Vitzthum reports *T. blattae* from *P. australasiae* collected from Java. These mites have four legs in the adult female and resemble *Tetrapolipus* in other respects. However, the aedeagus is unique in originating more forward and extending more forward than does the aedeagus of other *Tetrapolipus*.

The genus *Tetrapolipus* and those related mites in which adult females have two pairs of legs have been discussed by Regenfuss (1973) and Feldman-Muhsam (1977). *Tetrapolipus* includes mites in which adult females have only one pair of legs if one includes *Coccipolipus* with *Tetrapolipus*. Due to differences in all three stages and particularly the smaller chelicerae of larviform females, I prefer to continue to refer to *Coccipolipus* as a separate genus. *Coccipolipus* has adult females with either two or four legs. As Feldman-Muhsam (1977) suggests, in most species considered *Tetrapolipus* the aedeagus at least originates at or near the anterior border of the metapodosoma. Genera which have the characteristic aedeagal position and very long chelicerae include *Tetrapolipus*, *Podapolipoides*, *Rhynchopolipus*, *Bakerpolipus* and *Stigmacarus*. *Rhynchopolipus* and *Stigmacarus* are associated with the weevil family Curculionidae, *Podapolipoides* has been found only on grasshoppers, and *Bakerpolipus* has been found on cockroaches (Blaberidae). *Tetrapolipus, sensu strictu*, has been found on Cerambycidae, Curculionidae and on four species of cockroaches. It is likely that the genus *Tetrapolipus* may eventually be restricted to only those mites from the beetle families. However, with only seven species (including three undescribed), there is not sufficient material for restructuring the generic concept at this time.

ACKNOWLEDGMENTS

I wish to thank Dr. Richard Crang and Martha Bushlow of Bowling Green State University for providing help with electron microscopy; the staff of the Leiden Museum of Natural History for loaning type specimens of mites as well as a number of cockroaches from Java; and Dr. David Rentz of the Academy of Natural Sciences of Philadelphia for loaning a large number of *P. angustipennis*.

LITERATURE CITED

- Berlese, A. 1910. Lista di nuove specie e nuove generi di Acari. Redia, 6:270-272.
 ————. 1911. Acarorum species novae quindecim. Redia 7:429-435.
 Feldman-Muhsam, B. and Y. Havivi. 1977. *Stigmacarus lukoschusi*, new genus and new species (Acarina: Podapolipidae) from beetles in Italy. Acarologia 18:545-552.
 Hammen, L. Van der. 1970. *Tarsonemoides limbratus* nov. spec., and the systematic position of the Tarsonemida (Acarida). Zool. Verh. 108:3-35.
 Naudo, M. H. 1967. Contribution à l'étude des acariens parasites d'orthoptères malgaches. I. Le genre *Podapolipus* (Podapolipidae): diagnoses préliminaires d'espèces nouvelles. Acarologia 9:30-54.
 Oudemans, A. C. 1911. Acarologische aantekeningen XXXVIII. Entomol. Bericht., 3:187.
 ————. 1912. Tijds. Ent. 55:XXVI-XXX.
 ————. 1915. Notizen über Acari, XXIII. Riehe Archiv Naturgesch. 81A:41-44.
 ————. 1931. Acarologische aantekeningen CXI. Entomol. Bericht. 8:327.
 Regenfuss, H. 1968. Untersuchungen zur morphologie, systematic and ökologie der Podapolipidae (Acarina: Tarsonemini). A. Wiss. Zool., 177:182-282.
 ————. 1973. Beinreduction and verlagerung des kopulationsapparates in der milbenfamilie Podapolipidae, ein beispiel für verhaltensgesteuerte evolution morphologischer strukturen. Z. f. zool. Systematik u. Evol. 11:173-195.
 ————. 1974. Neue ketoparasitische arten der familie Podapolipidae (Acari: Tarsonemina) von carabiden. Mitt Hamburg. Zool. Mus. Inst. 71:147-163.
 Vitzthum, H. G. 1943. Acarina. In Bronn's, Klassen and Ordnungen des Tierreichs. 5(4. Abt. 5).