A NEW GENUS *CUNABDELLA* (PROSTIGAMATA : ACARI) WITH A DESCRIPTION OF A NEW SPECIES FROM THE ETHIOPIAN REGION

BY

J. DEN HEYER *

Institute for Zoological Research, Department of Zoology, P.U. for C.H.E., Potchefstroom, R.S.A.

SUMMARY.

On the basis of differences in the generic characteristics with *Bonzia* Oudemans, 1927, a new genus is created and the name *Cunabdella* gen. nov. is proposed to include *Bonzia* (= *Cunabdella*) *bdelliformis* Atyeo, 1958 and a new species from the Ethiopian region, *Cunabdella marthae* spec. nov.. A description of the latter is given.

ZUSAMMENFASSUNG.

Auf Grund von Unterschieden in den Gattungsmerkmalen zu *Bonzia* Oudemans, 1927, entsteht eine neue Gattung, für die Bezeichnung *Cunabdella* gen. nov. vorgeschlagen wird, um *Bonzia* (= *Cunabdella*) *bdelliformis* Atyeo, 1958 und eine neue Art aus der Ethiopischen Region *Cunabdella marthae* spec. nov. unterzubrigen. Eine Beschreibung von letztgenannter erfolgt.

INTRODUCTION.

ATYEO (1958) described *Bonzia bdelliformis* as a new species from North America and regards it as being intermediate between *Cunaxa* von Heyden, 1826 and *Bonzia* Oudemans, 1927. He mentions further the genus characteristics of *Bonzia*, as defined for the species *B. halacaroides* Oudemans, 1927 and *B. sphagnicola* Willmann, 1937 by THOR & WILLMANN (1941) and BAKER & HOFFMANN (1948). He states that, with regard to these genus characteristics, *B. bdelliformis* resembles the other *Bonzia* spp. only in the presence of a many-branched spine of the palpal telofemur. He also remarks that *B. bdelliformis* may be an aberrant *Cunaxa*.

The opposite is indicated by the discovery of related forms from the Ethiopian region : it is the author's opinion that, because of the differences mentioned below, it is advisable to erect a new genus. The name *Cunabdella* gen. nov. is proposed on the grounds of the bdellid and cunaxid features combined in these forms. This genus will contain *Cunabdella bdelliformis* (Atyeo) 1958 comb. nov. and the Ethiopian species, *Cunabdella marthae* spec. nov. with the former as the type species of the genus.

The characteristics which separate this genus from *Bonzia* Oudemans, 1927 (as discussed by BAKER & Hoffmann, 1948 ; THOR & WILLMANN, 1941 ; WILLMANN, 1939, 1949 and 1950) are the following :

* Present Address : Dept. of Zoology, University of the North, P. O. Sovenga, R.S.A.

I) the chelicerae taper gradually towards the chelae and their bases are relatively narrower than those of *Bonzia* Oudemans, 1927 ;

II) the hypognathum is provided with six pairs of setae instead of four pairs as in *Bonzia* Oudemans, 1927 ;

III) the absence of geniculate setae ;

IV) the palps are considerably longer than the chelicerae, bear terminally strong long setae and a solenidion, i.e. they have a typical bdellid form ;

V) apodemes between anterior sensilla absent ;

VI) the absence of eyes ;

VII) the venter is not covered by an entire shield but the coxae are arranged in four groups of two each of which the anterior coxal groups may be fused to one another by a ventral propodosomal shield (sternal shield) ;

VIII) the presence of a setose trichobothrium on tibiae IV.

Genus Cunabdella gen. nov.

Bonzia bdelliformis Atyeo, 1958.

These mites are characterised by a distinctly five-segmented palp which extends beyond the apex of the hypostome, possessing a many-branched spine on the telofemur and strong long setae on the tibiotarsus which are bdellid-like ; the chelicerae taper gradually towards the chelae and have relatively narrow bases ; the hypognathum is provided with six pairs of ventral setae but without geniculate setae. They possess two dorsal shields which are not sharply demarcated from the rest of the integument ; an apodeme between the anterior sensilla is lacking, and eyes are absent ; setae in the dorsocentral (dc) series are six in number and in the dorsolateral (dl) series four (fig. 1). The venter with the coxae arranged in four groups of two each ; the genital region with a pair of internal genital setae covered by the two genital shields, each of which possesses more than four genital setae. The legs are typically cunaxid ; the tibiae IV, however, possess setose trichobothria and the basifemurs are separated from the telofemurs by movable joints ; no lateral processes present on the apices of the tarsi flanking the ambulacra.

Type species : *Bonzia bdelliformis* Atyeo, 1958.

Cunabdella marthae spec. nov.

The natural colour is unknown. The body form, when mounted, is oval but striations indicate that a constriction, the sejugal groove, is present between the propodosoma and hysterosoma. The broadest part of the body is at coxae III.

This species closely resembles *Cunabdella bdelliformis* (Atyeo) 1958, but differs mainly in that the hypostome is more drawn out and funnel-shaped, the posterior hypostomal setae are situated between the palpal trochanters, the bulbous solenidion on the palpal tibiotarsus is rela-

tively longer and the sigmoid setae are plumose. The setae dc 2 are also closer together, i.e. the distance between their bases is shorter than that between the bases of dc 2 and d1 2. The genital shield bears only seven setae, arranged in two rows consisting of five and two setae respectively.

Female (figs. 1-16).

Dimensions : length of body (anus to apex of hypostome) 433 μm ; length of body (gnathosoma excluded) 305 μm ; length of legs (coxae excluded) I 163 μm ; II 149 μm III 178-180 μm, IV 194-199 μm ; length of longest palp seta 48 μm ; length of plumose sigmoid seta 20-22 μm ; length of palpal solenidion 9 μm ; length of palp (setae excluded) 113-115 μm ; length of hypognathum 127 μm ; length of chelicerae 122-127 μm ; width of body (mounted) 168-182 μm.

Dorsum (figs. 1-3). The schematic drawing (fig. 1) shows the chaetotaxy of the dorsum. The propodosoma and hysterosoma are each provided with a shield (fig. 2). These are not sclerotized or sharply demarcated from the surrounding integument and both are provided with papillae of varying size.

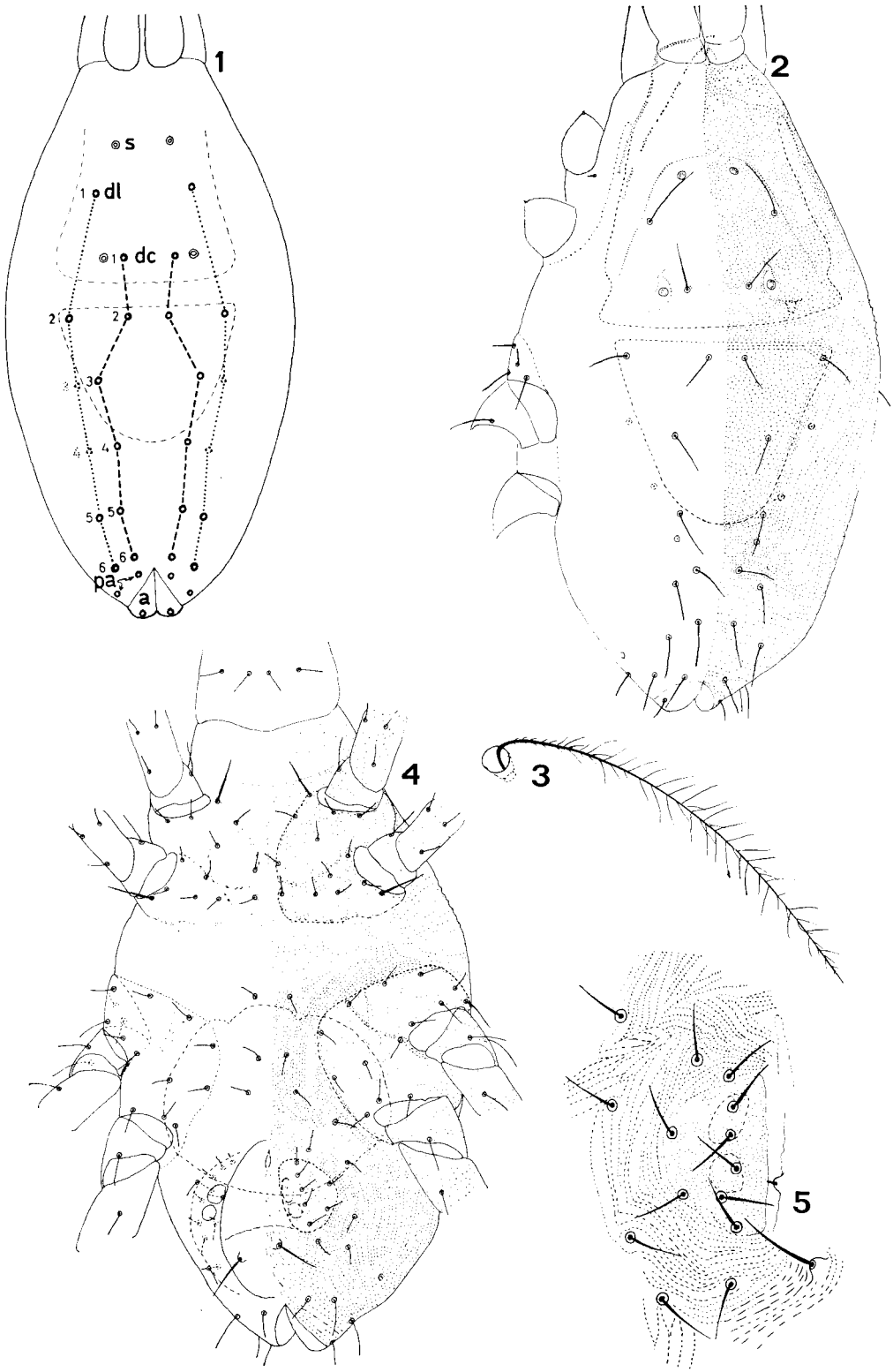
Anterolaterally the propodosomal shield seems to be continuous with the anterodorsal parts of the coxal shields of legs I & II. Anteriorly it has no definite edge but gradually merges with the integument behind the chelicerae. Two pairs of setose sensilla (fig. 3) and two pairs of simple tactile setae, dl 1 and dc 1, are present. The latter setae are situated as follows : one pair just anterior to halfway the distance between the anterior and posterior sensilla and just lateral to the line connecting them while the other pair occurs between the posterior sensilla. Eyes are lacking.

The hysterosomal shield bears two transverse rows of simple tactile setae. The anterior row consists of lateral setae dl 2 and between them setae dc 2 while the second row is formed by setae dc 3. Figs. 1 and 2 indicate that the integument also bears simple tactile setae : one pair of setae, dc 4, just off the rounded posterior edge of the hysterosomal shield, and two transverse rows consisting of setae dl 5 and dc 5 and dl 6 and dc 6. All integumentary setae are borne on unstriated plate-like areas. The integument is patterned with continuous striations bearing papillae. The striation pattern is indicated in fig. 2. Three pairs of cupules are present on the hysterosoma as shown in fig. 2.

Venter (figs. 4 & 5). The coxae are arranged in four groups of two each (fig. 4). The coxae of legs I & II of both sides are linked by a shield to form one sternal shield which bears 13 pairs of simple tactile setae of which the anterior pair and the posterolateral pair are longer and thicker than the others.

The sternal shield also bears a pair of blunt-pointed pegs dorsally to the attachment of leg I (fig. 2). The coxae are demarcated on the coxal (sternal) shield by darker lines which seem to be subsurface because the punctuation is not interrupted externally. The anterior coxal shield (sternal shield) is separated from the coxal shields of legs III & IV by a strip of striated integument where the sejugal groove is supposed to be. The coxae of legs III & IV of each side are fused to form a shield bearing 14 simple tactile setae. These shields reach up laterally to such an extent that on a mounted specimen parts may be visible in a dorsal position. Two pairs of simple ventral setae occur on the integumentary strip separating these coxal shields.

The genital region (fig. 5) is characterised by the presence of two genital plates having papillae irregularly placed, each plate bearing seven genital setae. These plates border the slit-like genital



FIGS. 1-5 : *Cunabdella marthae* gen. et spec. nov. 1) Chaetotaxy of dorsum (schematic) ; 2) dorsum ; 3) anterior propodosomal sensillum ; 4) venter 5) genital region.

aperture, the opening to the genital vestibule. Each wall of this vestibule has a pair of unequal genital suckers with the anterior one on each wall the larger. Medially to each posterior sucker is a small peg situated on a little protuberance, similar to those found in the Bdellidae. A pair of internal genital setae on protuberances is present near the posterior rim of the genital aperture. Seven pairs of simple paragenital setae are present. The size of the egg (96 × 115 μm) is shown in fig. 4.

The anal region is situated in a posterodorsal position. It comprises the anal cleft bordered laterally by two anal valves which are not sclerotized and have one anal seta in the dorsal half of each valve. On the lateral side of each anal valve are four simple para-anal setae, all situated on unstriated plate-like areas. A pair of cupules is present laterally to the para-anal setae.

The integument of the venter is provided with papillae-bearing striations of which the pattern is shown in figs. 4 and 5.

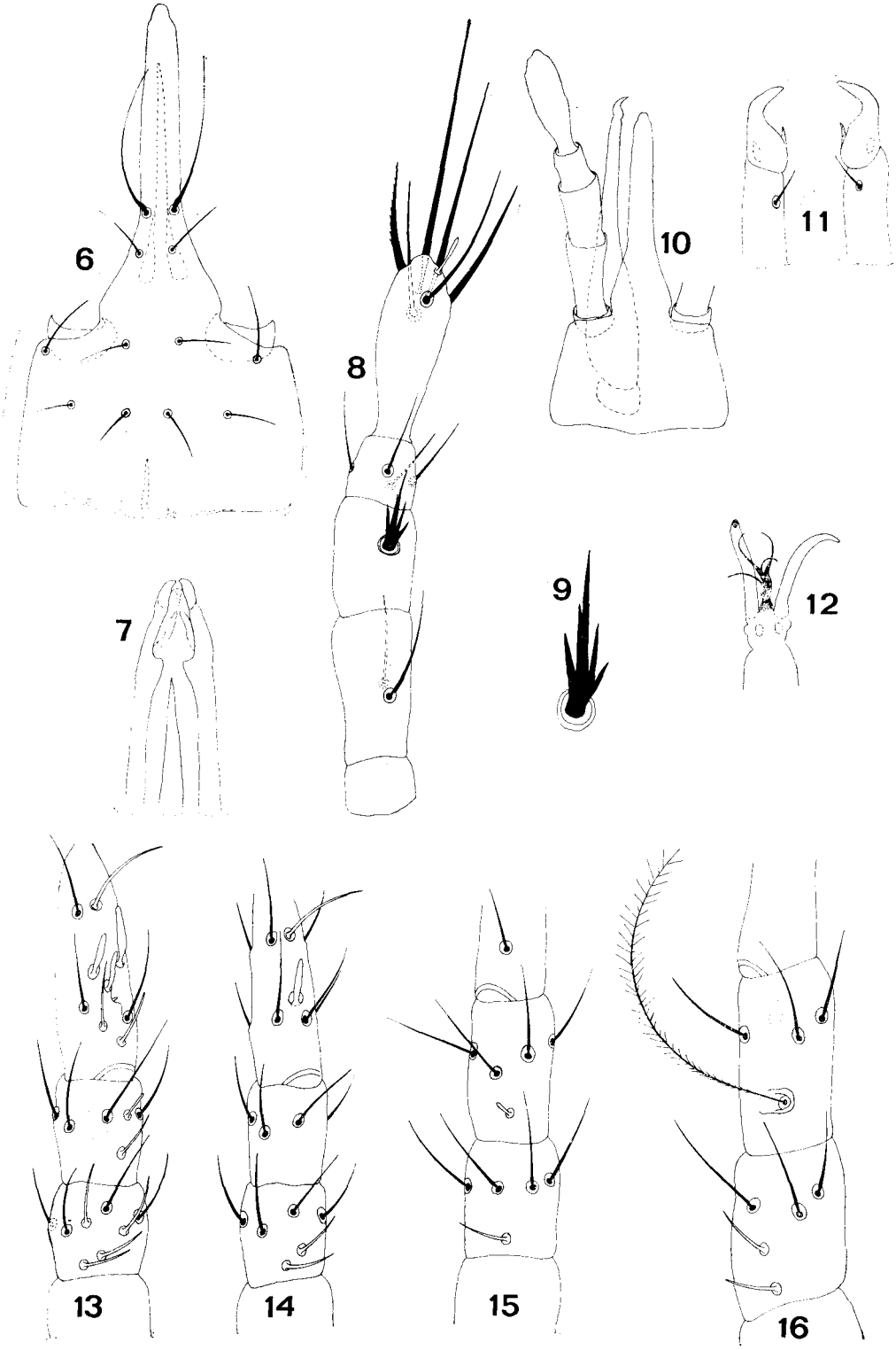
Gnathosoma (figs. 6-11). The hypognathum is characterized by the presence of six pairs of simple tactile setae, two pairs of which are situated on the funnel-shaped hypostome (fig. 6). Of the latter setae the posterior pair is the shorter, the anterior pair is relatively long, almost reaching to the apex of the hypostome. The apex of the hypostome is provided with two dorsal, fleshy lobes or lateral lips (fig. 7). The labrum-epipharynx is long and sharp-pointed. The pegs near the cheliceral bases could not be located. The hypognathum is provided with papillae on the coxal region which extend forward ventrally to just in front of the anterior hypostomal setae.

The palps (fig. 8) are clearly five-jointed ; the terminal segment is club-shaped as in the Bdellidae, the typical cunaxid claw being absent. The segments are, except for a few dorsal regions, supplied with integumentary papillae. The chaetotaxy of the palp is as follows : trochanter, none ; basifemur, one long simple seta dorsally and a shorter one ventrolaterally ; telofemur, dorsally one many-branched (4-6) spine (fig. 9) ; genu, four simple tactile setae around the segment ; tibiotarsus (with all setae on the anterior quarter), one simple tactile seta dorsally near the apex, one simple tactile seta ventrally near the apex, one strong seta laterally near the apex, one plumose sigmoid seta medially near the apex (plumose only on the median side of the seta), one elongated blunt-pointed solenidion apically and two simple, relatively strong tactile setae of unequal length apically. The palps extend past the apex of the hypostome (fig. 10).

The chelicerae (fig. 10) extend just past the apex of the hypostome. They are broadest just anterior to their basal parts. Each consists of three parts : the short basal posterior part, the long middle part tapering gradually anteriad and bearing on its distal part a small short simple dorsolateral seta, and the terminal chela (fig. 11) which consists of a movable ventral claw-like digit and a short dorsal projection. The posterodorsal part of the chelicerae are supplied with papillae.

Legs (figs. 12-16.) All legs are shorter than the body. The coxae have been discussed already. All basifemurs are distinctly separated from the telofemurs by movable joints. All segments are provided with integumentary papillae. The tarsi taper rather sharply towards the ambulacra. The latter consist of two large plain claws and between them a four-rayed empodium (fig. 12).

The chaetotaxy of the legs is as follows : coxae I-IV, 6 — 7 — 7 — 7 simple tactile setae ; trochanters I-IV, 1 — 1 — 2 — 1 simple tactile setae ; basifemurs I-IV, 4 — 7 —3 — 2 simple tactile setae ; telofemurs I-IV, 5 — 5 — 4 — 3 simple tactile setae ; genu I, 4 antennuate solenidia and 5 simple tactile setae ; genu II, 2 antennuate solenidia and 5 simple tactile setae ; genu III, 1 antennuate solenidion and 6 simple tactile setae ; genu IV, 2 antennuate solenidia and 6 simple



FIGS. 6-16 : *Cunabdella marthae* gen. et spec. nov. 6) Venter of gnathosoma ; 7) dorsum of hypostome ; 8) dorsal aspect of palp ; 9) many-branched spine ; 10) gnathosoma ; 11) chelae ; 12) ambulacrum ; 13) leg. I ; 14) leg II ; 15) leg III ; 16) leg IV.

tactile setae ; tibia I, 1 antennuate and 1 blunt-pointed rod-like solenidia and 5 simple tactile setae ; tibia II, 6 simple tactile setae ; tibia III, 1 blunt-pointed rod-like solenidion and 6 simple tactile setae ; tibia IV, 1 long setose trichobothrium and 5 simple tactile setae ; tarsus I, 2 antennuate solenidia, 3 rod-like blunt-pointed solenidia (largest distally), 1 microsensillum in a pit, 1 hollow simple antennuate dorsoterminal seta and 18 simple tactile setae ; tarsus II, 1 blunt-pointed rod-like solenidion, 1 hollow simple dorsoterminal antennuate seta and 18 simple tactile setae ; tarsus III, 16 simple tactile setae ; tarsus IV, 14 simple tactile setae.

Remarks : When one studies the specimens of the new species or looks at the drawings of Atyeo (1958) one is struck by the bdellid form of this group. It does not stop there. Quite a number of features, such as the palp, the internal genital setae, the number of external genital setae, the peg near the genital sucker and the number of coxal setae, force one to acknowledge how close this genus is related to the Bdellidae. In fact, it could be regarded as very suitable transitional form between the two families. More material will have to be studied, however, to come to a definite conclusion. It must be emphasised, however, that the main features are still those of the Cunaxidae.

This new species is named in honour of my wife Martie.

Material studied :

♀ -Holotype and one ♀-paratype collected from soil rich in organic material under willows on the bank of a stream near Bodenstein, Western Transvaal, on 20 January 1974 by the author.

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LITERATURE CITED

Atyeo (W. T.), 1958. — The genus *Bonzia* in the new world (Acarina, Cunaxidae). — J. Kansas Ent. Soc., vol **31** (12) : 173-177.

Baker (E. W.) & (Anita) Hoffmann, 1948. — Acaros de la familia Cunaxidae. — Anales de la Escuela Nacional de Ciencias Biologicas (Mexico), **5** (3-4) : 239-273. 10 pls.

Thor (Sig)& Willmann (C.), 1941. — Acarina. Prostigmata 6-11 (Eupodidae, Penthalodidae, Pentha leidae, Rhagidiidae, Pachygnathidae, Cunaxidae). — Das Tierreich, **71** a : 164-186. 28 figs.

Willmann (C.), 1939. — Die Moorfauna des Glatzer Schneeberges. 3. Die Milben des Schneeberg moore· — Beitr. Biol. Glatzer Schneeberges, **5** : 427-458.

— 1949. — Über eine Milbenausbeute aus dem Naturschützgebiet « Verlorenen Wasser ». — Abh. Naturw. Ver. Brem., **32** (2) : 339-348.

— 1950. — Milben aus Mineralquellen. — Zool. Anz. **145** (7-8) : 186-195.