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TWO NEW MITES OF THE RARE FAMILIES BARBUTIIDAE AND LINOTETRANIDAE (ACARI), FROM THE NAMIB DESERT

by Henri M. ANDRÉ *

ACARI
NAMIB DESERT
NAMIBIA
SOIL

SUMMARY: Two new actinedid mites are described from the gravel plain of the Namib desert: Namibarbutia seelyae n. gen., n. sp. (Barbutiidae) and Linotetranus mirabebensis n. sp. (Linotetranidae). The definitions of the genus Barbutia and the family Barbutiidae are modified accordingly. Identification keys are provided for both families. The high value of the ratio length-width of the new species is related to habitat.

ACARIENS
DÉSERT DU NAMIB
NAMIBIE
SOIL

RéSUMÉ: Deux nouveaux acariens Actinedida sont décrits de la plaine à gravier du désert du Namib : Namibarbutia seelyae n. gen., n. sp. (Barbutiidae) ainsi que Linotetranus mirabebensis n. sp. (Linotetranidae). Les définitions du genre Barbutia et de la famille des Barbutiidae sont modifiées en conséquence. Une clé d'identification des espèces de chaque famille est donnée. La valeur élevée du rapport longueur-largeur des nouvelles espèces est liée à l'habitat.

INTRODUCTION

Although the peculiarity of the soil fauna of the Namib desert was stressed as early as 1977 by COINEAU and MASSOU, and again outlined by COINEAU and SEELEY (1983), only a few mite species have been described from the Namib soils, Microcaeculus namibensis Piff, 1965, Namibacarus sabulosus Fain et al. 1993, and Neotenerifflia coineaui Judson, 1994. The two actinedid mites are surface-dwellers and only the acarid Namibacarus sabulosus belongs to the interstitial fauna outlined by Y. COINEAU.

During a recent survey of the soil microfauna of the Namib desert (ANDRÉ, NOTI & JACOBSON, in prep.), two new mites belonging to the rare families Linotetranidae and Barbutiidae were collected. The family Linotetranidae, created by BAKER & PRITCHARD (1953), is monogenic and comprises only three species, Linotetranus cylindricus Berlese, 1910, L. achrus Baker & Pritchard, 1953 and L. protrac-

tulus Athias-Henriot, 1961. The new species is therefore the fourth of the genus.

The family Barbutiidae is also monogenic and was created by ROBAUX (1975). So far Barbutiidae have comprised only two species, Barbutia anguineus (Berlese, 1910) and B. perretae Robaux, 1975. As the chaetotaxy of the new species collected in the Namib desert differs greatly from that of Barbutia, a second genus is created and the family definition is modified to accommodate it.

The holotypes are deposited in the Musée royal de l'Afrique centrale, Tervuren.

BARBUTIIDAE

The genus Barbutia was proposed by Oudemans (1927) to accommodate Stigmaeus anguineus Berlese, 1910. It was later redefined by Summers (1964)
Fig. 1: Namibarbutia seelyae n. sp.
Lateral view. Leg chaetotaxy incomplete. Setal nomenclature follows Grandjean (1944). Equivalences with other authors are given in table 1 (p. 104).
and ROBAUX (1975). The latter described the second species of the genus, *Barbutia perretae* and created the new family Barbutiidae to accommodate these two species.

Using KETHLEY’S (1990) or KRANTZ’S (1978) keys to identify the new mite, I keyed out Barbutiidae in both cases. However, the new species does not conform to either the family description given by ROBAUX (1975), or the generic definition of the genus *Barbutia*. Consequently, I propose the creation of a new genus, *Namibarbutia*, and enlarge the family definition in such a way as to accommodate this genus.

**Barbutiidae Robaux, 1975**


**Barbutia Oudemans, 1927**


**Namibarbutia n. gen.**

*Type species: Namibarbutia seelyae* n. sp.

*Derivatio nominis:* The name results from the merging of Namib, the desert where the genus was first found, and *Barbutia*.


Body length : 396 μm. Body rather elongate, with long legs in comparison to *Barbutia* (Fig. 1). Stylophore with dorsal, short, cross-chambered peritremata (Fig. 3G). Integument of dorsal face entirely striated longitudinally, except behind setae *b* where striae are transverse (Fig. 2B). Same striation pattern on the ventral face except under the gnathosoma where a granular ornamentation is observed, and at the base of legs where smooth plates are located (Fig. 2A). Some dorsal setae are extremely long : *he, la*, and *c*. Genital aperture
FIG. 3: Namibarbutia seelyae n. sp.

A. — Distal part of leg I (paraxial view) with an insert of the duplex (dd-ap) (antiaxial view); B. — Tarsus and tibia II with an insert of the triplet (tc'-tc''-ft') (antiaxial view); C. — Tarsus and tibia IV (antiaxial view); D. — Apotele IV; E. — Palp (antiaxial view); F. — Tip of the palptarsus (antiaxial view); G. — Neostigma with cross-chambered peritremata (antiaxial view through the stylophore).
ventral. Two pairs of pseudanal setae and three pairs of aggenital setae. Leg chaetotaxy and solenidiotaxy (Fig. 3) : I 16(1)-6(1)-6-2-1; II 10(1)-5-5-2-0; III 9-4-2-2-1; IV 9-4-2-2-1. On tarsus I, setae \( (te) \) and \( (p) \) are eupathidial and located on a tubercle (Fig. 3A). Famulus \( k' \) distal on genu I, as in Stigmaeidae. Tarsi II to IV with a triplet of dorsal setae, composed of a median thin seta with a small root (eupathidial ?) and two “normal” lateral setae (Fig. 3B). Tarsi I with \( 10 \) setae, \( 1 \) seta on tibia and three terminal eupathidia (Fig. 3F). This species is unique among \( \text{Linotetranus} \) in having a dorsal seta on the palp genu. Supracoxal setae normal (not recessed as \( \text{Namibarbutia} \)).

**Key to Barbutiidae**

1. - Two pairs of eyes, anal aperture ventral, genua II to IV nude, claws with two pairs of short, capitate tenent hairs ............... 2
   - No eyes, anal aperture dorsal, genua II to IV with at least one seta, claws simple .................. \( \text{Namibarbutia seelyae} \) n. sp.
   2. - Seta \( b \) very long, much longer than the other prodorsal setae (230 μm, reaching base of leg IV), tarsus I with 10 setae.
      - Barbutia anguineus Berlese sensu Robaux (1975)
      - Seta \( b \) of same length as seta \( d \), tarsus I with 7 or 8 setae........ Barbutia perretae Robaux, 1975

**Linotetranidae**

*Linotetranus mirabebensis* n. sp.

With a body length of 390 μm, the Namibian species is the smallest of all *Linotetranus* described. The habitus (Fig. 4) of the new species is close to that of *L. cylindricus*, redescribed by Baker & Pritchard (1953): the dorsal striaion pattern is composed of three major areas separated by two furrows; the relief of each area is made up of knobs, delimited by a network of fine, anastomosing, longitudinal lines. The ventral face is composed of four major areas made up of knobs, whose form varies (Fig. 4B). Prodorsum with four pairs of setae, the first pair slightly serrate, the second pair short and not reaching the bases of the third and fourth pairs. Opisthosoma with 18 pairs of setae, some of them very long. Two pairs of aggenital setae; three pairs of genitae, located on two genital plates; three pairs of pseudanal setae, located on the terminal anal lips (Fig. 5A, B). Ovipositor eversible as in Tetranychidae (Fig. 5A, C). Whiplike stylets (Fig. 5D). Palp chaetotaxy: 0-1-0-2-6, with a calcar on tibia and three terminal eupathidia (Fig. 5F), this species is unique among *Linotetranus* in the absence of a dorsal seta on the palp genu. Supracoxal setae normal (not recessed as \( \text{Namibarbutia} \)).

**Key to Linotetranidae**

1. - 17 pairs of dorsal setae on the opisthosoma (seta no. 15 absent) ............... \( \text{Linotetranus achrous} \) Baker & Pritchard, 1953
   - 18 pairs of dorsal setae on the opisthosoma .... 2
   2. - Prodorsal seta 1 distinctly pinnate, prodorsal seta 2 as long as setae 3 and 4, dorsal seta of genu I strongly serrate... *L. protractulus* Athias-Henriot, 1961
Fig. 4: *Linotetranus mirabeensis* n. sp.
A. — Dorsal view; B. — Ventral view. Leg chaetotaxy not drawn.
FIG. 5: *Linotetranus mirabebensis* n. sp.

A. — T.I.p of opisthosoma, with ovipositor everted (lateral view); B. — Idem with the ovipositor inside; C. — Ovipositor everted (ventral view); D. — Gnathosoma in lateral view; E. — Apotele IV in dorsal view, F. — Palp in dorsal view (calcar stippled); G. — Tarsus and tibia IV in dorsal view; H. — Distal part of leg I (antiaxial view).
— Prodorsal seta 1 slightly serrate, prodorsal seta 2 much shorter than setae 3 and 4 (Fig. 5D), dorsal seta of genu I nearly smooth ............... 3

— No dorsal seta on palp genu, seta ag1 short (not reaching the anal lips — Fig. 5B), small species (ca 400 μm) .................. L. mirabebensis n. sp.

— Dorsal seta on palp genu, seta ag1 long (reaching the anal lips), larger species (ca 500 μm) ......... L. cylindricus Berlese sensu Baker & Pritchard, 1953

DISCUSSION

Systematics

The status of the genus Barbutia and that of the family Barbutiidae were discussed in detail by Summers (1964) and Robaux (1975). The presence of tenent hairs on claws in Barbutia is unique among Raphignathoidea and Tetanychidae. Obviously, the new species fills-in part the gap between Barbutia and other Raphignathoidea, especially Stigmaeidae. On the other hand, Namibarbutia also exhibits remarkable characters, such as the duplex (dd-p) on tibia I and the recessed supracoxal setae. I do not propose any change at the familial level. I just note that the introductory remark of Summers (1966) still holds: "The recognition of families and genera of raphignathoids is difficult because no one since Oudemans (1927) has attempted to inventory and systematize this group of mites."

Species identification in Linotetranus meets with some problems. Officially, there are only three species. However, I doubt that the species identified as L. cylindricus by Baker and Pritchard (1953) and collected from Utah is the same as that found by Berlese in Italy. As already suggested by these authors, it is possible that the genus Linotetranus contains a number of species that resemble each other very closely and that the Utah specimens are specifically distinct from the type from Italy. The problem will persist as long as Berlese’s types will be prevented from a serious study and made unavailable to systematists.

Table 1: Chaetotaxic equivalences from different descriptions of Raphignathoidea.

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The ratio length-width

The two new species present a peculiarity already observed in true sand mites such as Nematalycidae: their elongate shape (Coineau et al., 1978). Even
if the two species are not vermiform as *Gordialycus tuzetae*, the ratio length-width (L/W) is high (3.5 and 4.2). Compared to ratios observed in other actinedid mites (table 2), these values are remarkable. Of special interest is the contrast between sabulicolous species running at the surface and others crawling deep into the sand. For instance, *Microcaeculus sabulicolus*, a sabulicolous caeculid, is fundamentally a surface-dweller even if it is able to sink into the sand; the same probably applies to *Neoteneriffiola coineaui* which was found under marble stones in sandy soils. Both species have a L/W ratio closer to that of epigeal forms than that of euedaphic species. Even if an elongate shape is found in many other mites, such as Eriophyoidea for instance, the ecological meaning of such an adaptation in euedaphic sand mites needs more investigation.

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**REFERENCES**


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**TABLE 2: Ratio body length/maximum width (L/W) in different Actinedida (adults only).**

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