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NEW SPECIES OF THE GENUS *BIMICHAELIA* THOR
(ACARI, ENDEOSTIGMATA)
FROM SOUTH DAKOTA

BY

B. McDaniel *

**ABSTRACT**

The two new species described are *Bimichaelia disetosa* and *B. dimixsetosa*.

**Résumé**

Les deux nouvelles espèces décrites sont *Bimichaelia disetosa* et *B. dimixsetosa*.

The genus *Bimichaelia* Thor (1902) was erected for *Michaelia augustana* Berlese, collected in Sweden. EWING (1913) described *Michaelia pallida* from moss in Oregon. THOR and WILLMAN (1941) placed *M. pallida* Ewing in the genus *Bimichaelia* in the United States. BANKS (1915) recorded the genus *Bimichaelia* as having been collected from Oregon, an obvious reference to the work of EWING (1913). BAKER and WHARTON (1952) treated the family Pachygnathidae and referred to the genus *Bimichaelia* as occurring in the southern United States.

Recent ecological soil surveys in South Dakota revealed specimens of two distinct species the descriptions of which are presented here.

**Bimichaelia disetosa** n. sp.

Figs. (1-6)

Dimensions and color: Mean total length of 6 specimens 323 μ (range 322-325 μ); mean width (region between second and third pair of legs), of 6 specimens 250 μ (range 249-251 μ). Color pink. Genital region bearing well-developed genital plates with 3 pairs of branched setae and 3 pairs of genital suckers. Internally there are 3 pairs of setae arising from tubercles. Genitalia umbrella-shaped with umbrella encompassing posterior region of genital plates (Figs. 5-6).

**DORSUM** (Fig. 1): Palp 5-segmented, palptarsus shorter than other palpal segments, with a terminal obtuse solenidion and 2 mucronate spinelike solenidia. Palptarsus only segment pro-

Fig. 1. — Bimichelia disetosa n. sp. — Dorsum showing two types of setae.
jecting when viewed from dorsal region because of hood. Hood rounded, apex sinuous, covered with dorsal striations (Fig. 2). Propodosomal region delineated by the structure of the striations (Fig. 1). Sensory area ornamented with small, round lamellae, 2 pairs of sensillae, anterior pair (ba), filamentous and ciliated from base to apex (Fig. 3), posterior pair (bb) cup-like on a short stalk (Fig. 3). Naso rounded, thum-like, projecting from anterior portion of sensory area (Fig. 2). Remaining sensory area setae are plumose and similar to body setae, a pair placed on each side of naso (bf), a pair below and between cup-shaped sensillae (bm), and 2 pairs of lateral margins of sensory region (be, br).

Dorsum with star-like reticulations connected by lines (Fig. 1) radiating from several points or origin along both sides of dorsum. Dorsal setae of 2 distinct types, thus the name disetosa. Setae of posterior 2 segments larger than other setae with a more elongated structural development. Remaining dorsal setae on other segments asymmetrically arranged, short and plumose.

Venter (Fig. 4): Surface with same type of reticulation as dorsum. Genital opening provided with 3 pairs of internal setae associated with umbrella-like covering (Fig. 5). Six pairs of genital setae, 4 pairs of anal setae, all plumose, remainder of venter as shown in Fig. 4.

Gnathosoma: Hypognathus bears 2 pairs of branched setae (a, b) with setae (c) on palpcoxa. Ecotomalae prominent, needle-like, without denticles. Hypognathus with same type of reticulation as sensory area of dorsum. Palptarsus bears plumose setae and 1 terminal solenidion, associated with 2 spine-like solenidia. The chelicerae are needle-like, enlarged at base, movable with fixed digits without denticles.

Fig. 4. — *Bimichaelia disetosa* n. sp. — Venter showing setae and reticulation.
Legs: Tarsus I bears 2 obtuse solenidia, anterior solenidion larger than posterior solenidion, tibia I with 1 obtuse solenidion similar in size and shape as posterior solenidion of tarsus I. Tarsus II bears 2 short, obtuse solenidia; tibia II with 1 small obtuse solenidion. Tibia III and IV each with a single solenidion, tibia IV solenidion smaller than all other leg solenidia. The ambulacrum consists of the small apotele, 2 claws and rayed empodium. All leg segments with reticulation similar to that associated with dorsal sensory area and hypognathum.

Main diagnostic features: Two types of setae on dorsum, setae of posterior 2 segments larger, more elongate than other dorsal setae; structure of genitalia with umbrella-like covering; structure of sensillae (ba); type of body reticulation.

*Bimichaelia disetosa* resembles *B. dimixsetosa* n. sp. from South Dakota, but differs in the structure of sensillae (ba), dorsal reticulation pattern; 2 different types of dorsal enlarged setae restricted to posterior dorsal segments and structure of genitalia.

Types: Holotype and 4 paratypes collected from Deuel County, Altamont Prairie native grassland, 3 miles east of the junction of Highways 77 and 212 on State Road, from ungrazed native prairie, July 8, 1976 by B. McDaniel. Additional material collected includes 1 specimen from Yankton County, 3 miles south of Valley View from a grazed pasture overgrown with thistle plants, July 7, 1976, by B. McDaniel.

*Bimichaelia dimixsetosa* n. sp.  
(Figs. 7-12)

Dimensions and color: Mean total length of 10 specimens 331 μ (range 330-333 μ); mean maximum width (region between second and third pair of legs) of 10 specimens 251 μ (range 250-252 μ). Color pink. Genital region with well-developed plates containing 7 branched setae, 3 pairs of bottle-shaped genital suckers, with genitalia bearing 2 pairs of large internal genital setae (Fig. 12).

Dorsum (Fig. 7): Hood rounded, apex sinuous, covering mouthparts when retracted. Naso well-developed at anterior portion of sensory area. Sensory area ornamented with lattice work containing sensory sensillae (ba), the naso and small, plumose setae (bm) placed between sensory cup-shaped sensillae (bb) and below sensillae (ba), all surrounded by dorsal body setae forming a triangular region (Fig. 8). The cup-shaped sensory sensillae (bb) are outside the ornamental lattice network; sensillae (ba) with apex ending in 4 large branches (Fig. 9). Club-shaped sensillae (bb) more elongate than sensillae (bb) of *B. disetosa* (Fig. 9).

Dorsum with ornamentation in the form of numerous polygons formed by small dash-like marks similar to that found on *B. arbusculosa* Grandjean, *B. diadema* Grandjean, and *B. reticulata* Shiba, but unlike the star-like structures on *B. disetosa* (Fig. 7). Dorsal setae of 2 distinct types but unlike *B. disetosa* the small numerous dorsal plumose setae extend to and are on the last 2 dorsal segments, whereas the larger more elongated setae are interspersed, even appearing above the last 2 segments of the dorsum, thus the name dimixsetosa indicating that both setae are mixed over the dorsum (Fig. 7).

Venter (Fig. 10): Surface with similar reticulation as found on dorsum; small plumose setae similar to dorsal setae. Genital opening shows 2 enlarged internal genital setae (Fig. 12). Genitalia as in Fig. 11. Seven pairs of genital plate setae similar in structure to other ventral setae; 4 pairs of anal setae. All setae of one type, short plumose as on dorsum.
Fig. 6. — *Bimichaelia disetosa* n. sp.
Genitalia showing umbrella encompassing posterior region of genital plates.
Fig. 7. — *Bimichaelia dimixsetosa* n. sp. — Dorsum showing two types of setae.
Fig. 8, 9, 11, 12. — *Bimichaelia dimixsetosa* n. sp.

8) Dorsum showing ornamental lattice work of sensory area; 9) *Bimichaelia dimixsetosa* n. sp. — Dorsum showing sensilla ba; 11) Venter showing genital region; 12) Enlargement of genitalia showing enlarged genital setae.

*Gnathosoma*: Hypognathus bears 3 pairs of setae (ab), setae (c) on palpcoxal. Ectomala prominent, each needle-like. Chelicerae swollen at base, very long, needle-like, being much longer than chelicerae of *B. disetosa*, movable and fixed digits without denticles. Palptarsus bears 6 plumose setae, a terminal obtuse solenidion associated with 2 mucronate spine-like solenidia.
Legs: Tarsus I bears 2 obtuse, curved, solenidia, anterior one curved at apex, posterior one enlarged at base with curvature about midlength of solenidion. Tibia I with a single large, curved solenidion, larger than either solenidia of tarsus I and a small, obtuse solenidion. Tarsus II bears 2 short obtuse solenidia; tibia II with 2 solenidia similar in structure to those of tibia I. Tibia III with 2 solenidia similar in shape as solenidia of tibia II, smaller and much more spine-like in structure. Tibia IV a single small solenidion similar to small solenidia on legs of tibia III. The ambulacrum consists of the small apotele, 2 claws and rayed empodium.

Fig. 10. — *Bimichaelia dimixsetosa* n. sp. — Venter showing setae and reticulation.
Two nymphal stages were collected of this species: a deutonymph and tritonymph. Except for the reduction of the number of genital suckers in the deutonymph the smaller solenidia on legs I and II and the absence of the genitalia of the tritonymph both show the characters of the adult.

Main diagnostic feature: Dorsal setae of 2 different structural types mixed indiscriminately over dorsum; structure of sensillae (ba); curved solenidia of tarsus and tibia I; structure of genitalia.

*Bimichaelia dimixsetosa* resembles *B. setosa* by having 2 types of setae on the dorsum, but differs in that the 2 types are mixed indiscriminately over dorsum. In *B. setosa* each type is restricted to a region of the dorsum. *B. dimixsetosa* has the same type of dorsal and ventral reticulation as *B. diadema, B. reticulata*, and *B. arbusculosa* but differs from these species by the structure of the genitalia, type of sensillae (ba) and dorsal setae.

Types: Holotype and 3 paratypes Davison County, 1.5 miles north of Lake Mitchell, South Dakota, off Highway 37, May 19, 1977 from a shelter belt, collected by B. McDaniel. Additional specimens include a deutonymph and tritonymph with same data as holotype.

REFERENCES


*Paru en Mai* 1980.