

A NEW SUBGENUS AND TWO NEW SPECIES
OF HEXIDIONIS (ACARINA, TROMBICULIDAE)
FROM NORTH AMERICA¹

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ABSTRACT: A new subgenus, *Zosteridionis*, is proposed for five species, including the type species *Hexidionis deserti*, n. sp., type locality, 3 mi. SE Needles, San Bernardino Co., California, off *Dipodomys m. merriami*. The subgenus *Hexidionis* consists of five species including, *Hexidionis macropus*, n. sp., from La Burrera, Baja California Sur, Mexico, off *Peromyscus eremicus*.

INTRODUCTION

Further studies of chiggers from western North America have uncovered two additional species of the genus *Hexidionis* Vercammen-Grandjean and Loomis.

In addition, the genus *Hexidionis* is divided into two subgenera each with five species. The division is based upon larval characteristics.

Grateful acknowledgment for helping to assemble these and other chiggers is extended to many individuals including: R. M. Davis, L. K. Tanigoshi, L. C. Spath, W. L. Hunter, D. E. Harvey, K. D. Peyton, J. P. Webb, Jr., W. J. Wrenn and Dr. E. L. Sleeper. We also wish to thank Elaine Katzer for her excellent drawings.

Zosteridionis, new subgenus

Type species. — *Hexidionis deserti* Loomis and Lucas, new species.

Included species. — *Trombicula polytechnica* Hoffmann, 1963; *T. breviseta* Loomis and Crossley, 1963; *T. doremi* Brennan and Beck, 1956; *Hexidionis harveyi* Loomis and Lucas, 1969.

Diagnosis. — Larva. Characteristics of genus *Hexidionis*, but differing from the subgenus *Hexidionis* in having ratio of distance between dorsal genualae to length of genu I less than 0.3 (greater than 0.3 in subgenus *Hexidionis*); more than 80 dorsal body setae (less than 80 dorsal body setae); with 3 genualae I (2 or 3 genualae I); and dorsal proximal seta of palpal tarsus expanded at base with bifurcation of distal half (seta with narrow base and without bifurcation).

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Remarks. — The major larval characters used to separate the two subgenera are: 1) the distance between dorsal genualae as a ratio to length of genu I; 2) the number of dorsal body setae; 3) the number of setae on genu I; and 4) the size and shape of the dorsal proximal seta on the palpal tarsus.

Initially Vercammen-Grandjean and Loomis (1967) proposed two subgenera in *Hexidionis*, *Hexidionis* from North America and *Pentidionis* from northern Africa and Asia Minor. Lucas and Loomis (1969) elevated *Pentidionis* to generic status based upon differences in larval characteristics.

The five species of the subgenus *Zosteridionis* are known from southern Nevada and southwestern Utah southward to central Mexico, and there are a few known cases of sympatry. However, there are numerous records of members of both subgenera occurring at the same locality throughout southwestern United States.

Zosteridionis is a compound Greek word, *zoster* — band or girdle and *idion* — a diminutive suffix. Literally translated, *Zosteridionis* means "little girdle" and refers to the small bands, or girdles, seen in the legs of larvae belonging to the genus.

***Hexidionis (Zosteridionis) deserti*, new species**

Figure 1

Types. — Holotype and 17 paratopotypes from 3 miles southeast of Needles, 600 ft., San Bernardino Co., California; original numbers WJW611014-18 (holotype and 5 paratopotypes), WJW611014-15 (5), WJW611014-14 (7); host *Dipodomys merriami merriami* (Merriam's kangaroo rat); taken 14 October 1961 by W. J. Wrenn and N. G. Puckett.

Diagnosis. — Larva. Resembling *Hexidionis doremi* in having similar scutal shape, gnathosomal setation and specialized setae on legs; but differing from it in having longer dorsal body setae (25μ) only slightly expanded; total leg measurement greater than 1,000; and humeral setae well-defined and longer than dorsal body setae.

Description. — Based on holotype with differences noted among paratopotypes. All measurements are in microns.

Body: Nearly round; color in life orange; eyes 2/2, ocular plate indistinct.

Gnathosoma: Cheliceral base punctate; blade slender with tricuspid cap. Palpal setae B/B/NNB, palpal tarsal setae 7BS, palpal tibial claw trifurcate. Galeala with numerous branches.

Scutum: About 1.5 width/length with posterior three-fourths punc-

tate. Lateral margins sinuous, anterior margin perpendicular to lateral margins, posterior margin concave. Sensilla filiform with barbs on proximal three-fourths and distal one-fourth having 8-10 branches.

Scutal measurements of holotype and (in parentheses) mean and extremes of 10 types. AW 77 (77, 72-82), PW 85 (86, 83-91), SB 30 (31, 28-34), ASB 28 (30, 27-33), PSB 21 (22, 20-25), AP 17 (17, 16-19), AM 41 (39-42, 8), AL 42 (38, 33-42, 9), PL 44 (44, 37-48), S 78 (80, 75-90, 9).

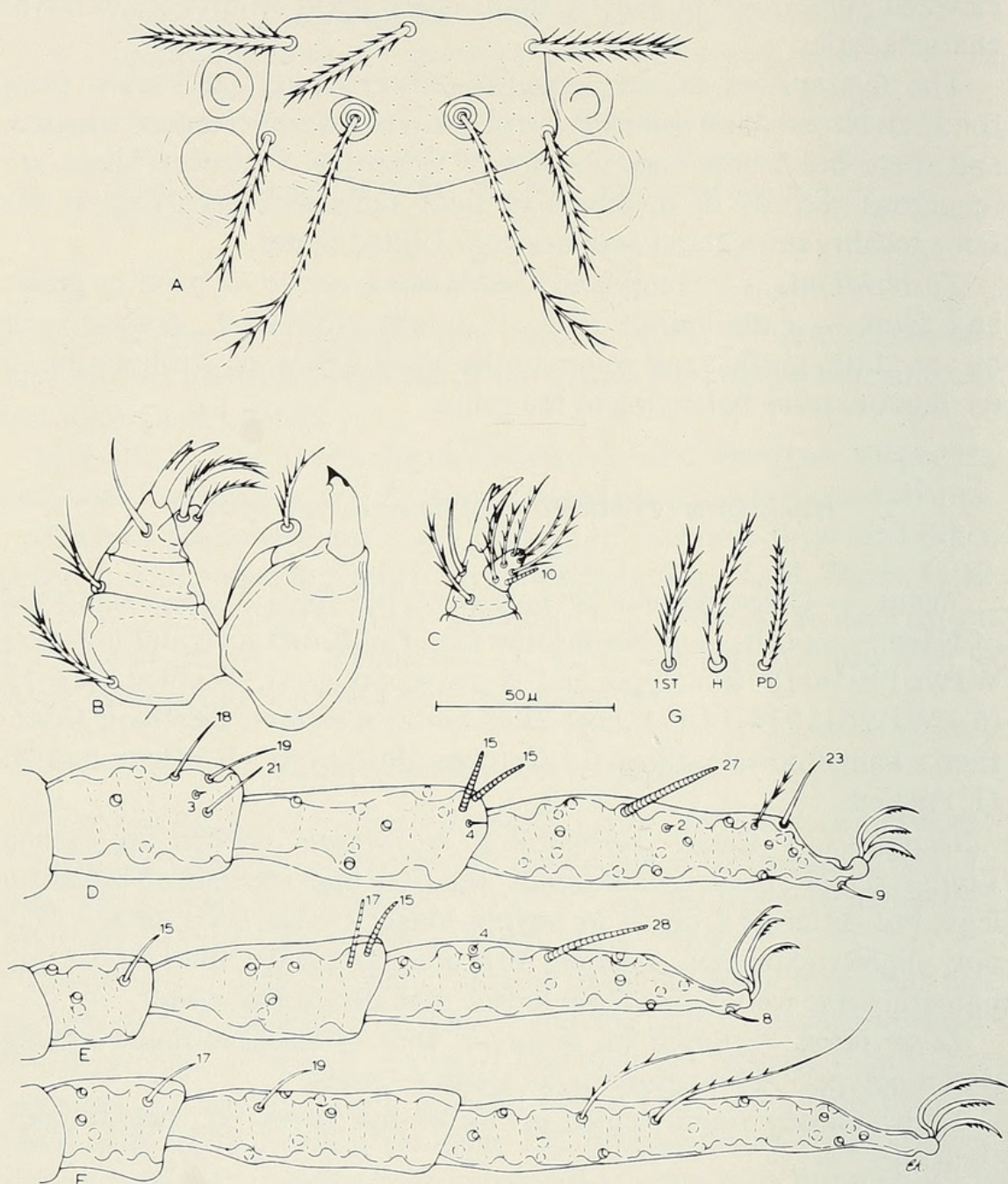


Figure 1. *Hexidionis (Zosteridionis) deserti*, n. sp. A. Scutum and eyes. B. Dorsal aspect of gnathosoma. C. Ventral view of palpal tibia and tarsus. D. Leg I—genu, tibia and tarsus with nude setae, bases of branched setae and with measurements in microns. E. Leg II. F. Leg III. G. Representative body setae: 1st, first sternal; H., humeral; PD, posterior dorsal.

Body setae: All body setae with many branches. Dorsal setal formula for holotype 2 (humeral) -10-10-10 plus approximately 80; measurement of humeral seta 39, posthumeral seta 25, posterior dorsal seta 36. Ventral setae 2-2 plus approximately 55 preanal setae, measurement of first sternal seta 37, small posterior seta 27. Total body setae approximately 171.

Legs: All coxae lightly punctate. Leg I with 3 genualae, subequal, (18-19-21), microgenuala; 2 tibialae (15-15), microtibiala; tarsala (27), microtarsala, subterminala (23), pretarsala (9). Leg II with genuala (15); 2 tibialae, subequal, (15-17); tarsala (28), microtarsala, pretarsala (9). Leg III with genuala (17); tibiala (19). All legs with internal bands in genu (2-3), tibia (2-3) and tarsus (5-8). Each leg having 2 claws with 2-5 onychotriches and a clawlike empodium with 2-3 onychotriches.

Leg lengths of holotype and (in parentheses) mean and extremes of 10 types: leg I 379 (396, 375-426), leg II 330 (346, 309-390), leg III 372 (390, 360-442), total leg lengths 1081 (1132, 1048-1248).

Remarks. — In *Hexidionis deserti* the two humeral setae are distinctly longer than the dorsal setae of the first posthumeral row; whereas, in *H. doremi* all of these setae are approximately equal.

Ecological notes. — *Hexidionis deserti* is found throughout the Mojave and Sonoran Deserts. Most of the larvae were from *Dipodomys m. merriami* and *D. deserti*. The principal parasitope is the face, especially around the external nares and the margins of the cheek pouches.

The larvae of *H. (Z.) deserti* were found on hosts in the cooler months between September and June.

The type locality had a few Ocotillo (*Fouquieria splendens*) and Creosote bushes (*Larrea divaricata*), along sandy dry washes with steep clay banks containing mammal burrows.

Specimens examined (520).

Hexidionis (Zosteridionis) deserti (513), all hosts *Dipodomys merriami*, unless otherwise noted. USA. ARIZONA-Pima Co.: 1 mi. N Montezuma's Head, Organ Pipe Cactus Natl. Mon., 9 Nov. 1962 (18). CALIFORNIA-San Bernardino Co.: 3 mi. SE Needles, 14 Oct. 1961 (38, including types); 8 mi. S Barstow, 4 Nov. 1962 (7), 5 Nov. 1962 (9), 21 Nov. 1962 (4), 26 Jan. 1963 (4), 2 Sept. 1963 (25), 24 Jan. 1964 (4), 22 Feb. 1964 (3); 0.7 mi. N Morongo Valley, 20 July 1962 (9), 19 May 1962, *Perognathus longimembris* (1); Giant Rock, 23 Sept. 1961 (7); Indian Cove, in Joshua Tree Natl. Mon., 22 Jan. 1961 (1). Kern Co.: 17 mi. W Rosamond, 23 Sept. 1964 (16). Riverside Co.: 9.1 mi. NE Desert Center, 3 May 1964 (4), (the following all from Joshua Tree Natl. Mon.), Pinto Wash Well, 6 Aug. 1965 (16), 13 Nov.

1966 (1); 4.5 mi. S Cottonwood Spring, 12 March 1966 (8); 4.2 mi. NE Old Dale Jct., 20 May 1961, *Perognathus formosus* (4), 2 Dec. 1963 (69); 7 mi. N Cottonwood Spring, 23 Jan. 1961 (42); Pleasant Valley, 26 Nov. 1962 (46); Long Canyon, 16 March 1963 (10), 20 April 1963 (2), *Perognathus fallax* (2). Imperial Co.: 10.5 mi. S, 2.5 mi. W Plaster City, 30 Jan. 1965 (47); 12 mi. S Palo Verde, 2 Nov. 1964 (1). San Diego Co.: Anza Borrego Desert State Park, 16 Nov. 1958 (1); 0.1 mi. SW Ranger Station, 13 June 1961, *Perognathus fallax* (3). NEVADA-Nye Co.: 15 mi. N Death Valley Jct. (T & T Ranch), 19 Oct. 1963 (7). MEXICO. SONORA: 55 mi. SE San Luis, 30 Nov. 1964 (11); 10 mi. N Puerto Peñasco, 30 June 1965, *Dipodomys deserti* (11); 4 mi. SE San Luis, 29 June 1965, *D. deserti* (3). BAJA CALIFORNIA NORTE: 30 mi. S San Felipe, 21 Dec. 1960 (79).

Hexidionis (Zosteridionis) doremi (7). UTAH-Washington Co.: Rockville, 6 Sept. 1951, *Dipodomys merriami* (1 paratype). CALIFORNIA-Inyo Co.: Grandview Camp, White Mountains, 14 Aug. 1964, *Perognathus parvus* (6)

Subgenus *Hexidionis* Vercammen-Grandjean and Loomis

Hexidionis (Hexidionis) Vercammen-Grandjean and Loomis, 1967: 139-140.

Type species. — *Trombicula jessiema* Gould, 1956.

Included species. — *Trombicula allredi* Brennan and Beck, 1956; *T. lacerticola* Loomis, 1964; *Hexidionis navojoe* Lucas and Loomis, 1968; *H. macropus*, n. sp.

Diagnosis. — Larva. Ratio of distance between dorsal genualae to length of genu I greater than 0.3; less than 80 dorsal body setae; with 2 or 3 genualae I.

***Hexidionis (Hexidionis) macropus*, new species**

Figure 2

Types. — Holotype and 13 paratopotypes from La Burrera, Baja California Sur, Mexico; host *Peromyscus eremicus eva* Thomas (Cactus Mouse); original numbers RMD670706-23 (holotype and 3 paratopotypes), RMD670706-22 (2), RMD670706-20 (6), and RMD670706-19 (2); taken on 6 July 1967 by R. M. Davis, E. M. Fisher and L. W. Robbins.

Diagnosis. — Larva. Similar to *Hexidionis jessiema* (Gould), 1956,

but differing from *H. jessiemae* in having shorter PL setae (less than 50) off scutal plate.

Description. — Based on holotype with differences noted among 14 paratopotypes. All measurements are in microns.

Body: Nearly round; color in life orange; eyes 2/2, ocular plate indistinct.

Gnathosoma: Cheliceral base punctate, blade slender with tricuspid cap. Palpal setae B/B/BBB, palpal tarsal setae 7BS, palpal tibial claw trifurcate. Galeala with numerous branches.

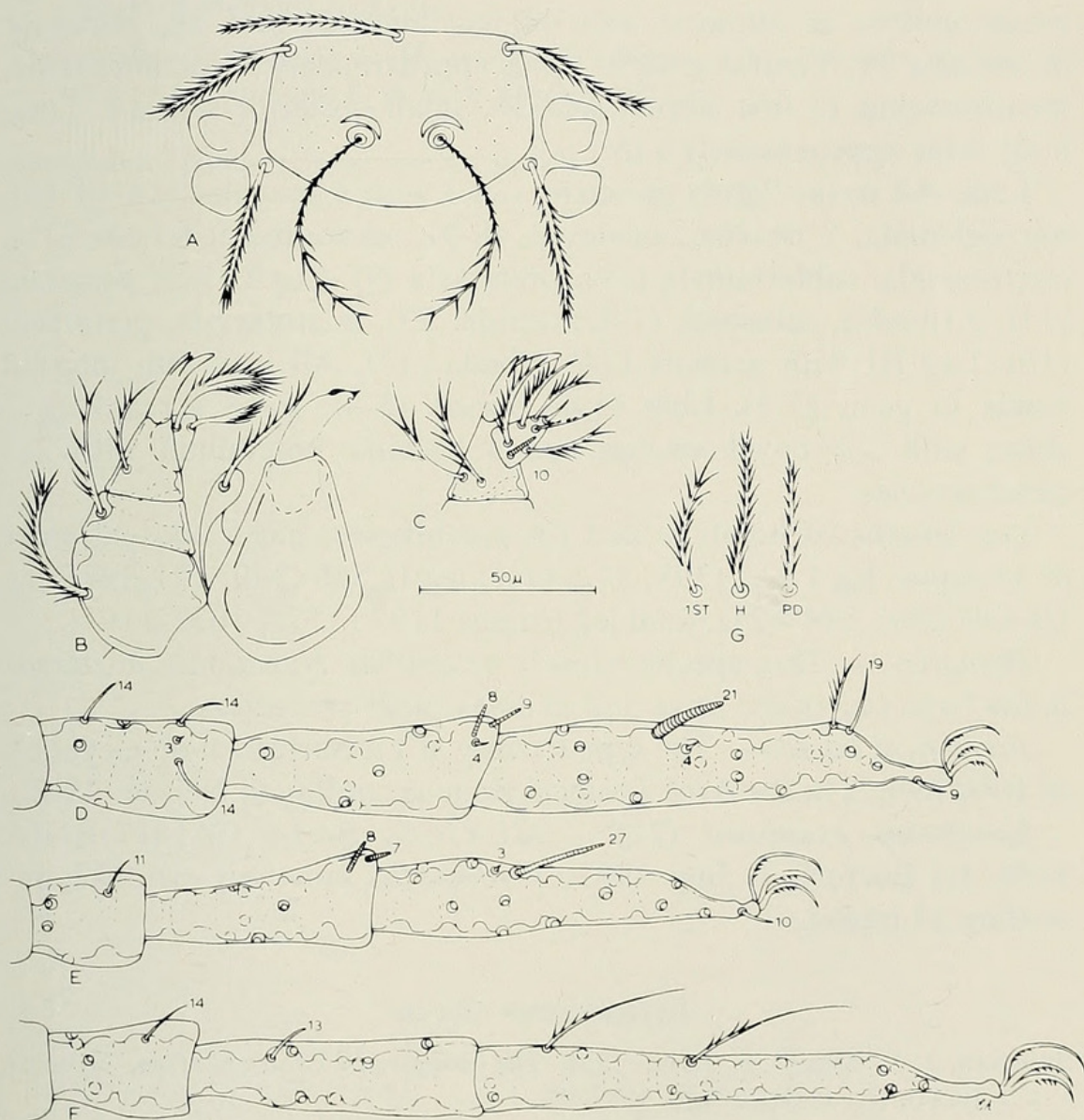


Figure 2. *Hexidionis* (*Hexidionis*) *macropus*, n. sp. A. Scutum and eyes. B. Dorsal aspect of gnathosoma. C. Ventral view of palpal tibia and tarsus. D. Leg I—genu, tibia and tarsus with nude setae, bases of branched setae and measurements in microns. E. Leg II. F. Leg III. G. Representative body setae: 1st, first sternal; H, humeral; PD, posterior dorsal.

Scutum: About 1.5 width/length with posterior two-thirds punctate. Lateral margins sinuous; anterior margin perpendicular to lateral margin; posterior margin concave. Sensilla filiform with barbs on proximal half and distal half having 10-12 branches.

Scutal measurements of holotype, and (in parentheses) mean and extremes of 14 types. AW 60 (60, 58-63), PW 72 (77, 72-93), SB 19 (20, 19-22), ASB 31 (31, 27-34), PSB 20 (21, 19-23), AP 31 (31, 26-37), AM 49 (49, 46-53), AL 39 (37, 34-45), PL 41 (43, 38-47), S 60 (61, 58-66, 5).

Body setae: All body setae with many branches. Dorsal setal formula for holotype, 4 (humeral)-6-4-6-6-6-6 plus approximately 43; measurements of humeral seta 43, posthumeral seta 36, posterior dorsal seta 39. Ventral setae 2-2 plus approximately 25 preanal setae, measurements of first sternal seta 36, small posterior seta 24. Total body setae approximately 116.

Legs: All coxae lightly punctate. Leg I with 3 genualae (14-14-14), microgenuala; 2 tibialae, subequal, (8-9), microtibiala; tarsala (21), microtarsala, subterminala (19), pretarsala (9). Leg II with genuala (11); 2 tibialae, subequal, (7-8); tarsala (27), microtarsala, pretarsala (10). Leg III with genuala (14); tibiala (13). All legs with internal bands in genu (2-3), tibia (3-4), tarsus (5-8). Each leg having 2 claws with 3-5 onychotriches and a clawlike empodium with 2-3 onychotriches.

Leg lengths of holotype and (in parentheses) mean and extremes of 14 types: leg I 411 (398, 372-411); leg II 366 (349, 321-397); leg III 420 (398, 384-421), total leg lengths 1197 (1132, 1032-1197).

Remarks. — This species closely resembles *Hexidionis jessiema* in the large size of the larva and in many other characters.

Ecological notes. — The type locality at La Burrera at an elevation of 1600 feet, is in the Arid Tropical Zone according to Nelson (1922).

Specimens examined (22). — MEXICO, BAJA CALIFORNIA SUR, La Burrera, 6 July 1967, *Peromyscus eremicus eva*, (22, including 14 types).

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