TWO NEW *PODOCINUM* FROM THE UNITED STATES WITH DISTRIBUTION NOTES ON THREE DESCRIBED SPECIES (ACARINA: PODOCINIDAE)[1]

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Mites of the genus *Podocinum* inhabit litter and rodent's nests and are probably predacious. Most of them occur in the tropics, only one species (*P. pacificum* Berlese, represented by a single female from Berkeley, Calif.) having been recorded from the United States. Evans and Hyatt (1957) in their paper on this group point out that with the exception of *P. pacificum* and *P. sagax* (Berl.) they know of no species which occurs outside the latitudes 30° N. and 30° S. and that the records for *P. sagax* outside this area suggest that the species was introduced with ornamental plants into botanical gardens. One of the new species described in this paper occurs near Erwin, Tennessee at a latitude slightly north of 36° N. at an elevation of about 2700 feet; the other occurs in Florida at a latitude of about 26½° N.

Podocinum pacificum is fairly common in the mountains near Erwin, and I have watched them many times in the hope of seeing them feed, but without success. The mites move in a deliberate manner holding the first pair of legs back over the body in a position roughly resembling a question mark and only occasionally putting one or the other leg forward using it in the manner of an antenna. *P. catenulum*, n. sp., carries its front legs in the same way as does *pacificum*, and they at times occur together for I have taken both species from the same handful of litter.

All measurements given in the descriptions are in microns.

Podocinum catenulum, new species

(Fig. 1-7)

Podocinum catenulum traces to couplet 6 in the key to species by Evans and Hyatt (*op. cit.*); it differs most noticeably from *orientale* Evans and Hyatt in having six pairs of stout setae on the posterior half of the dorsal shield and from *sumatrense* Evans and Hyatt in having a total of 19 pairs of setae on the dorsal shield. The male is unknown.

FEMALE: Dorsal shield 390-452 long, 299-362 wide, dark brown, heavily sclerotized and curving under all round so as to partly cover the ventral surface; posteriorly in some specimens the dorsal shield covers the ventral surface almost to the ventrianal shield as shown in Fig. 1; dorsal shield covered with a polygonal network of rows of minute, rounded projections, most of the surfaces within the network with one to seven much smaller projections. In addition, the dorsum bears a design composed of small, cicatrix-like areas with scalloped margins—areas probably homologous with the bald areas of *P. sagbax*, *P. jamaicense* E. and H., and *P. pugnorum*, n. sp. The distribution of setae, cicatrix-like areas, and pores is

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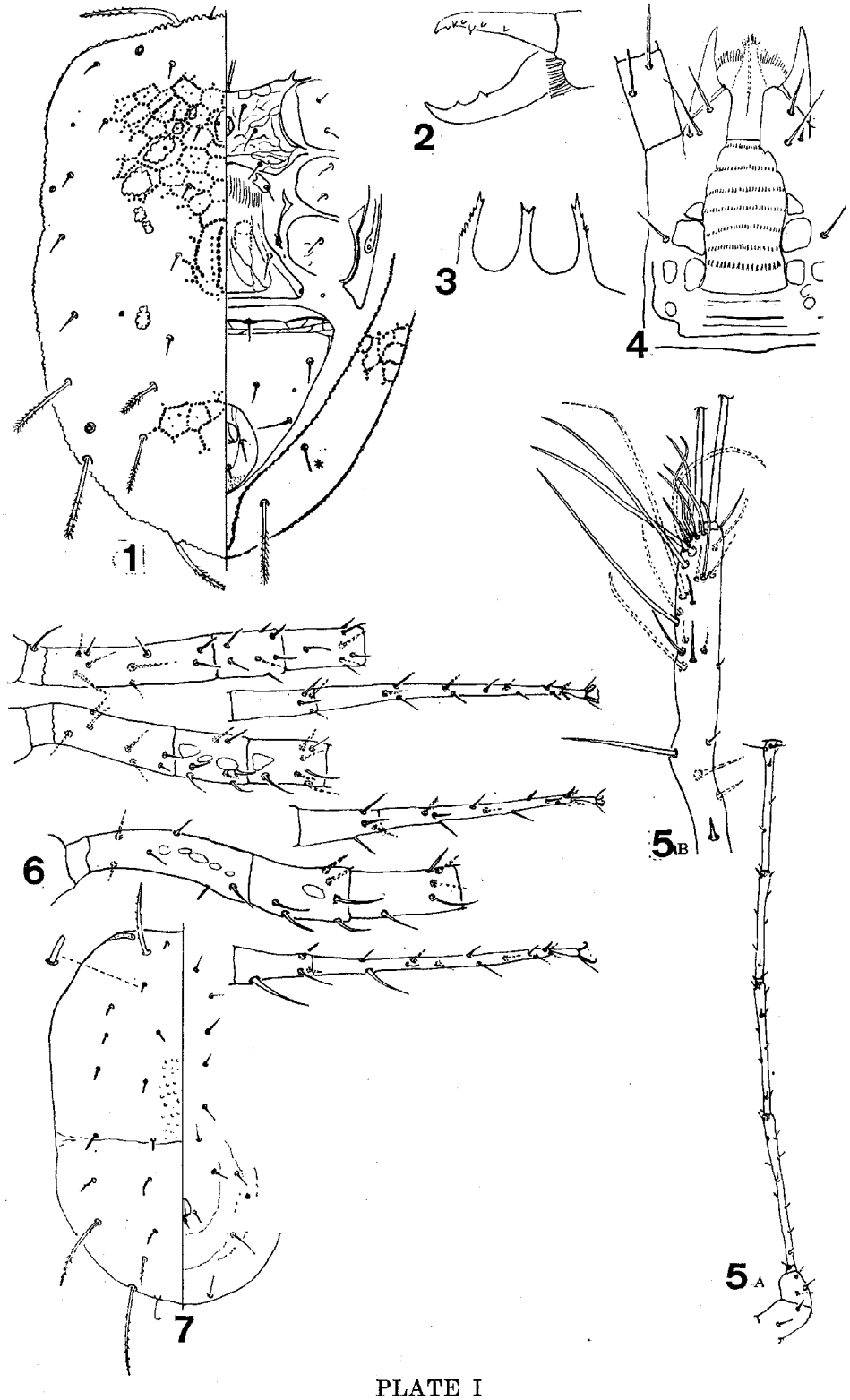

PLATE I

Fig. 1-6. *Podocinum catenulum*, n. sp., female. 1, dorsum and venter; 2, chelicerae; 3, tectum; 4, rostrum; 5A, leg I to subterminal setae; 5B, leg I distal of subterminal setae; 6, legs II-IV (from top to bottom).
Fig. 7. *Podocinum catenulum?*, deutonymph, dorsum and venter.

shown in Fig. 1. Vertical setae 9 long, 16 apart; paraverticals 88 long; the three posterior marginal setae from front to rear are 53, 55, and 52-65 long. Ventrianal shield 145-163 long, 168-185 wide with four pairs of preanal setae and a pair of pores; posterolateral interscutal membrane without interscutal seta, this seta (indicated by an asterisk in Fig. 1) apparently having migrated to the dorsal shield. Peritremes anteriorly follow margin of dorsal shield and so remain on ventral surface; they appear to join at mid-line. The chelicerae are shown in Fig. 2 and the tectum in Fig. 3; rostrum (Fig. 4) with seta Cl 23, C2 5, and C3 27 long. Leg I (Fig. 5A and 5B) 950-1019; tarsus I 231-253, subterminal setae 32 and 14; tibia I 186, genu I 200 long. Leg. II 515-543, leg III 447-485, leg IV 567-588 long (excluding pretarsi); pretarsi 22 long; tarsus IV (excluding pretarsus) 213-220 long; proximal macroseta of metatarsus IV 45, distal macroseta 27 long; macroseta of tarsus IV proper 36 long; the chaetotaxy of legs II-IV is shown in Fig. 6.

NYMPH: A deutonymph (Fig. 7) collected with four females, one of them teneral, almost certainly belongs here as leg I is similar to leg I of the female *catenulum*. Dorsum without network of small rounded projections, but with a cluster of small, rounded projections in mid-dorsal area; the dorsum appears to be divided, but no margins can be distinguished at the sides. All setae of the dorsal shield that are not serrate are blunt and resemble the finger of a rubber glove in shape and are 7-14 long. Paraverticals 74 long; the two long posterior setae 72 and 80 long. All ventral setae slender and sharply pointed.

Holotype: Female, Erwin, Tennessee, 27 August 1962 (D. De Leon), on decaying apples on ground; *paratypes*: 3 females collected with holotype; 1 female from moss by creek, Aug. 1961, and 1 female, 10 January 1963, Erwin, Tenn., from dead oak leaves. Type and paratypes are in the author's collection.

Podocinum pugnorum, new species
(Fig. 8-12)

Podocinum pugnorum resembles *P. sagax* (Berlese) differing chiefly in having only 16 pairs of setae on the dorsal shield and of these there are only four pairs of large, stout setae posteriorly. The male is unknown.

FEMALE: Dorsal shield 468 long, 308 wide, and densely covered with minute, sharp projections except for bald areas as indicated in Fig. 8; paravertical setae 72 long; posteriorly, anterior lateral seta 86, posterior lateral 96, anterior mediolateral 78, and posterior mediolateral 76 long. Ventrianal shield 137 long 240 wide with four pairs of preanals and a pair of pores; tectum normal (Fig. 9). Spermatheca (Fig. 10) 14 long, situated close to coxae III and IV. Leg I (Fig. 11) 1350, tarsus I 386, tibia I 219, genu I 291 long; leg II 745, leg III 600, leg IV 798 long (excluding pretarsi); pretarsi 25-35 long; tarsus IV (excluding pretarsus) 304, pretarsus 32 long; anterior macroseta of metatarsus 79 long. The chaetotaxy of tarsus IV is shown in Fig. 12.

Holotype: Female, Parrish, Florida, October 19, 1960 (M. H. Muma), from litter under citrus tree. Specimen in the collection of the Citrus Experiment Station, Lake Alfred, Florida.

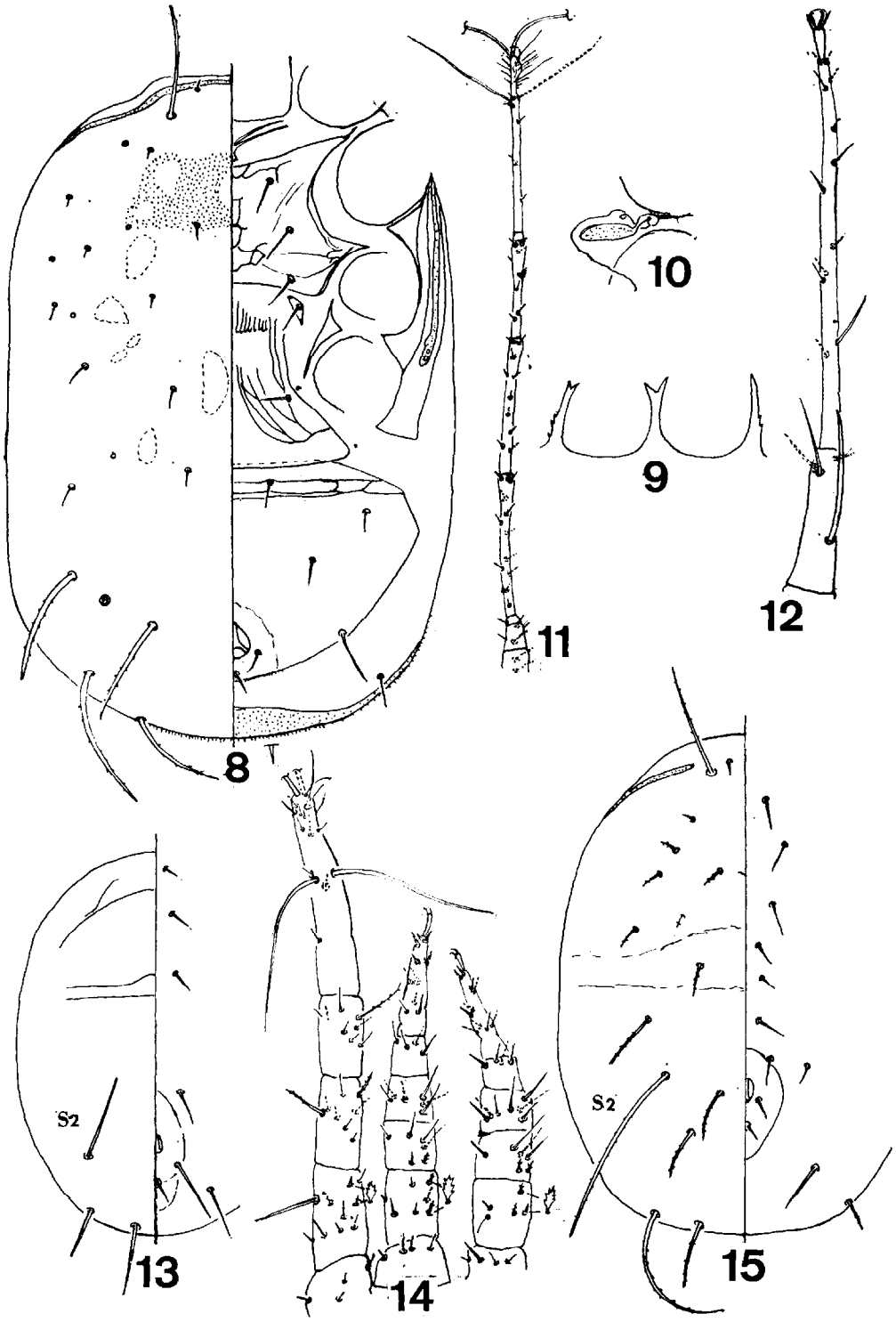

PLATE II

Fig. 8-12. *Podocinum pugnorum*, n. sp., female. 8, dorsum and venter; 9, tectum; 10, spermatheca between coxae III and IV; 11, leg I; 12 tarsus IV.

Fig. 13-15. *Podocinum pacificum* Berlese? 13, dorsum and venter of larva; 14, legs I-III (from left to right) of larva; 15, dorsum and venter of deutonymph.

Podocinum pacificum Berlese
(Fig. 13-15)

Evans and Hyatt (*op. cit.*) figured the two nymphal stages and Berlese (1882) the larval stage of *P. sagax* (Berlese). The immature stages of no other previously described species appear to be known. Although not reared, I am fairly sure that a larva and deutonymph collected in 1962 near Erwin, Tennessee, are immature stages of *P. pacificum* Berlese.

LARVA: Body (Fig. 13) 210 long, nearly round, with only 3 pairs of setae on the dorsum; seta S2 56 long. Rostrum with setae C1 and C2 14 long. Leg I with subterminal setae long and whip like; leg I not much longer than legs II and III (Fig. 14); tarsus I 143, tibia I 54 long; macroseta of tibia I 43 long.

DEUTONYMPH: Body without a distinct dorsal shield (Fig. 15); dorsum with 15 pairs of setae, paraverticals 81, S2 150 long. Rostrum with seta C2 5 long, setae C1 and C3 about 20 long. Leg I similar to leg I of female *pacificum*, especially in proportional sizes of subterminal setae.

NEW DISTRIBUTION RECORDS FOR SOME DESCRIBED SPECIES

Unless otherwise noted all records are for specimens in the U. S. National Museum Collection and are based on single females.

Podocinum pacificum Berlese: Tryon, North Carolina, July 1937 (D. C. Peattie), on wild ginger flower; Urbana, Illinois, 10 January 1939 (P. C. Stone), 2 females in nest of *Microtus ochrogaster;* Mt. Vernon, Virginia, 10 December 1944 (Andre), in moss; Charlottesville, Virginia, 15 February 1948 (R. L. Hoffman), in leaf mold; Lawrence, Kansas, 3 July 1946 (P. W. Jameson, Jr.), from nest of *Microtus ochrogaster*; Moss Bluff, Florida, 22 May 1958 (H. L. Greene and M. H. Muma), four females from pine leaf and hardwood litter, in Citrus Experiment Station Collection, Lake Alfred; Erwin, Tenn., 1961-1963, 11 females in author's collection from litter and decaying apples on ground (many more specimens were seen than collected); Cuesta de Acultzingo, Veracruz, Mexico, 16 January 1942 (F. Bonet), 2 females from dead leaves.

Podocinum jamaicense Evans and Hyatt: Tamazunchale, S.L.P., Mexico, on orchid plant at Brownsville, Texas, 28 August 1947; El Hule, Oaxaca, Mex., 13 January 1940 (F. Bonet), 3 females; Vero Beach, Florida, 17 June 1958 (H. L. Greene and M. H. Muma) on oak, in Citrus Experiment Station Collection; Peru, in soil on bromeliad at Miami, Florida, 9 February 1961 (C. E. Stegmaier).

Podocinum sagax (Berl.): Guatemala, on debris with *Odontoglossum grande* at San Francisco, Calif., 31 July 1936 (R. Clemens); Guatemala, on orchid plants at Brownsville, Texas, 9 and 17 Sept. 1946; Orizaba, Mex., 14 Jan. 1942 (F. Bonet), from dead leaves; Quebradillas, Puerto Rico, 4 July 1951 (J. M. Capilles), one male on guajatzca; China, at San Francisco, Calif., 22 Dec., 1937, 1 male on *Zingiber officinale.*

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LITERATURE CITED

Berlese, A. 1882. Acari, Myriopoda, et Scorpiones hucusque in Italia reperta. Padoue. Fasc. 1, Tav. 1.

Evans, G. O., and *H. K. Hyatt.* 1957. The genera *Podocinum* Berl. and *Podocinella* gen. nov. (Acarina: Mesostigmata). Ann. and Mag. Nat. Hist. Ser. 12, 10: 913-932.

BOOK NOTE

INSECT SOUNDS. P. T. Haskell. Quadrangle Books, Chicago, 1961. 189 p. 97 fig. $5.75.

For the past 15 years our knowledge of insect sounds and their significance has been advancing rapidly. Haskell's book is an attempt to describe briefly what is known about insect sounds and what problems are awaiting investigation. The book begins with chapters on recording and analyzing insect sounds, sound-producing mechanisms, and insect hearing. The remainder of the book deals with various aspects of behavior associated with sounds produced and received by insects. Possible uses of sound in insect control are discussed.

No comprehensive bibliography on insect sound production is included, but one has been published elsewhere (Mable Frings and Hubert Frings. 1960. *Sound Production and Sound Reception by Insects—A Bibliography.* Penn. State Univ. Press).

A better index would have made the book more useful for reference. For example, tree crickets (*Oecanthus*) are discusseed on p. 15, 111, 126, 155, 168, 175, and 177 but the only entry in the index is "*Oecanthus*, 126".

Haskell's book is the best general account of insect sounds available.—TJW.