
A NEW SPECIES OF *TUCKERELLA* FROM SOUTH DAKOTA ¹
AND A KEY
WITH ILLUSTRATIONS OF ALL KNOWN DESCRIBED SPECIES

BY

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SUMMARY

A new species belonging to the family Tuckerellidae, *Tuckerella hypoterra* n. sp. is described being found in below ground soil samples of range grass pastures. A key to all known members of the family is included.

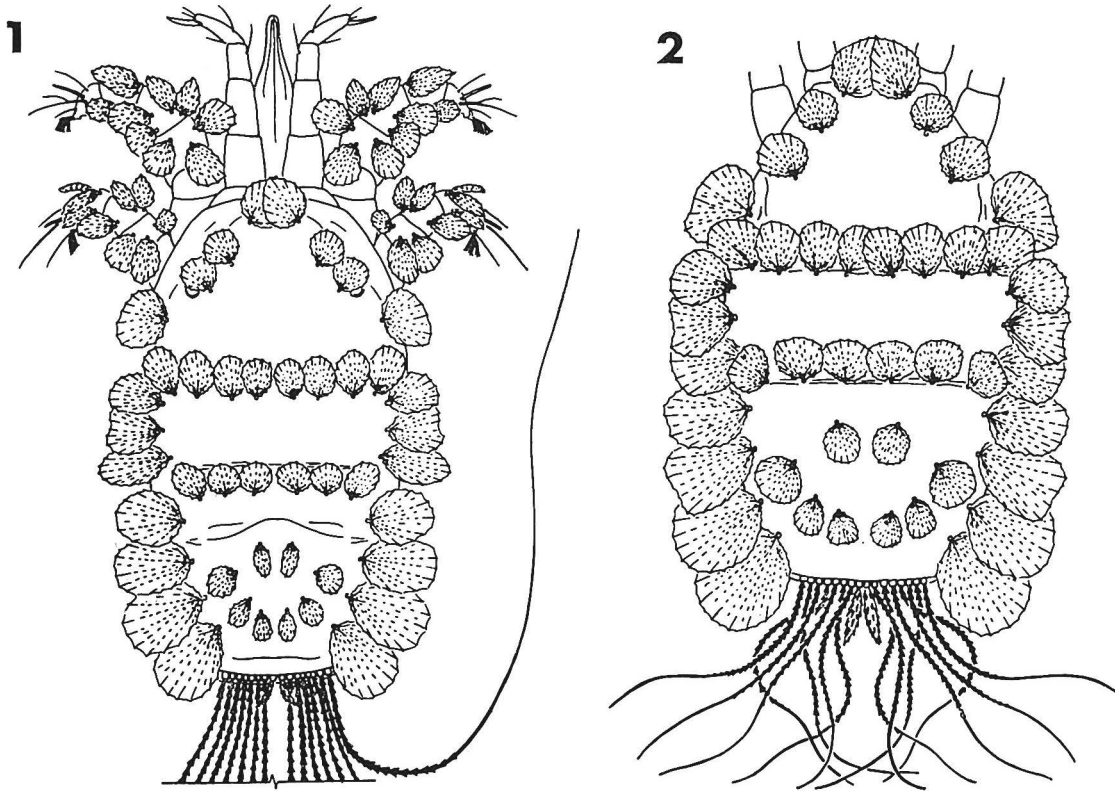
RÉSUMÉ

Une nouvelle espèce appartenant à la famille *Tuckerella hypoterra* n. sp. trouvée dans les prises souterraines de la prairie. Un clef de tous les membres connus de la famille est inclus.

BAKER and PRITCHARD (1953) referred to members of the genus *Tuckerella* Womersley as "odd plant-feeding mites," which contained only 2 species; *T. ornata* (Tucker) and *T. pavoniformis* (Ewing). These have a wide distribution range with *T. ornata* having been recorded from South Africa, North and South America, and the Philippines, and *T. pavoniformis*, from Hawaii, United States, Georgian SSR, Mauritius, Japan and Formosa. WOMERSLEY (1957) added a third species, *T. spechtae*, from South Australia and MILLER (1964) described a new *Tuckerella*, *T. flabellifer* from Tasmania. JORGENSEN (1967) established the first record of a species of Tuckerellidae that he considered a native of the United States. He also erected a key to the other known species of *Tuckerella*, *T. ornata*, *T. spechtae*, *T. flabellifer*, *T. pavoniformis* and his new species, *T. coleogynis*. In a later publication, JORGENSEN (1968) redescribed *T. spechtae* Womersley. By this time all stages of this genus were known, since MILLER (1964) collected males, females, nymphs and larvae of *T. flabellifer* and established that *T. spechtae* Womersley was a male rather than a female.

Since the key erected by JORGENSEN (1967), COLLYER (1969) recorded collecting *T. flabellifer* and a new species, *T. litoralis*, from New Zealand. ZAHER and RASMY (1969) described a new species, *T. nilotica* from Egypt and included a key entitled, "key to adult females of the world known species of the genus *Tuckerella* Womersley, 1940." However, they did not include *T. coleogynis* Jorgensen and treated Womersley's *T. spechtae* as a female. PRASAD (1973) found another species, *T. indica*, a male from India.

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FIGS. 1-2 : 1) *Tuckerella coleogynis* Jorgensen, dorsal view of male ; 2) *Tuckerella coleogynis* Jorgensen, dorsal view of female.

KRANTZ (1970), in his publication "A Manual of Acarology", reported that a species of the genus *Tuckerella* Womersley was collected from the roots of plants in California. The new species described herein was also collected from beneath the soil's surface. Two females were extracted from a grazed pasture soil core 5-10 cm below the surface of the mulch level. The grazed treatment was in low range condition dominated by *Buchloe dactyloides*. *Bouteloua gracilis*, *Carex eleocharis* and *Bromis japonicus* were also important parts of the flora. The collection was made in association with studies of the ecology of the Grassland Biome, U.S. International Biological Program, Cottonwood Site, Cottonwood, South Dakota.

***Tucherella hypoterra* McDANIEL and MORIHARA, n. sp.**

(figures 3 and 4).

Female : Caudum with 7 pairs of whiplike setae, posterior one-half moniliform, pilose in structure ; anterior portion plumose, anterodistal sensory rod on tarsus I longer than posterodistal sensory rod, as long as claw and pulvillus, curved ; posterodistal sensory rod very short, capitate, directly behind anterodistal sensory rod ; rostrum and palpi approximately equal in length, palpi well developed, bearing two apical setae ; stylets recurved basally, rostrum with 2 vertical setae placed just above coxae of palpi, these pilose, rostrum covered by extension of gnathosoma. Dorsum with typical fan-shaped setae characteristic of family, distributed as follows : propo-

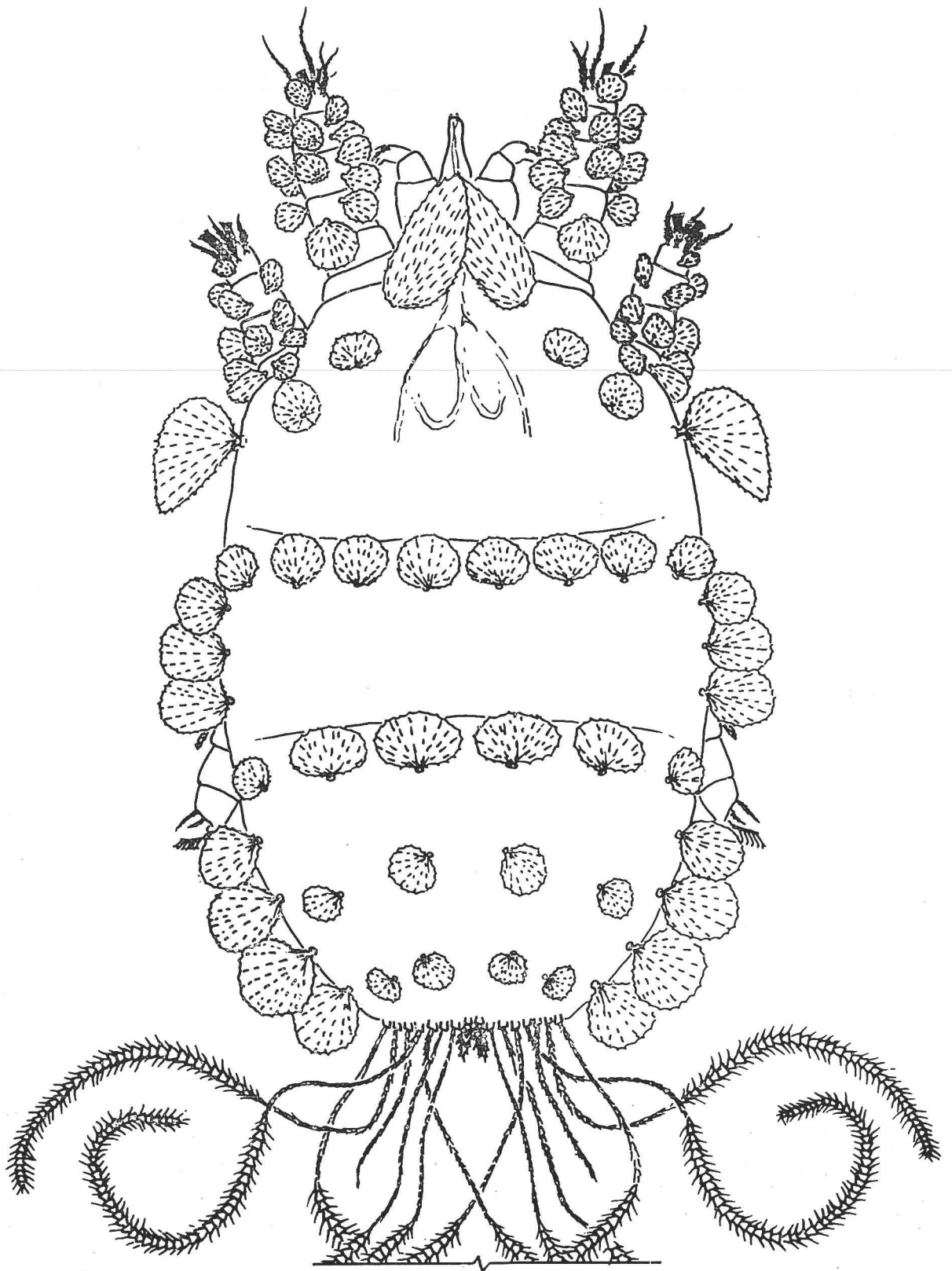


FIG. 3 : *Tuckerella hypoterra* McDaniel and Morihara, n.sp., dorsal view of holotype female.

dosomal region with 4 pairs of fan-shaped setae, first pair large, elongate, located on anterior margin of gnathosoma just posterior to gnathosoma extension covering rostrum, extending in length to middle of second papal segment and base of vertical setae of rostrum, second pair submedially each side of basal region of stylet, not elongate as in first pair, fan-shaped, smaller than first and third propodosomal setae, third pair placed above coxae of legs II, similar in structure to second pair of propodosomal setae, fourth pair on lateral margin of propodosoma much larger, pilidiform in shape, rounded on anterior margin, pointed on posterior margin as in Fig. 3. Metapodosoma region with 14 fan-shaped setae, 8 in a transverse series behind suture marking delineation of propodosomal and metapodosomal regions, 3 each on lateral margins of each side of the body. Opisthosoma with 22 fan-shaped setae, 6 in a transverse series behind suture marking delineation of metapodosomal and opisthosomal region, 8 setae on outer margin of opisthosomal region, these larger than other setae on opisthosoma, more elongate, inner regions of opisthosoma with 2 rows 4 setae, anterior row similar to but smaller than those in transverse row near suture separating metapodosoma and opisthosoma, outer marginal pair placed posterior to submedian pair, posterior row smaller than all other dorsal fan-shaped setae, submedian pair placed anteriorly to outer lateral pair. Ventral region with pilose setae, genital region with 9 pairs of setae as shown in Fig. 4. Caudal region with 14 long whip-like setae arising from tuberclelike setal bases, with a single pair of short fan-like setae (different in shape and structure than dorsal fan-like setae) arising in the middle of the body with 7 whip-like setae on either side, these arising from same type of tubercle setal base as whip-like caudal setae. Legs I and II with fan-shaped setae on all segments, a pair located on ventral surface, other ventral setae on legs pilose, rod-like sensory setae on tarsus I, anterodistal sensory setae elongate, curved, posterior sensory setae capitate, very small, tarsus II with single small rod-like sensory setae, similar to anterodistal sensory setae of tarsus I, but smaller, legs III with fan-shaped setae, legs IV with fanlike setae.

Type date : Female holotype and single female paratype collected from pasture soil, 5-10 cm below mulch layer, extracted from core sample in a modified Berlese funnel adapted for collecting soil-inhabiting invertebrates, Jackson Co., Cottonwood Range Field Station Cottonwood, South Dakota, I.B.P. Rep. II, plot 1, July 12, 1973, B. McDaniel. Additional collected specimens of *T. hypoterra* n. sp. were collected from the I.B.P. Pawnee Site, Nunn, Colorado by John W. Leetham, with the following slide data : soil cores taken April 14, 1972, Treatment 6, Replicate 2, host — *Bouteloua gracilis*, May 23, 1972, Treatment 5, Replicate 1, host — *B. gracilis*.

Remarks : *T. hypoterra* n. sp. may be distinguished from *T. pavoniformis* and *T. ornata* by the 7 pairs of whip-like setae on the posterior region of the body, where *T. pavoniformis* has 6 such caudal setae and *T. ornata* only has 5 pairs. In addition, *T. hypoterra* has the last pair of submedian fan-shaped setae of opisthosoma placed anteriorly to outer lateral setae of opisthosoma. This is similar to that found in *T. ornata* but opposite to that found in *T. pavoniformis* and *T. coleogynis*. In *T. hypoterra* the posterodistal sensory rod on tarsus I is capitate and very small, in *T. ornata* the posterodistal sensory rod of tarsus I is as long as but thicker than anterodistal sensory rod and in *T. coleogynis* the distal sensory rod is about twice the length of the proximal sensory rod. The shape and size of the dorsal fan-like setae vary in structure between *T. hypoterra* and either *T. pavoniformis*, *T. ornata*, or *T. coleogynis*, and the arrangement of the genital setae, and shape of female ventral opisthosoma is distinctive.

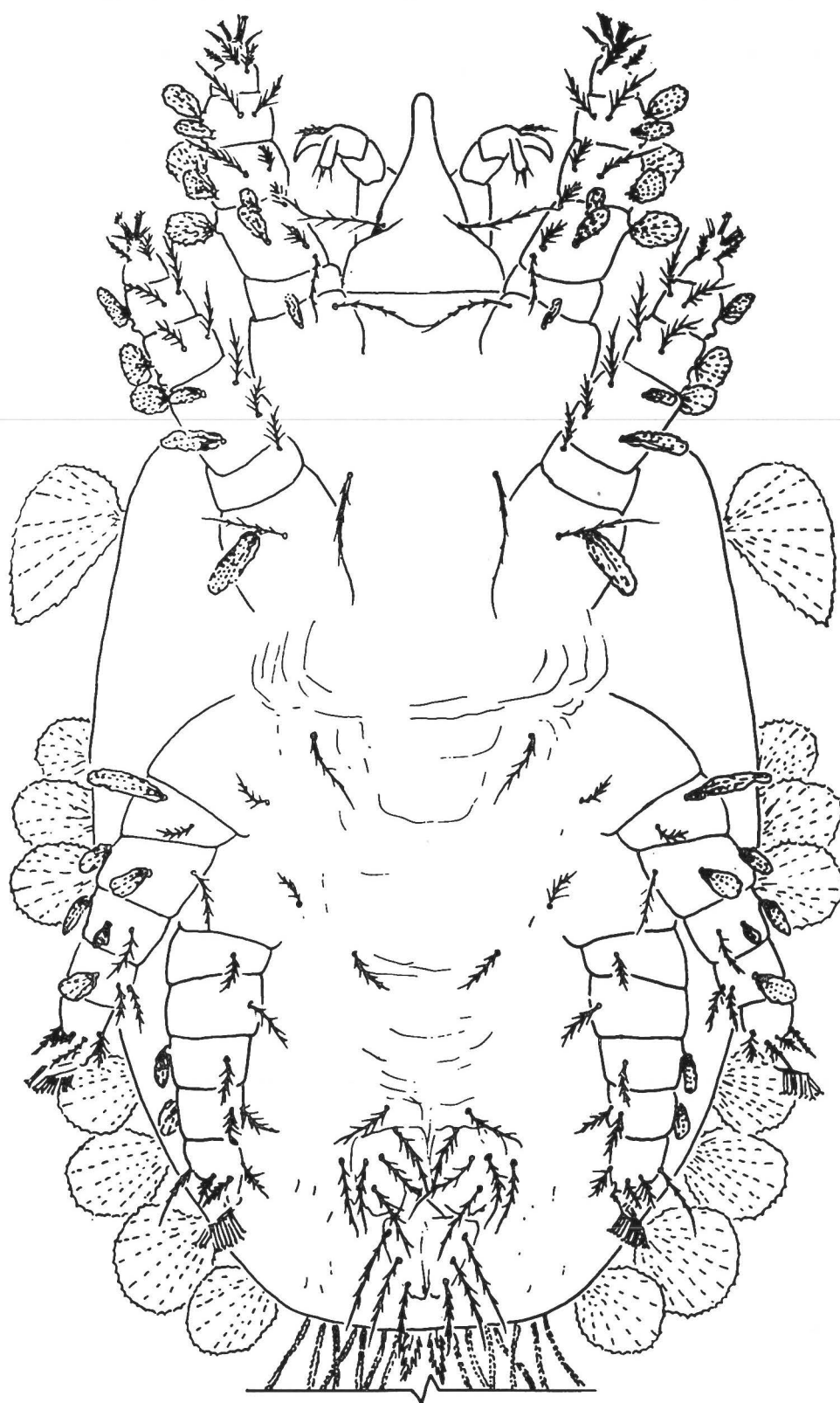
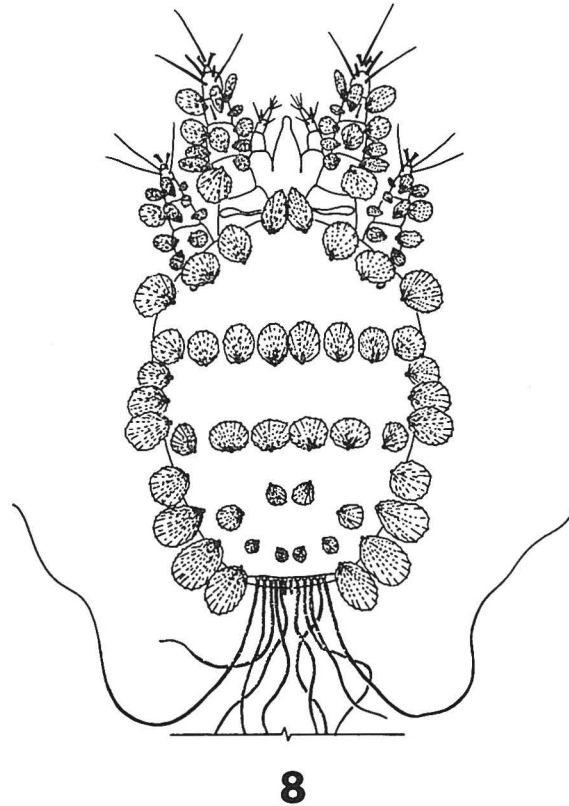
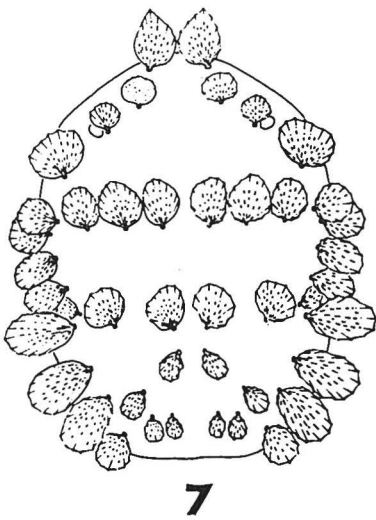
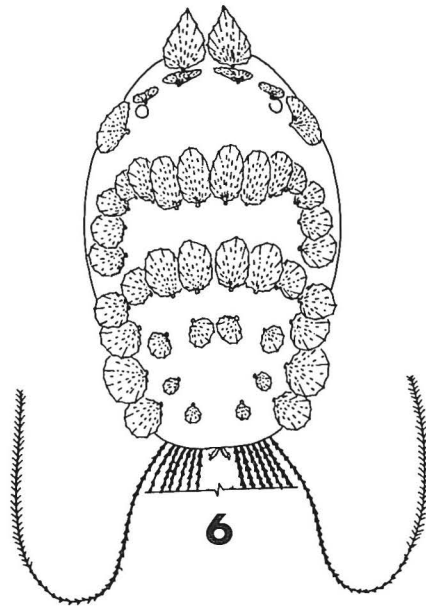
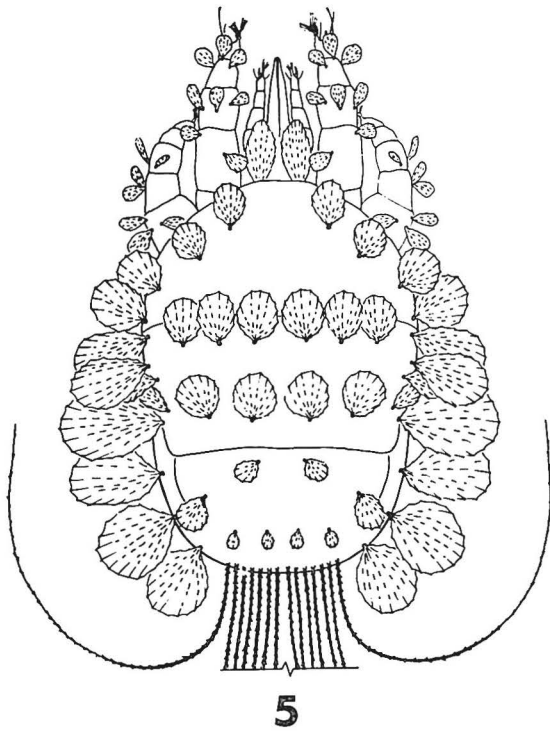
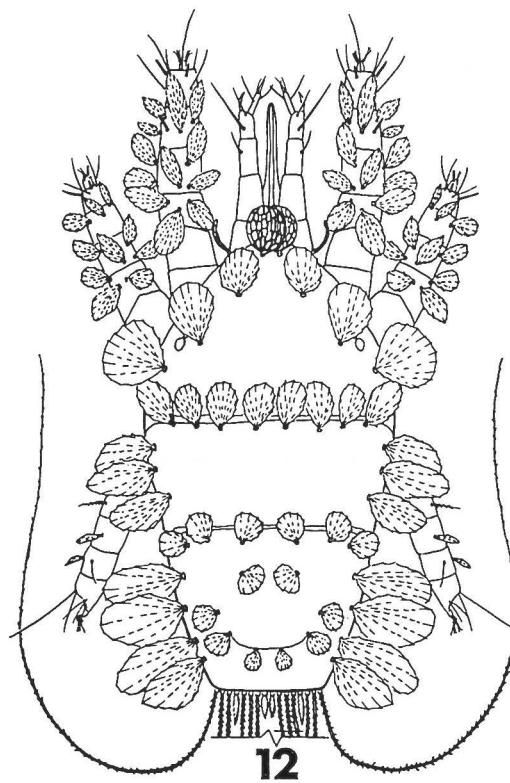
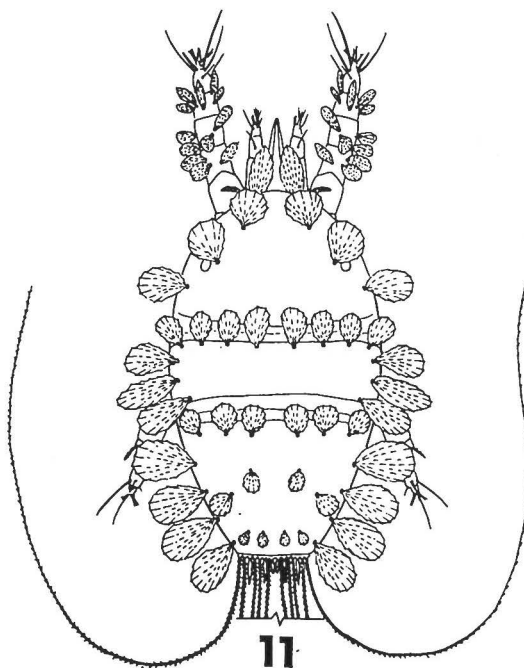
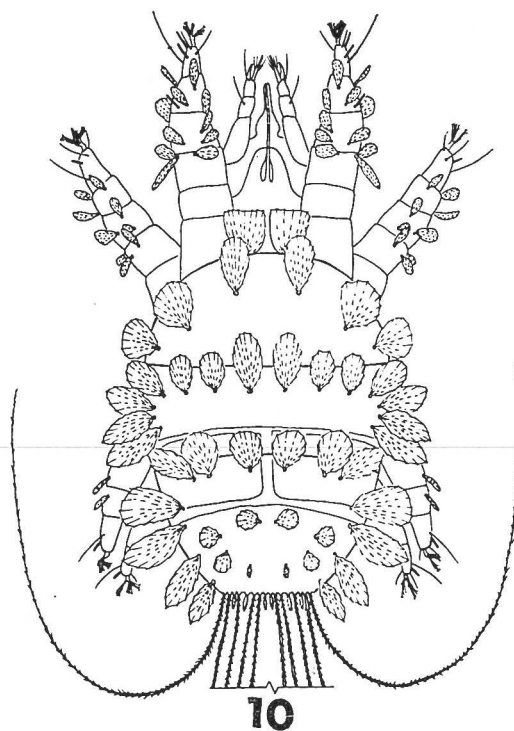
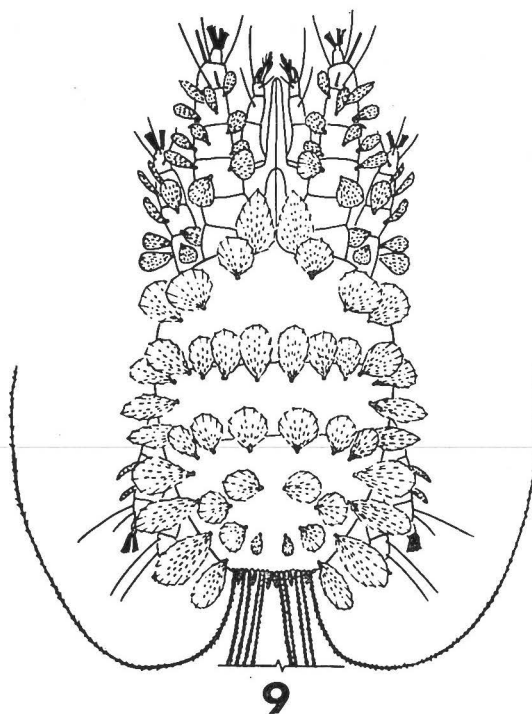


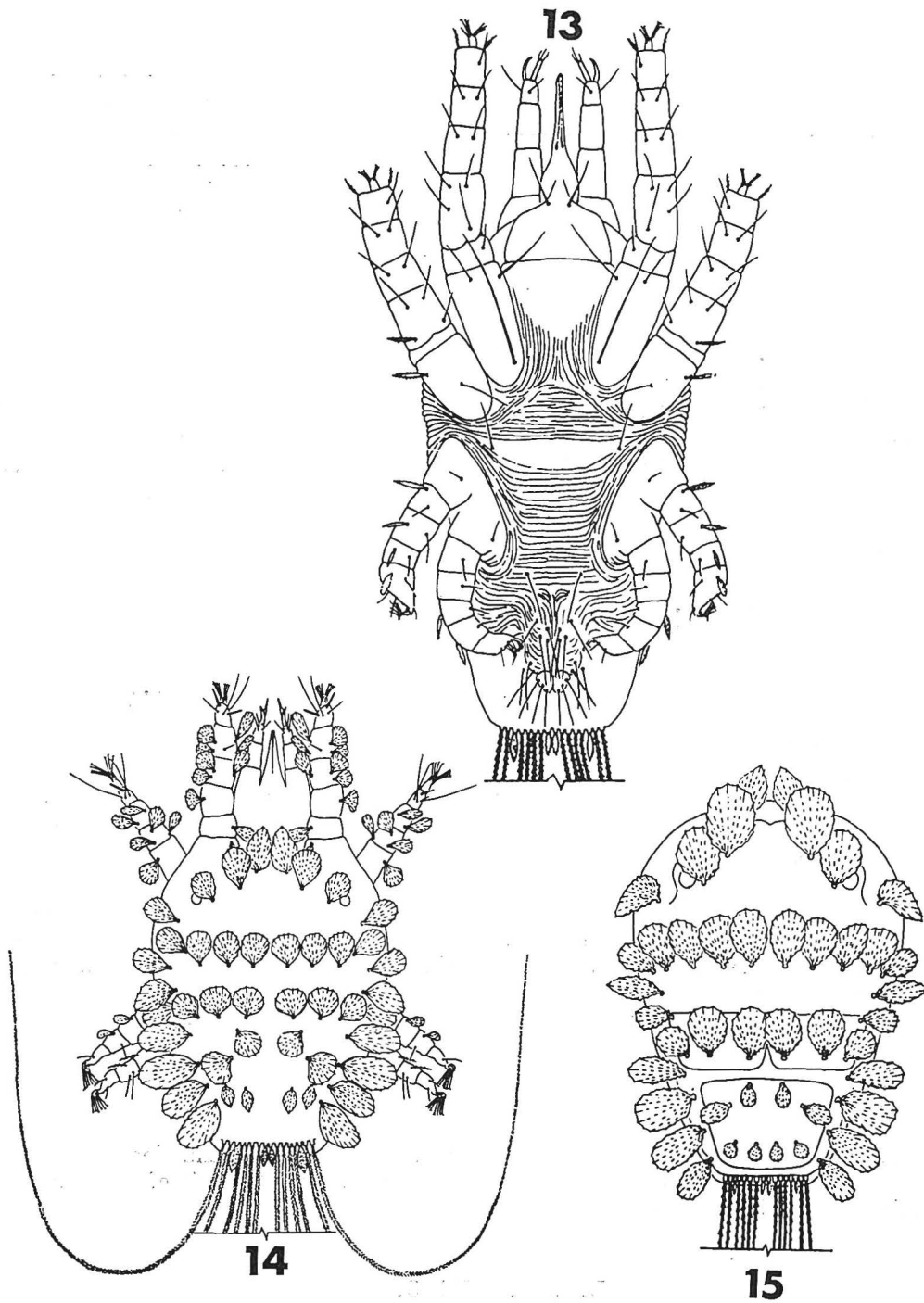
FIG. 4 : *Tuckerella hypoterra* McDaniel and Morihara, n.sp., ventral view of holotype female.



FIGS. 5-8 : 5) *Tuckerella spechtae* Womersley, dorsal view as figured by Womersley of the male ; 6) *Tuckerella spechtae* Womersley, dorsal view of female, after Miller 1964 ; 7) *Tuckerella spechtae* Womersley, dorsal view of male, after Miller 1964 ; 8) *Tuckerella litoralis* Collyer, dorsal view of female.



FIGS. 9-12 : 9) *Tuckerella flabellifer* Miller, dorsal view of female ; 10) *Tuckerella flabellifer* Miller, dorsal view of male ; 11) *Tuckerella ornata* (Tucker), dorsal view of female ; 12) *Tuckerella pavoniformis* (Ewing), dorsal view of female.



FIGS. 13-15 : 13) *Tuckerella pavoniformis* (Ewing), ventral view of female ; 14) *Tuckerella nilotica* Zaber and Rasmy, dorsal view of female ; 15) *Tuckerella indica* Prasad, dorsal view of male.

KEY TO THE SPECIES OF THE GENUS *Tuckerella* WOMERSLEY.

1. Opisthosoma with 7 pairs of long caudal setae..... 2
Opisthosoma with less than 7 pairs of long caudal setae..... 5
2. Opisthosomal long caudal setae unequal in length (third pair from lateral margin shorter, but similar in structure, Figs. 3 and 4)..... 3
Opisthosomal long caudal setae all equal in length..... 4
3. Last 4 palmate setae on dorsum with outer pair smaller than inner pair, inner pair placed anteriorly to outer pair, posterodistal sensory rod of tarsi I capitate... (United States, South Dakota, Colorado) *hypoterra* McDaniel and Morihara n. sp. (Figs. 3 and 4)
Last 4 palmate setae on dorsum subequal, inner pair placed in a straight line with outer pair in male, outer pair placed anteriorly to inner pair in female, posterodistal sensory rod of tarsi I not capitate... (South Australia) *spechtae* Womersley (Figs. 5, 6, and 7).
4. First pair of dorsal setae on propodosomal region fan-shaped, similar to other propodosomal setae.... (United States, Nevada) *coleogynis* Jorgensen (Figs. 1 and 2)
First pair of dorsal setae on propodosomal region not similar to other propodosomal setae, irregular in shape.... (Argentina, Buenos Aires) *elegans* Rossie de Simons.
5. Opisthosoma with 5 pairs of long caudal setae..... 6
Opisthosoma with 6 pairs of long caudal setae..... 8
6. Opisthosomal long caudal setae unequal in length (third pair from lateral margin shorter but similar in structure)..... (New Zealand) *litoralis* Collyer (Fig. 8)
Opisthosoma long caudal setae equal in length (third pair from lateral margin equal to other caudal setae) 7
7. Last 4 palmate setae on opisthosoma unequal, lateral pair larger than medial pair.....
(Tasmania, New Zealand) *flabellifer* Miller (Figs. 9 and 10)
Last 4 palmate setae on opisthosoma subequal in size.....
(South Africa, N. & S. America, Philippines) *ornata* (Tucker) (Fig. 11)
8. Last 4 palmate setae on opisthosoma unequal, lateral pair larger than medial pair.....
(Hawaii, U.S., Georgian SSR, Mauritius, Japan, Formosa) *pavoniiformis* (Ewing) (Figs. 12 and 13)
Last 4 palmate setae on opisthosoma with lateral pair subequal to medial pair..... 9
9. Last 4 palmate setae on opisthosoma with apex pointed, anterodistal sensory rod longer than posterodistal sensory rod of tarsi I; tarsi II with 2 sensory rods.....
(Egypt) *nilotica* Zaher and Rasmy (Fig. 14)
Last 4 palmate setae on opisthosoma with apex rounded..... 10
10. Anterior pair of propodosomal setae elongate, much longer than second propodosomal setae; proximal solenidion of tarsus I shorter than distal solenidion; hysterosoma reticulate pattern irregular.... (Tailand, Bangkok) *Knorri* Baker and Tuttle Anterior pair of propodosomal setae egg-shaped, shorer than second propodosomal setae; hysterosoma reticulate pattern regular... (India) *indica* Prasad (Fig. 15)

ACKNOWLEDGMENT

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ADDENDUM

- Since the paper was in press two additional species belonging to the family Tuckerellidae have been discovered, one described by ROSSI DE SIMONS, N.H., *Tuckerella elegans* in 1972 from Argentina and *T. Knorri* Baker and Tuttle in 1975 from Thailand.
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