

Article II. — NEW ACARINA. PART II. — DESCRIPTIONS OF
NEW SPECIES AND VARIETIES FROM IOWA, MISSOURI,
ILLINOIS, INDIANA, AND OHIO.

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PLATES I-IV.

This paper, Part II of my 'New Acarina,' has been written in accordance with the general plan of the series outlined in the preface to Part I.¹ Here are described, from five of our north central States, twenty-five new species and three new varieties. Some of these new species are rare, in fact a few of them are so rare that diligent search in the localities where they were discovered resulted in the capture of but a single individual. In other cases several or many specimens were secured. A few species here described are abundant in the localities where they were first found.

I have thought it advisable to erect a new genus, *Tegoribates*, for one of the rare beetle mites which was collected from the sand dune region around the southern end of Lake Michigan. It is quite peculiar among the members of its group in having the cephalothorax covered with a hood-like structure which projects forward from the anterior margin of the abdomen.

All of the forms described in Part II, have been collected from the upper austral life zone.

Genus *Bdella* *Latreille*.

Bdella tenuirostris, new species.

Plate I, Fig. 20.

A rather small species with short palpi. Alcoholic specimen yellowish. Cephalothorax cone-shaped. Beak fully as long, if not longer than cephalothorax proper. Palpi short, about three fourths as long as beak; second segment longer than the last three segments taken together; segment III and IV subequal in length, but III is much the broader of the two; last segment about equal in length to III plus IV, not broadened at its tip, and bearing distally the two long tactile bristles, which are of about equal length. Eyes subequal, contiguous. Post-rostral bristles of cephalo-

¹ New Acarina. Part I. General Considerations and Descriptions of New Species from Minnesota, Wisconsin, and Michigan. Bull. Amer. Mus. Nat. Hist., XXXII, pp. 93-121, pll. vii and viii. May 31, 1913.

thorax situated about two thirds their length from the base of the rostrum. Two pairs of posterior superior bristles of about equal length, the outer pair situated just next to the eyes. Abdomen broadly rounded behind, and clothed sparsely with moderate simple setæ. Legs large, posterior pair largest, and extending beyond the tip of the abdomen by the full length of the last two segments. Length including beak, 1.08 mm.; width, 0.38 mm.

From Xenia, Ohio; under a stone; by the writer.

This species is characterized by its very short palpi. Only a single specimen found, which I would be inclined to consider immature if it did not have the abdomen swollen with eggs.

***Bdella peregrina* Banks, var. *iowaensis*, new variety.**

Similar to Banks's species but smaller. Body stouter than in *B. peregrina* of Banks. Length including the beak, 1.39 mm.; width, 0.71 mm.

From Ames, Iowa; under a stick, in the woods; by J. E. Guthrie.

Rare. It may be that this form should be considered a distinct species, yet I find that the palpal characters, which are very important in the genus *Bdella*, are the same as in Bank's *B. peregrina*.

Genus ***Scirus* Hermann.**

***Scirus simplex*, new species.**

Plate I, Fig. 21.

A rather small pale species. Cephalothorax small. Beak long, slender toward distal end. Palpi large, strong, extending beyond the tip of the beak by one half the length of the distal segments. Segment I of palpus ring-like, small; segment II stout, about as long as broad, without hairs; segment III almost subequal to II; segment IV much smaller than III, slightly longer than broad, with a rather prominent hair on its inner aspect, and a small hair on its outer distal aspect; last segment slender and ending in a claw, about as long as III plus IV and with at least five hairs or setæ. The setæ of this last segment are distributed as follows: Two moderate setæ, arising from small tubercles on the inner surface, the posterior of which is the larger; one seta just below the distal claw; a very long tactile seta above distal claw, about one half as long as distal segment itself; a rather small seta about its length behind this long tactile seta. Hairs arising from pseudostigma-like pores on dorsal surface of cephalothorax, simple, very long and slender, about as long as length of cephalothorax. Abdomen clothed with a few small simple setæ. Legs almost subequal, the posterior pair slightly the largest, the anterior pair when extended reach the tips of the palpi. All the legs sparsely clothed with simple hairs. Length, including beak, 0.60 mm.; width, 0.22 mm.

From Urbana, Illinois; in refuse hog hair; by J. Zetek.

Described from one specimen, the type. This species is especially characterized by the absence of spines from the palpi.

Genus **Eupalus** Koch.

Eupalus parvus, new species.

Plate I, Fig. 22.

A very small pale species. Cephalothorax about as broad as long, chitinized around the base of the beak. Palpi slightly surpassing the beak; segment I very short, ring-like; segment II very long, stouter at each end than in the middle, with a prominent, simple, curved seta on the outer side; segment III claw-like, with two small hairs below near the base. Superior bristles of cephalothorax very long, simple, fully as long as the cephalothorax itself. Abdomen about two thirds as broad as long, broadest at the anterior margin, and with a few simple setæ. Legs rather short, posterior pair stoutest; anterior pair not surpassing the palpi, posterior pair extending slightly beyond the tip of abdomen. Legs with a few simple hairs. Length including beak, 0.33 mm.; width, 0.14 mm.

From Ames, Iowa; taken from oyster shell scale, *Lepidosaphes ulmi* Linn.; by T. M. McCall.

This is the species mentioned by R. L. Webster and the writer on page 130 of our joint paper: 'Mites Associated with the Oyster-shell Scale (*Lepidosaphes ulmi* Linne),' *Psyche*, Vol. XIX, pp. 121-134. It is a real enemy of the oyster shell scale, but is not very numerous here at Ames.

Genus **Raphygnathus** Dugés.

Raphygnathus pectinatus, new species.

Plate I, Fig. 23.

A tessellated species. Cephalothorax slightly smaller than abdomen. Palpi large, stout, over one half as long as first pair of legs; segment I ring-like; segment II very large, slightly swollen, about one and a half times as long as broad, with a rather prominent superior bristle; segment III short, outer margin much longer than inner; segment IV stout, curved, and ending in a strong claw; thumb cylindrical, reaching to tip of claw, with several rather long setæ. Abdomen not evenly rounded behind, broadest at anterior margin; like the cephalothorax tessellated. The abdomen bears above fourteen pectinate bristles. They are arranged as follows: A pair above near the anterior margin; a transverse row of four bristles about one

third the distance from the anterior margin of the abdomen to its tip, a similar transverse row of four bristles at about two thirds the distance from the anterior margin of abdomen to its tip, and four terminal bristles. First and last pairs of legs subequal. Second and third pairs of legs subequal, but slightly smaller than others. Tarsal claws stout. Length, 0.30 mm.; width, 0.19 mm.

From Ames, Iowa; under an old piece of wood; by the writer.

This species is close to *R. tessellatus* Ewing, but differs from this latter species in that the setæ of the body are strongly pectinate instead of being simple or almost so. The anterior legs of *R. tessellatus* Ewing are much longer than the others, while in this species they are subequal with the last pair of legs.

Genus **Tenuipalpus** *Donnadieu*.

Tenuipalpus erythreus, new species.

Plate I, Fig. 24.

A small, stout, bright red species. Cephalothorax broad, about two thirds as large as abdomen. Rostrum and palpi small, the latter surpassing the former. Palpi composed of five segments; segment II much the largest; segment IV with a large tactile bristle above, longer than the segment itself; last segment of palpi almost as broad as long with a terminal spine-like digit as long as the segment itself and with two terminal setæ, both of which are longer than the terminal digit. A single pair of eyes present, situated sublaterally slightly behind the second pair of legs. Dorsally the cephalothorax bears three pairs of clavate, pectinated setæ; one pair near the anterior margin, one pair just in front of the eyes, and one pair behind the eyes not far from the posterior margin of cephalothorax. Abdomen quite broad, broadest over the posterior pair of legs, somewhat pointed behind, and bearing four clavate, pectinated setæ along its anterior margin above, and sixteen lateral and posterior marginal setæ of a characteristic semifoliaceous and semiscale-like shape (see Fig. 24). Legs short, stout, the two posterior pairs largely concealed from view when the mite is observed from above. Tarsal appendages each consisting of a pair of stout tarsal claws, from either side of which arises a long simple, knobbed tenent hair and an onychium proper situated between the tarsal claws and composed of four pectinate elements, the outer two of which are joined at their bases to the tarsal claws and all of which surpass the latter. Length, 0.35 mm.; width, 0.17 mm.

From Ames, Iowa; shaken from branch of cedar; by the writer. From several points in Oregon; on arbor vitæ; by the writer.

Described from many specimens which I have labeled cotypes.

Genus **Erythræus** Latreille.

The two new species of *Erythræus* here described may be separated by the following key:

- I 1. Posterior pair of legs over three times as long as the body — *E. phalangiolum* n. sp.
- I 2. Posterior pair of legs about one and a half times as long as body — *E. quadratus* n. sp.

Erythræus phalangiolum, new species.

Plate I, Fig. 25.

A very long-legged phalangid-like species, being peculiar to all our mites in this respect. Dorsal groove, or crista, extending from about the middle of the body almost to the base of the rostrum, bearing at its posterior end two small simple hairs and at its anterior swollen end at least four rather large, slightly clavate setæ. Palpi fully twice as long as rostrum, and well clothed with simple and slightly curved setæ; next to last segment ending in a large, long claw; thumb cylindrical, not reaching the tip of claw and well clothed with curved and slightly pectinated setæ. Abdomen not distinct from cephalothorax and both clothed with clavate setæ which are also somewhat flattened and feathered. Legs very long; anterior pair about twice as long as body; posterior pair over three times as long as body. Tarsi of anterior legs slightly swollen, much shorter than tibiæ. Tarsi of posterior legs not swollen, less than one half as long as the very long tibiæ. Legs are sparsely clothed with bristles, those on the proximal segments bent near their bases so that they lie close to the surface on which they are situated. Length, 1.68 mm.; width, 1.35 mm.

From Xenia, Ohio; under bark of elm; by the writer.

I collected only a single specimen of this interesting species. Several others were observed, but I mistook them for immature phalangids. I was much surprised, upon later examination, to find that this one specimen was a mite. It was collected Sept. 14, 1910.

Erythræus quadratus, new species.

Plate I, Fig. 26.

No division between cephalothorax and abdomen. Posterior bristles of crista simple, about two thirds as long as the crista itself. Bristles on anterior tubercle of crista about fourteen in number, about as long as the posterior bristles but stouter and pectinate. Palpi about as long as crista; femur of palpus about one half as long as the entire palpus; antepenultimate segment of palpus about one half as long

as femur; thumb of palpus not swollen, equal to the claw, with several simple bristles. Anterior and posterior eyes equal, about their diameters apart. Abdomen almost truncate posteriorly, well clothed with curved pectinate hairs. Anterior and posterior pairs of legs subequal. Second and third pairs of legs subequal, but shorter than the other two pairs. Tarsi of anterior legs but slightly swollen, not as long as the tibiæ. Tarsi of posterior legs slightly swollen, about one half as long as tibiæ. Hairs on legs of two kinds, most of them are rather short and curved, a few, however, are considerably longer, stiff, almost straight, and stick out at about right angles to the axes of the segments. Length, 1.30 mm.; width, 0.62 mm.

From Marshall, Illinois; on smart-weed; by the writer.

Related to *E. pilosus* Banks, but differs from this species in having much longer legs and in the shape of the body.

Genus *Atomus* Latreille.

The two species of this genus here described are separated in the following key:

- I 1. Body black; anterior pair of legs almost one and a half times as long as the body — *A. niger* n. sp.
- I 2. Body reddish; anterior pair of legs but little longer than the body — *A. longilinea* n. sp.

Atomus niger, new species.

Plate II, Fig. 27.

Body black; legs reddish brown. Anterior tubercle of crista with about a dozen almost straight, stout, simple, or very slightly pectinate, bristles. Palpi about twice as long as beak; antepenultimate segment about three fourths as long as femur; penultimate segment weaker than usual; thumb not swollen, reaching the tip of palpal claw and with several simple setæ. Abdomen as well as cephalothorax clothed with curved pectinate bristles. These bristles are pectinate only on one side, where there are present from two to several rather long prongs. Anterior pair of legs longer than the body, their tarsi swollen and about three fourths as long as tibiæ. Posterior legs extending beyond the tip of the abdomen, by fully one half their length, their tarsi swollen, quite short, being not more than one half as long as the tibiæ. All the legs are clothed with two kinds of setæ, the shorter curved ones, and the longer, stiff, almost straight type which extend almost at right angles to the surface of the segments. Length, 1.17 mm.; width, 0.83 mm.

From Havana, Illinois; on grape vine; by C. A. Hart and the writer.

Related to *E. pilosus* Banks, but has a black body which is clothed with a different type of setæ. Two specimens procured.

Atomus longilinea, new species.

Plate II, Figs. 28-29.

A stout species with rather short legs. Crista very long, extending back almost to the third pair of legs. It is strongly swollen at its posterior end and at about one fourth its length from the anterior end. Posterior bristles of crista very small, and simple, anterior bristles, two in number and similar to posterior bristles. Beak rather short, conical. Palpi slightly surpassing the beak; thumb slightly swollen and slightly surpassing the claw. Eyes situated considerably behind the anterior swollen region of the crista, and also behind the second pair of legs. Body well clothed with hairs, which with low power lenses appear to be scale-like, but with higher powers are found to be short and strongly pectinate. Anterior pair of legs slightly longer than the body; tarsi swollen, about three fourths as long as tibiae. Posterior pair of legs about equal to anterior pair of legs; tarsi swollen, slightly over one half as long as tibiae. Legs clothed with but a single kind of bristle which are like those on the body only they are much longer and more pointed. Length, 2.40 mm.; width, 1.75 mm.

From Xenia, Ohio; under bark of apple; by the writer.

This species resembles somewhat the species of *Fessonina* in the nature of the body bristles and in having such a long crista. It is quite different from our other species of *Atomus*.

Genus **Eutrombidium** *Verdun*.**Eutrombidium corticis**, new species.

Plate II, Fig. 30.

A medium-sized, bright red species. Palpi stout; femur swollen, somewhat pedicellate at its base; antepenultimate segment about three fifths as long as femur, swollen and curved; penultimate segment including claws, slightly longer than antepenultimate segment; inner claw about one half as long as outer claw; thumb slightly swollen, well clothed with moderate, curved, pectinate bristles, and surpassing the largest palpal claw. Swollen area of crista with two kinds of long setae; a single pair of simple, slender setae situated on the chitinous disc, and several much stouter pectinate setae outside of disc. Body well clothed with curved, pectinate setae. Anterior legs somewhat longer than body; tarsi but very slightly swollen, about three fourths as long as tibiae. Posterior legs about equal to the anterior legs in length; tarsi not swollen, and almost as long as the tibiae. Legs clothed with but a single kind of hair, although some hairs are longer than others and doubtless are tactile. Length, 1.28 mm.; width, 0.8 mm.

From Ames, Iowa; under bark; by the writer.

Rare. Description from a single specimen. Quite different from *E. locustarium* (Walsh) and *E. magnum* (Ewing), in the shape of the body, size, etc.

Genus **Enemothrombium** Berlese.

Two new species described. They are separated as follows:

- I 1. Body clothed with pectinate setæ of the usual type; abdomen broadest behind the shoulder region, and with three prominent transverse dorsal grooves — *E. ovalis* n. sp.
- I 2. Body clothed with short, strongly and irregularly clavate, pectinate setæ; abdomen broadest at the shoulder region, and without transverse dorsal grooves — *E. penicillifer* n. sp.

Enemothrombium ovalis, new species.

Plate II, Figs. 31, 32.

Red, unicolor. Cephalothorax about as broad as long, conical. Dorsal groove extending for almost the entire length of the cephalothorax; posterior bristles of crista slender, simple, about two thirds as long as the groove itself. Palpi large, stout; femora of palpi much swollen and strongly arched; penultimate segments with long, strong, sharp claws, the inner of which is about two thirds as long as the outer; thumb slightly swollen, extending to tip of outer claw, and well clothed with hairs. Abdomen oval, broadest at the insertion of the third pair of legs, dorsally with three transverse grooves, the anterior of which is the longest. Abdomen well clothed with pectinate setæ. Anterior pair of legs about as long as the body; tarsi slightly swollen and a little longer than tibiæ. Posterior legs subequal to anterior legs; tarsi not swollen, subequal to tibiæ. Length, 1.62 mm.; width, 1.25 mm.

From Ames, Iowa; running over the ground; by the writer.

This and the following species are the first of the genus *Enemothrombium* I have found in this country. It may possibly be that some of our previously described species go into this genus, but Berlese in his monograph of the family does not place any of our described species in it.

Enemothrombium penicillifer, new species.

Plate II, Fig. 33.

A small pale species. Body long, broadest at the shoulder region. Cephalothorax conical. Crista about one half as long as cephalothorax; its posterior hairs almost as long as the crista itself. Palpi stout, about one half as long as the anterior

pair of legs; femora swollen, and arched; penultimate segment with outer claw very strong, inner claw about two thirds as long as outer; thumb of palpus slightly swollen and extending to tip of outer palpal claw. Body sparsely clothed with peculiar setæ. These setæ are short, very strongly and irregularly clavate and minutely pectinate. Legs short; anterior pair about three fifths as long as body, tarsi of anterior pair strongly swollen and about one and a half times as long as the tibiæ. Posterior pair of legs extending slightly beyond the tip of the abdomen; their tarsi not swollen and somewhat longer than the tibiæ. Legs clothed with curved, singly pectinate setæ. Length, 1.02 mm.; width, 0.57 mm.

From Marshall, Illinois; under a stone; by the writer.

This species is entirely different from *E. ovalis*. It is much smaller, different in color, shape, length of the legs, and in the kind of hairs on the body. Described from a single specimen, the type.

Genus *Allothrombium* Berlese.

Allothrombium pulvinus, new species.

Plate II, Figs. 34, 35.

A large species with a dark body and reddish legs. Cephalothorax very small in comparison with the abdomen. Palpi rather slender, as long as the first four segments of the anterior pair of legs; femora long, somewhat swollen, and pedicellate at base; thumb of palpus swollen, well clothed with hairs, and surpassing the palpal claw. Posterior eyes smaller than anterior ones and both situated on long pedicels. Abdomen broadest in front of third pair of legs, evenly rounded behind, and well clothed with strongly pectinate hairs. Anterior pair of legs about as long as the body; tarsi but slightly, if at all, swollen, equal to the tibiæ in length. Posterior pair of legs somewhat shorter than the anterior pair; tarsi not swollen and about equal to the tibiæ. The tarsus of each leg is provided with two strong claws and a pulvillus composed of two equal elements; these are brush-like and extend to the tip of the tarsal claws. Length, 3.30 mm.; width, 2.50 mm.

From Marshall, Illinois; under an old log; by the writer.

Described from two specimens. This is the only species of *Allothrombium* I have in my collection. Berlese in his monograph mentions no species of this genus from North America.

Genus **Trachyuropoda**.**Trachyuropoda longa**, new species.

Plate III, Fig. 36.

Reddish brown, or chestnut, color. Body about twice as long as broad, granular above, and irregularly tuberculate around the margins. Mouth-parts small. Genital opening of male circular, situated directly between the coxæ of the third pair of legs and at the middle of the sternum. Anus small, not circular, situated about its longest diameter from posterior margin of abdomen. Legs rather short, and when somewhat flexed hidden from above; first pair when extended reaching the tip of the hood-like projection at the anterior end of the body, tarsus with inner margin almost straight and hairless except for two hairs near the tarsal claws, outer margin curved, strongly chitinized and with several hairs; claws of tarsus I rather weak and situated on a tarsal pedicel which is about as long as the greatest width of the tarsus itself; last pair of legs when extended not reaching the tip of the abdomen. Length, 0.75 mm.; width, 0.47 mm.

From Xenia, Ohio; under stones; by the writer.

Rare, only a single specimen secured. I have never found this species in either Illinois or Iowa, where I have done extensive collecting for many years.

Genus **Tegoribates**, new genus.

Lamellæ and translamella absent. Pseudostigmatic organ not foliaceous or rod-like. Tectopedia I and II absent. Abdomen about as broad as long but not spherical. Pteromorphæ wing-like, truncate in front, and not extending beyond the anterior margin of abdomen. Abdomen hairless. Legs moderate, not moniliform; femora II without prominent cusps; ungues tridactyle.

Type *T. subniger*, new species.

This genus is created to include a new form I have found which differs from all the other *Pterogasterea* in the possession of a hood-like covering over the cephalothorax. It is without lamellæ and translamella, but instead has the cephalothorax covered above by this hood-like, or roof-like, structure which projects forward from the anterior margin of the abdomen, and extends beyond the tip of the rostrum.

Tegoribates subniger, new species.

Plate III, Fig. 37.

A dark, almost black species. Cephalothorax about one third as long as abdomen. Lamellæ, translamella, lamellar hairs and interlamellar hairs absent. Hood, or roof, of cephalothorax, about as broad as long, extending from one pseudostigma to the other laterally, and forward to beyond the rostrum. When viewed from the side this hood is seen to be distinct from the dorsal integument of the cephalothorax and may in fact be lifted up above the latter. Pseudostigmatic organs clavate, simple, and pointed at their tips. Abdomen about as broad as long, hairless above; pteromorphæ when viewed from the side, seem to be evenly rounded along their ventral margins, without cusps or emarginations. Legs rather small; anterior pair extending beyond the tip of the rostrum, but posterior pair not reaching the tip of the abdomen. Length, 0.58 mm.; height, 0.35 mm.

From Pine, Indiana; under old waste lumber; by the writer.

This species, the type of a new genus, is described from a single perfect specimen (a female) which I have had in my collection since 1907. It was collected from the sand dune region about the southern end of Lake Michigan. I have hoped to find other specimens of it, but in vain.

Genus **Trachyoribates** *Berlese*.**Trachyoribates zeteki**, new species.

Plate III, Fig. 38.

Shiny, light brown. Cephalothorax separated from abdomen by a transverse ridge. Lamellæ prominent, two thirds as long as cephalothorax, with rather prominent cusps. Translamella a mere ridge or line. Interlamellar hairs, long, almost straight, pectinate, about as long as the lamellæ themselves and situated just in front of the anterior margin of abdomen. Lamellar hairs similar to the interlamellar hairs but shorter, each springs from the tip of a lamellar cusp. Outside of the true lamellæ is situated a pair of lateral lamellæ that is more spine-like than blade-like. These lateral lamellæ are curved, and extend forward almost to the tip of the rostrum. Pseudostigmatic organs strongly clavate, simple, directed forward and about one half as long as the lamellæ. Abdomen as broad as long, hairless above. Pteromorphæ large, rounded ventrally, not emarginate. Genital covers about two thirds as large as anal covers, and situated almost twice their length in front of the latter. Legs moderate; anterior pair extending beyond the tip of the rostrum by fully one half their length, tibiæ of anterior pair of legs each with a large tubercle on its dorsal distal aspect from which extends a long, simple, tactile bristle as long as the tibia itself. Claws of tarsi unequal. Length, 0.39 mm.; width, 0.31 mm.

From Urbana, Illinois; in refuse hog hair; by J. Zetek.

Rather closely related to *T. enodis* (Ewing), but differing from this species in the shape of the true and the lateral lamellæ. Described from two specimens.

Genus **Peloribates** *Berlese*.

Peloribates iowaensis, new species.

Plate III, Fig. 39.

A subspherical, shiny species. Cephalothorax separated from abdomen by a line. Lamellæ about two thirds as long as cephalothorax, broadest at their bases and gradually tapering to their anterior ends; without cusps. Translamella represented by a line. Interlamellar hairs, large, erect, pectinate, about as long as the lamellæ, and situated very near the posterior margin of cephalothorax. Lamellar hairs similar to interlamellar hairs, but slightly shorter; they extend, however, beyond the tip of the rostrum by about one half their length. Pseudostigmatic organs, clavo-lanceolate, recurved, and pectinate toward their tips. Abdomen subspherical, and provided above with about two dozen, large, curved, doubly pectinate bristles. Pteromorphæ large, somewhat pointed ventrally, not emarginate. Genital covers not more than two thirds as long as anal covers, situated about two times their length in front of the latter. Anal covers situated almost approximate to the posterior margin of ventral plate. Legs moderate; anterior pair extending beyond the tip of the rostrum by about one half the length of their tarsi. Tarsi of anterior pair of legs longer than the tibiæ. Claws of all tarsi unequal. Length, 0.50 mm.; width, 0.36 mm.

From Ames, Iowa; under an old piece of wood; by the writer.

Related to my *P. serratoseta*, but differing from it in having the abdomen much more spherical, in having the pseudostigmatic organs clavo-lanceolate, instead of strongly clavate, as well as in other respects.

Genus **Oribatella** *Banks*.

Oribatella achipteroides *Ewing*, var. **australis**, new variety.

Plate III, Figs. 40, 41.

Smaller and of a lighter color than the type of the species. In the type each lamella is produced in front into a lateral cusp. Not so in this more southern form from Iowa. In this southern form the lamellar hairs are shorter and more curved, than in the type. The pseudostigmatic organs are more slender than in the type of the species. Length, 0.47 mm.; width, 0.31 mm.

From Ames, Iowa; under a stone; by the writer.

The type of this species was collected by Professor J. E. Guthrie, from Red Wing, Minnesota. It was taken either under bark or from chips on lowland. It is quite possible that this form from Iowa should be regarded as a new species on account of several of its structural peculiarities, but at present we do not know enough about the habits of the two forms or whether or not intergrades exist.

Genus *Oribata* Latreille.

Oribata quadrisetosa, new species.

Plate III, Fig. 42.

A large, black, shiny species. Cephalothorax separated from abdomen by a transverse curved line. Superior hairs of cephalothorax very long, almost straight, and pectinate; lateral hairs, curved, pectinate and extending about one half their length beyond the tip of the rostrum. There is a much smaller, but similar pair of accessory lateral hairs, below the larger ones. Abdomen about three fourths as broad as long, evenly rounded behind, and without hairs except for four very prominent ones at the posterior margin. These are subequal and are about one half as long as the width of the abdomen. Pteromorphæ large, reaching to the tip of the rostrum, rounded anteriorly and ventrally but not broadly rounded in either case. Genital covers about three fourths as long as anal covers, and situated about one and one half times their length in front of the latter. Anterior pair of legs extending about one half their length in front of the tip of the rostrum; tarsi and tibiæ subequal, the latter each with an anterior dorsal seta-bearing tubercle. Claws of all the tarsi about equal. Length, 0.88 mm.; width, 0.63 mm.

From Xenia, Ohio; under a log; by the writer. From Muncie, Illinois; under bark; by the writer.

Closely related to *O. robusta* Banks, but has the pteromorphæ rounded, not pointed in front, also it has the four big bristles on the posterior margin of the abdomen.

Genus *Liaccarus* Michael.

Liaccarus fusiformis, new species.

Plate III, Fig. 43.

A rather small, light colored species. Two pairs of lamellæ present; inner pair, blade-like, somewhat broader toward the middle than at the ends, coming together and fusing anteriorly, but each also produced into a cusp; outer lamellæ somewhat

blade-like, but very narrow and on edge, they extend for the entire length of the cephalothorax. Interlamellar hairs very long, longer than the lamellæ, and slightly pectinate. Lamellar hairs arising from tips of lamellar cusps, long, straight, slightly pectinate, and extending for one half their length beyond the tip of the rostrum. Near the tip of the rostrum is a pair of hairs similar to the lamellar hairs, but smaller and curved somewhat. Pseudostigmatic organs slightly bent outward, fusiform, and slightly pectinate at their tips. Abdomen hairless above. Genital opening circular, about its diameter in front of the anal opening; anal opening much larger than genital opening. Legs moderate; anterior pair extending fully one half their length beyond the tip of the rostrum; tibia I and tarsus I subequal, tibia I without anterior tubercle, but with a long tactile hair which extends much beyond the tip of tarsus. Claws of tarsi unequal. Length, 0.63 mm.; width, 0.41 mm.

From Ames, Iowa; under an old piece of wood; by the writer.

This species is near *L. magnilamellatus* Ewing, but differs from it in having the fusiform pseudostigmatic organs instead of clavo-lanceolate ones with very long pedicels.

Genus *Cultroribula* Berlese.

***Cultroribula confinis* Berlese, var. *magna*, new variety.**

Plate III, Fig. 44.

In this variety the pseudostigmatic organs are much shorter than they are in Berlese's form. Prominent interlamellar hairs are present, and the variety is also larger than the type of the species. Length, 0.66 mm.; width, 0.52 mm.

From Urbana, Illinois; under bark of hackberry; by the writer.

Described from two specimens, one of which had a harvest mite larva attached to it.

Genus *Oribatula* Berlese.

***Oribatula clavata*, new species.**

Plate IV, Fig. 45.

Light brown, shiny. Cephalothorax large, broadest between first and second pair of legs. Lamellæ slightly over one half as long as the cephalothorax, of equal width throughout, and joined together anteriorly by the translamella which is of equal breadth with the lamellæ. Superior bristles long, divergent, slightly curved, and pectinate. Lamellar hairs subequal to superior bristles, and extending slightly

beyond the tip of the rostrum. Pseudostigmatic organs clavate, simple, recurved, about three fifths as long as the lamellæ. Abdomen almost twice as long as broad, shoulder regions with a much thickened layer of chitin. Above, the abdomen has four small, oval, light spots which may be sense areas; two of these are situated far forward near the shoulders, and two a little behind the middle of the abdomen. Above, the abdomen bears about two dozen small, curved, simple bristles. Both genital and anal openings large, almost circular, the former situated about one and one half times its length in front of the latter. Legs moderate; anterior pair extending one half its length beyond the tip of the rostrum; posterior pair not reaching the tip of the abdomen. Tarsi and tibiæ of anterior legs subequal, the latter with the large distal tubercles from which extend the tactile hairs, the latter being longer than the tarsi. Claws of tarsi unequal. Length, 0.42 mm.; width, 0.29 mm.

From Arcola, Illinois; under an old board; by the writer.

A specimen of this species was sent to Banks, and he wrote that it was new.

Genus **Tegeocranus** *Nicolet*.

Tegeocranus subniger, new species.

Plate IV, Fig. 46.

Dark brown, almost black. Cephalothorax separated from abdomen by a transverse, almost straight line. Lamellæ very large, extending beyond the tip of rostrum, broadest not far from their base. No interlamellar hairs. Pseudostigmatic organs, clavate, recurved and with pectinate heads. Abdomen broader than long, evenly and broadly rounded behind, and with a few minute hairs dorsally. Shoulder expansions large, with undulating margins, reticulate, and extending forward beyond the anterior margin of the abdomen. Genital covers, subrectangular, situated about two thirds their length from the larger, subrectangular anal covers. Legs large; anterior pair extending beyond the tip of the rostrum by about the full length of their tarsi; tibiæ of anterior legs without anterior tubercles; posterior pair of legs extending beyond the tip of the abdomen by about one half the length of their tarsi. Tarsi of legs each with a single, stout, curved claw. Length, 0.72 mm.; width, 0.57 mm.

From Ames, Iowa; under old pieces of wood on the ground; by the writer.

This species is fairly abundant here at Ames under old pieces of wood. It is in fact one of our most common large beetle mites. I have used it for internal anatomy studies, and find it excellently adapted for such purposes.

Genus **Damæus** C. L. Koch.

The two species of this genus here recorded and described are separated as follows:

- I 1. Cephalothorax moderate, without superior bristles; abdomen somewhat pointed behind; tarsi and tibiæ both swollen and pedicellate — *D. minutus* n. sp.
- I 2. Cephalothorax large, with two pairs of superior bristles; abdomen broadly rounded behind; tarsi very short and strongly swollen at their bases; tibiæ but little, if at all, swollen — *D. brevitarsus* n. sp.

Damæus minutus, new species.

Plate IV, Fig. 47.

Minute; light yellowish brown, shiny. Cephalothorax large, broadest just in front of the pseudostigmatic organs, slightly sculptured above near the posterior margin. Cephalothorax hairless, except for the small, very strongly curved, singly pectinate rostral hairs near the tip of the rostrum. Pseudostigmatic organs large, clavo-lanceolate, pectinate, almost straight, and about as long as femora II. Abdomen about two thirds as broad as long, pointed at the tip, with about twenty, small, simple, curved bristles above. Genital covers, rectangular, each about twice as long as broad, situated about twice their length from the larger but more circular anal covers. Legs prominent, but short for the genus; anterior pair extending beyond the tip of the rostrum by over one half their length, tarsi longer than tibiæ, tibiæ each with a long tactile hair at its tip above, which extends beyond the tip of the tarsi. Coxæ of third pair of legs subspherical in shape, each with a small tubercle on its anterior aspect and a single strongly curved, singly pectinate bristle. Posterior legs extending beyond the tip of the abdomen by the full length of their tarsi. Most of the segments of the legs are moderately swollen toward one end, and pedicellate at the other end. Length, 0.28 mm.; width, 0.14 mm.

From Illinois; situation not known; collector not known.

I have but a single specimen of this very minute and rare species. It is well preserved.

Damæus brevitarsus, new species.

Plate IV, Fig. 48.

Body long, and legs short for the genus. Cephalothorax very large, two thirds as long as the abdomen, with two superior sculptured ridges in front of the pseudostigmata. These ridges are about one third as long as the cephalothorax and curved inward. Tectopodia present for first pair of legs, and between legs II and III is

located a large tubercle on each side of the cephalothorax. Superior bristles short, pectinate, situated slightly in front of the pseudostigmata. In front of the chitinous ridges is situated a large pair, of simple straight bristles which extend beyond the tip of the rostrum. Pseudostigmatic organs very long, clavate, pectinate, somewhat longer than the femora of legs II. Abdomen longer than broad, truncate anteriorly and evenly rounded posteriorly, the shoulder regions very strongly chitinized. Above the abdomen bears about fourteen, simple, curved bristles. Genital covers subrectangular and situated their length in front of the larger, similar anal covers. Legs short for the genus, with short, globose tarsi; femora swollen but not globose though pedicellate at their bases. Anterior pair of legs extending beyond the tip of the rostrum by about two thirds their length; tarsi slightly shorter than the tibiae; tibiae each with distal tubercle and long tactile hair which extends beyond the tip of the tarsus. Tarsi of posterior legs strongly globose scarcely two thirds as long as the tibiae; tibiae not globose, bearing each a very long tactile hair distally which extends beyond the tips of the tarsi. Ungues of all tarsi unequal. Length, 0.58 mm.; width, 0.30 mm.

From Ames, Iowa; under an old piece of wood; by myself.

This species is especially noted for its large cephalothorax and for the short globular tarsi. Only a single specimen found.

Genus *Phthiracarus* Perty.

Phthiracarus pectinatus, new species.

Plate IV, Fig. 49.

Yellowish brown. Cephalothorax slightly over one half as long as abdomen, and about twice as long as high; above, it is provided with three pairs of prominent, almost straight, pectinate bristles, the posterior pair of which is the longest and the anterior pair the shortest. Pseudostigmatic organ with a rather long pedicel and an expanded head with a concave posterior margin and a convex anterior margin, simple behind but strongly pectinate in front. Abdomen almost as high as long; anterior margin emarginate where the cephalothorax is attached; behind the abdomen is somewhat pointed. Above, the abdomen bears several, curved, pectinate bristles; a longitudinal row of five bristles on each side near the median plane, below this row another row of five similar, but somewhat smaller bristles, and below this row three bristles. Genital covers about three fourths as long as anal covers. Legs stout; anterior pair extending somewhat beyond the tip of cephalothorax. Claws of all tarsi heterodactyle. Length, 0.76 mm.; height, 0.45 mm.

From Mahomet, Illinois; data on situation lost; by the writer.

Related to *P. americanus* Ewing and to *P. fulvus* Ewing, but differing from both of these species in having pectinate pseudostigmatic organs and a few other minor characters.

Genus **Pigmeophorus** *Kramer*.**Pigmeophorus quadratus**, new species.

Plate IV, Fig. 50.

Female.—Pale, flesh colored. Cephalothorax about one half as long as abdomen. Capitulum pouch-shaped, somewhat broader than femur of leg I. Sensory organs capitate, about one half as broad as femur I. Abdomen quadrate, with a very long pair of simple, almost straight shoulder bristles. These shoulder bristles are about two thirds as long as the width of the abdomen at its anterior margin. At its posterior margin the abdomen bears two pairs of prominent, simple setæ. They are about equal to one half the width of the abdomen at its posterior margin. Legs short and stout; anterior pair about as long as the cephalothorax; femur I equal to tibia I, its lateral margin being almost twice as long as its inner margin; tibia I as long as broad, and about three fifths as long as tarsus I. Posterior legs not extending beyond the tip of the abdomen; tarsus IV slender, tapering, about twice as long as tibia. Length, 0.26 mm.; width, 0.15 mm.

From Illinois; on mushroom; by Mr. Duncan.

Differs from *P. americanus* Banks in having shorter legs, and only two pairs of bristles on the posterior margin. These are quite long.

EXPLANATION OF PLATES.¹

PLATE I.

- Fig. 20. *Bdella tenuirostris* n. sp. Dorsal view, $\times 38$.
 Fig. 21. *Scirus simplex* n. sp. Right palpus from inside, $\times 240$.
 Fig. 22. *Eupalus parvus* n. sp. Right palpus from above, $\times 240$.
 Fig. 23. *Raphygnathus pectinatus* n. sp. Seta from tip of abdomen, $\times 720$.
 Fig. 24. *Tenuipalpus erythreus* n. sp. Seta from body, $\times 720$ (?).
 Fig. 25. *Erythræus phalangiolus* n. sp. Dorsal view, $\times 10$.
 Fig. 26. *Erythræus quadratus* n. sp. Dorsal view, $\times 14$.

PLATE II.

- Fig. 27. *Atomus niger* n. sp. Tip of palpus from above, $\times 240$.
 Fig. 28. *Atomus longilinea* n. sp. Dorsal groove, or crista, $\times 72$.
 Fig. 29. *Atomus longilinea* n. sp. Seta from body, $\times 320$.
 Fig. 30. *Eutrombidium corticis* n. sp. Dorsal view, $\times 14$.
 Fig. 31. *Enemothrombium ovalis* n. sp. Dorsal view, $\times 12$.
 Fig. 32. *Enemothrombium ovalis* n. sp. Seta from body, $\times 720$.
 Fig. 33. *Enemothrombium penicillifer* n. sp. Dorsal view, $\times 38$.
 Fig. 34. *Allothrombium pulvinus* n. sp. Distal part of tarsus from above, $\times 72$.
 Fig. 35. *Allothrombium pulvinus* n. sp. Seta from body, $\times 320$.

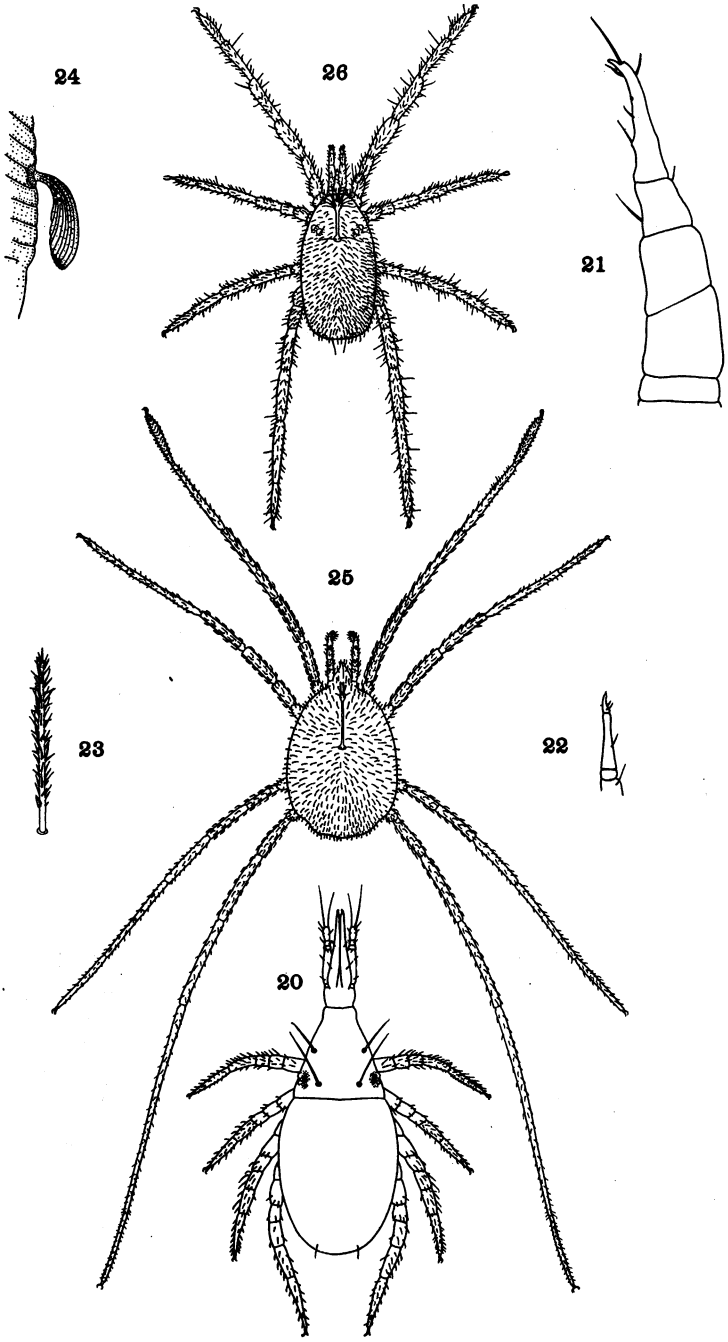
PLATE III.

- Fig. 36. *Trachyuropoda longa* n. sp. Tarsus of leg I, $\times 240$.
 Fig. 37. *Tegoribates subniger* n. sp. Dorsal view, $\times 72$.
 Fig. 38. *Trachyoribates zeteki* n. sp. Lamellæ, translamella and lamellar hairs, $\times 240$.
 Fig. 39. *Peloribates iowaensis* n. sp. Dorsal view, $\times 72$.
 Fig. 40. *Oribatella achipterooides* Ewing, var. *australis* n. var. Right lamella and lamellar hair from above, $\times 320$.
 Fig. 41. *Oribatella achipterooides* Ewing, var. *australis* n. var. Right pseudostigmatic organ from above, $\times 320$.
 Fig. 42. *Oribata quadrisetosa* n. sp. Dorsal aspect of posterior part of abdomen, $\times 72$.
 Fig. 43. *Liacarus fusiformis* n. sp. Right pseudostigmatic organ from above, $\times 320$.
 Fig. 44. *Cultroribula confinis* Berlese, var. *magna* n. var. Dorsal view, $\times 72$.

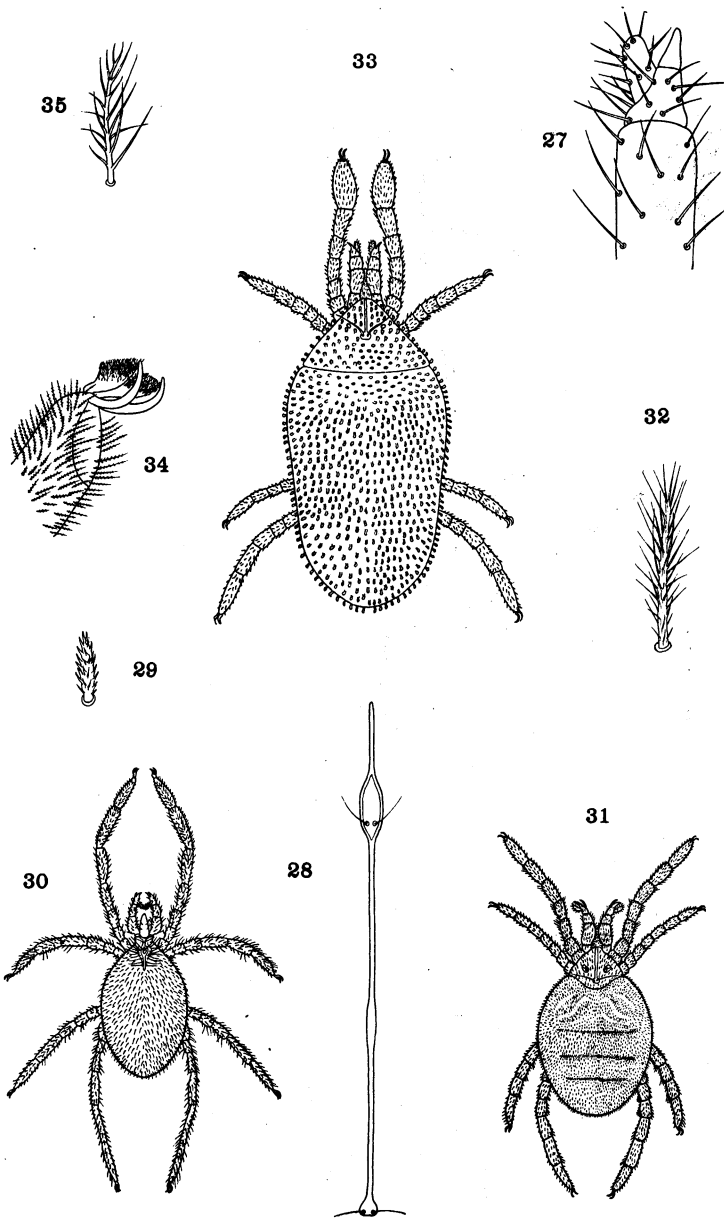
¹ All of the drawings given in this paper have been reduced to two fifths their original linear dimensions. Some of the characters represented in them, therefore, would not be distinguished at the magnifications indicated in this explanation of the plates.

PLATE IV.

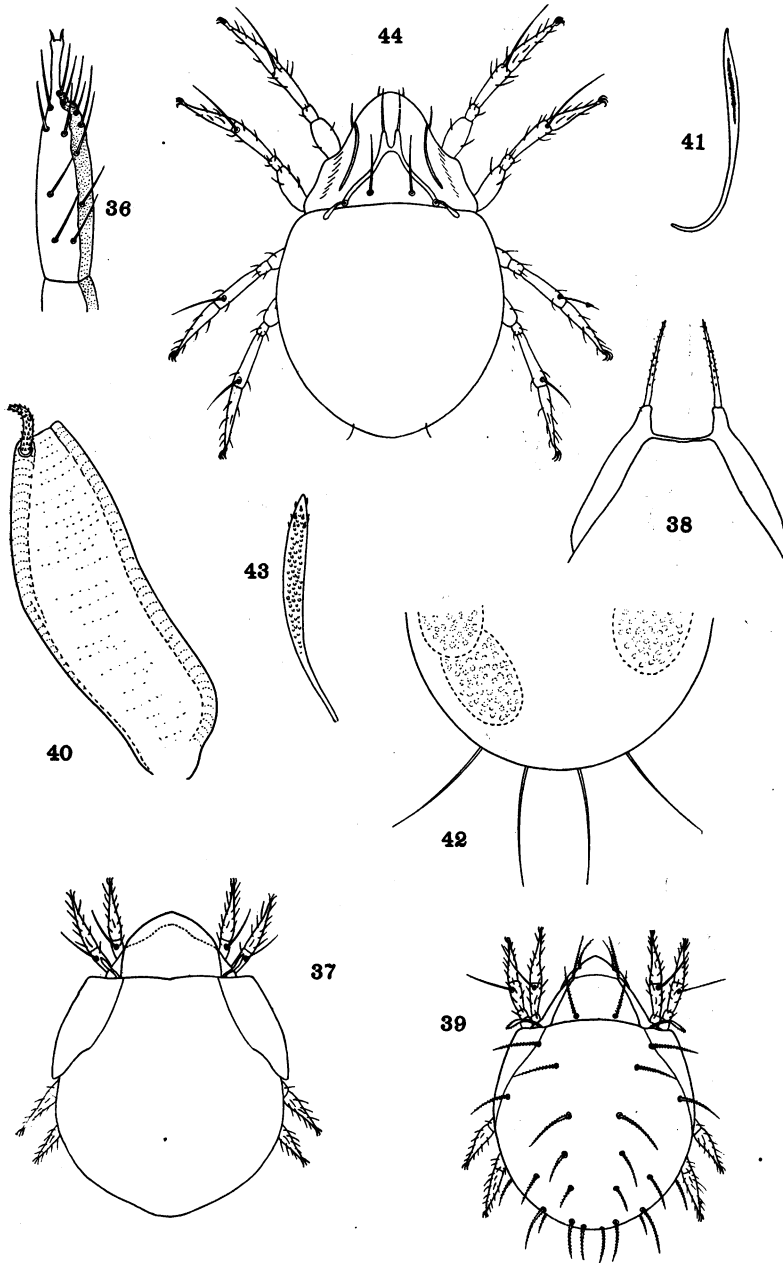
- Fig. 45. *Oribatula clavata* n. sp. Dorsal view, $\times 72$.
Fig. 46. *Tegeocranus subniger* n. sp. Dorsal view, $\times 48$.
Fig. 47. *Damæus minutus* n. sp. Dorsal view, $\times 100$.
Fig. 48. *Damæus brevitarsus* n. sp. Dorsal view, $\times 72$.
Fig. 49. *Phthiracarus pectinatus* n. sp. Right pseudostigmatic organ as seen from the outside, $\times 320$.
Fig. 50. *Pigmeophorus quadratus* n. sp. Right anterior leg from above, $\times 240$.



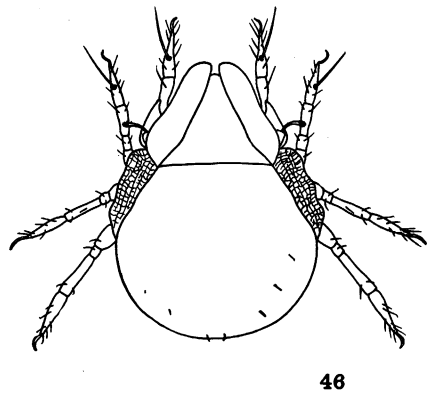
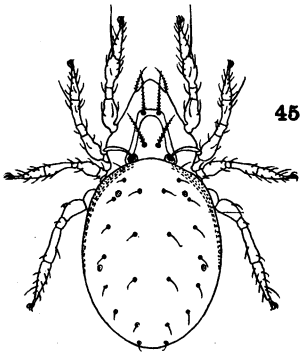
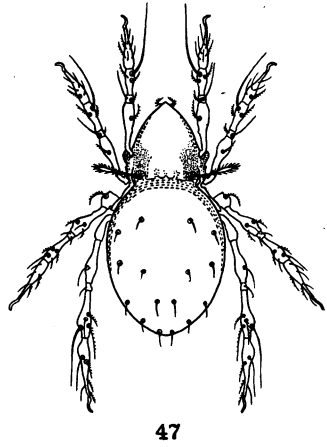
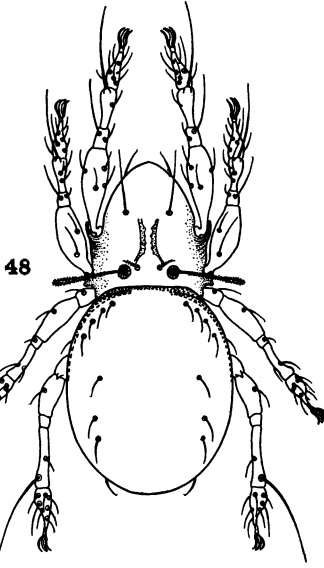
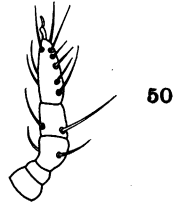
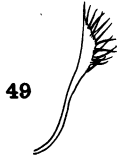
NEW ACARINA.



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