

NEW NEARCTIC SPIDER MITES OF THE FAMILY TETRANYCHIDAE.

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Interest in the taxonomy of the spider mites (Tetranychidae) in the United States has been increased during the last few years for several reasons: First, because of the realization of their great economic importance; second, because of the danger of introducing many of the most injurious exotic species; and, third, because of the difficulty found in determining correctly the most common of our species. Following the earlier work of Banks and the later work of the present writer, McGregor undertook a systematic review of the American species, and examined more critically than had been done before those characters which alone are of real specific value. As a result of his investigations several mooted questions in regard to synonymy have been cleared up. Yet the task of revision has in no way been completed, for one is constantly finding new characters and new differences which change previous judgments in regard to many points. New species also exist within our borders, and foreign ones are constantly being brought to our shores. Hence the present writer has again taken up the difficult task of taxonomic investigation of the different species, and as a result of this work here offers the description of eight new species.

Genus *OLIGONYCHUS* Berlese.

The genus *Oligonychus* Berlese (1886) is based upon a species represented as having the tarsi each provided, in addition to the tenent hairs, with a simple claw and a deflexed plumose, claw-like structure. This type of tarsal armature must be very rare in the spider mites, for recent workers have dropped the genus *Oligonychus* because they knew of no species having the tarsal appendages of the type shown by Berlese. During the last year the writer has observed two species with a deflexed, plumose, claw-like appendage to each trassus. These species also show other characters which allies them with the type species of *Oligonychus*. They are here described.

OLIGONYCHUS AMERICANUS, new species.

Plate 125, fig. 1.

A small species. Preserved specimens yellowish and not showing maculations. Mandibular plate broad, being about two-fifths as broad as long, not emarginate in front but with a deep V-shaped notch behind. Palpal thumb not swollen and not exceeding palpal claw; terminal finger moderate, about one-third as broad as thumb. Legs moderate; anterior pair exceeding the palpi by half their length; posterior pair extending beyond the tip of abdomen by the full length of tarsi and one-half the length of their tibiae. Simple claw of each tarsus almost as long as width of tarsus, with basal half but slightly and distal half strongly curved; deflexed claw about half as long and half as thick as simple claw, and with at least three hair-like barbs on its outer side. Length, 0.32 mm.; width, 0.19 mm.

Type locality.—Experimental Farm, Saskatchewan, Canada.

Type slide.—Cat. No. 24026, U.S.N.M.

Described from specimens on a single type slide. This species differs from *O. minimus* Targioni-Tozzetti in having the deflexed claw pectinate on the outside and from the following new species, to be described, in being much smaller, more slender, and in its habits. The species occurs on leaves of spruce and does considerable injury.

OLIGONYCHUS MAJOR, new species.

Plate 125, fig. 2.

Preserved specimens yellowish, or yellowish brown; body clothed with conspicuous minutely pectinate, curved setae. Mandibular plate about one-half as broad as long, not emarginate in front, but with a deep V-shaped notch behind. Thumb of palpus not surpassing claw; apical finger medium in thickness, slightly over one-third the width of thumb. Legs medium; anterior pair extending beyond tips of palpi by over one-half their length; posterior pair extending beyond the tip of abdomen by length of tarsi only. Simple tarsal claw scarcely as long as width of tarsus; slightly curved near its base, but strongly curved toward its tip; deflexed claw about one-half as stout and two-thirds as long as simple claw and with three to five prongs on outer side. Tenent hairs exceeding simple claw by almost one-half their length and terminated with distinct knobs. Length, 0.35 mm.; width, 0.21 mm.

Type locality.—Yarrow Experiment Station, Rockville, Maryland.

Type slide.—Cat. No. 24027, U.S.N.M.

Described from specimens on type slide. This species is very similar to *O. americanus*, but is much larger and of a different shape, and occurs on a host not closely related to the host of the latter. This species infests the avocado.

Genus BRYOBIA Koch.

Two species of this genus, *B. pratensis* Garman and *B. pallida* Garman, have been described in the past as new from the United States. The description of *B. pallida* was soon recognized as being based on immature individuals of *B. pratensis*; but for many years in this country the name, *B. pratensis*, has been held valid, being the scientific designation of our common brown mite, or so-called clover mite. Prior to the year 1911 the present writer sent a specimen of *B. pratensis* to Dr. A. C. Oudemans, the noted Dutch acarologist, for comparison with European forms. As a result of his comparisons he decided that our *B. pratensis* was only a synonym of *B. cristata* Dugès. This is the synonymy which he gives in a printed article published in the same year.

In 1914 Ivar Trägårdh, a Swedish authority, published the results of his extended taxonomic study of the genus *Bryobia*. In his English summary he gives the following pertinent statement in regard to synonymy in the genus:

All the different species described by Koch, G. Canestrini, F. Fanzago, Berlese, Thomas, and Garman under the name of *praetiosa*, *speciosa*, *nobilis*, *gloriosa*, *ribis*, and *pratensis*, must be referred to *praetiosa* Koch, being mere variations and different instars of that species.

Trägårdh for the first time ascertained the variations due to growth in the old species of Koch, as well as the individual variations found in the adults of the same species; and as a result of this has not only given us his very valuable list of synonyms, but has shown to what extent one can depend upon such variable characters as must be used in specific diagnosis. For the present it appears it is better to confine all descriptions of new species to adult, egg-bearing females. The variations, which are very great in the genus, must be worked out later for the different species.

There has accumulated in the United States National Museum a large number (many hundreds) of *Bryobia* specimens from almost all parts of the United States. A survey of this material shows, after eliminating variations due to growth by confining examinations exclusively to adult females, and after making all due allowances for individual variations noted by Trägårdh, that one can recognize at least three forms here. One of these, the common brown mite, *B. praetiosa*, is distributed over most of the country and appears to be the only species found east of the Mississippi River. Besides this form there occurs in the west another and in the southwest a third. The differences between these are, in the writer's opinion, of specific

importance, as is indicated in the following key to three forms of *Bryobia*:

- a.¹ Mandibular plate emarginate in front; cephalothoracic plate much broader than long.
- b.¹ Inner tubercles of cephalothoracic plate, as seen in egg-bearing females, united for about half their length, and bearing squamous setae almost as large as those of the outer tubercles *B. praetiosa* Koch.
- b.² Inner tubercles, as seen in adult females, united for at least three-fourths their length, and tipped with squamous setae much smaller than those of the outer tubercles, cephalothoracic plate less than one-third as long as cephalothorax *B. brevicornis*, new species.
- a.² Mandibular plate not emarginate in front; cephalothoracic plate, as seen in egg-bearing females, about as long from base to tips of inner tubercles as it is broad, and fully equal in length to one-half the length of cephalothorax
B. longicornis, new species,

Descriptions of these two new *Bryobias* are here given:

BRYOBIA BREVICORNIS, new species.

Plate 125, fig. 3.

Adults brownish red and similar in markings to *B. praetiosa*. Body about three-fourths as broad as long. Cephalothorax over twice as broad as long; two eyes on each side above second pair of legs, both with cornea; anterior eye about three-fourths the diameter of posterior one. Cephalothoracic plate showing much variation, but always, in the case of egg-bearing females, much broader than long; inner tubercles projecting much in front of lateral ones, united from three-fourths to their entire length, and bearing scales decidedly smaller than those on outer tubercles. Mandibular plate about twice as long as broad and conspicuously notched. Abdomen widest somewhat behind the shoulder region and evenly rounded behind. Front legs equal to the body in length; tarsi provided with two claws (onychial claws), each bearing a pair of tenent hairs, which arise from near the base; and a few hair-like elements, which spring from below the bases of claws. Tarsi of the other legs without tenent hairs and with the hair-like elements below the claws developed into a comb. Length of adult females, 0.69 mm.; width, 0.52 mm.

Type locality.—Tempe, Arizona.

Type slide.—Cat. No. 23756, U.S.N.M.

Described from egg-bearing females on type slide. Three other slides are also in the Museum collection. The specimens were collected by Wildermuth from alfalfa.

BRYOBIA LONGICORNIS, new species.

Plate 125, fig. 4.

In general appearance similar to *praetiosa* and *brevicornis*, but somewhat larger. Cephalothorax over twice as broad as long; two eyes on each side, the larger posterior pair either without cornea, or

with a very thin and indistinct cornea. Cephalothoracic plate very large, and, as seen in egg-bearing females, about as long from base to tips of inner tubercles as broad, and fully equal in length to one-half the length of cephalothorax; inner tubercles but slightly surpassing the outer, separated from the latter by emarginations which extend almost to the base of the plate, and bearing scales considerably smaller than those of the outer tubercles. (There is much variation in the size of these inner tubercles, and the tubercle on one side may be decidedly larger than its fellow on the other side, also the emarginations may entirely separate the outer tubercles from the inner.) Mandibular plate about three-fifths as broad as long and broadest at the base, narrowly rounded in front, and without frontal emargination except in rare instances. Abdomen usually broadest somewhat back of the shoulders and broadly rounded behind. Anterior legs distinctly longer than the body and provided at their tips with the usual armature. The much shorter remaining pairs are also provided with the usual tarsal appendages. Length of egg-bearing females, 0.81 mm.; width, 0.53 mm.

Type locality.—Ashland, Nebraska.

Type slide.—Cat. No. 23767, U.S.N.M.

Described from egg-bearing females on type slide. This species differs from *praetiosa* and *brevicornis* in a number of details, the most important difference being in the great size of the cephalothoracic plate and in its shape. The specimens on the type slide were taken on Dutchman's breeches (*Bikukulla cucullana* (Linnaeus)).

Genus RAPHIGNATHUS Dugès.

In this genus the integument is reticulate. The individuals are stout, with short legs and large tarsal claws. About a dozen species are known, three of which have been described from this country.

RAPHIGNATHUS VIRIDIS, new species.

Plate 125, fig. 5.

Preserved specimens green throughout; body circular in outline. Cephalothorax slightly smaller than abdomen and separated from the latter by an evenly curved groove. Palpi large, surpassing the beak by one-third their length; palpal thumb small but with setae as long as the palpal claw. Abdomen broader than long, with integument reticulate, as it is on the cephalothorax, but not pitted in either case. Dorsal setae straight, simple, and stout, longest on the posterior margin of abdomen, where they extend to the tips of the tarsi of posterior legs. Legs stout; anterior pair considerably longer than the others and extending beyond the tips of palpi by the full length of their tarsi; posterior legs quite short, extending beyond the margin of the body by the full length of their tarsi and one-half the length of the tibiae.

Tarsal claws stout, as in other species of the genus; empodial hairs very fine, a single pair surpassing the tarsal claws. Length, 0.36 mm.; width, 0.26 mm.

Type locality.—Parker, Illinois.

Type slide.—Cat. No. 24028, U.S.N.M.

Described from a single specimen, the type. This species is distinguished at once from the three other described species in having the dorsal setae setiform and not clavate. Specimens were collected in moss by L. M. Smith.

Genus *SYNCALIGUS* Berlese.

This genus, formerly known as *Caligonus*, has recently been divided by Berlese into three. For the two new genera the names, *Homocaligus* and *Caligonella*, have been suggested. The wisdom of making this division may well be questioned, hence the genus name is here used in its former broader sense.

SYNCALIGUS TRIDENTIFER, new species.

Plate 125, fig. 6.

Preserved specimens yellow. A well-armed species. Cephalothorax with four pairs of large, simple, slightly curved setae; a frontal pair, a pair just inside and in front of the eyes, and two pairs behind and lateral to the eyes. The single pair of eyes is situated above second pair of legs, but inward from lateral margins of body. Chelicerae exceedingly sharp and needle-like, but with two chelae each. Palpi stout, each with strongly curved claw at tip. At the base of palpal claw on the inside is a small clawlike chitinous projection of penultimate segment. Palpal thumb cylindrical and not reaching tip of claw; terminal seta or finger ending in three prongs, two being somewhat lateral in position; other setae of thumb conspicuous. Abdomen with nine pairs of dorsal setae arranged as follows: Five pairs forming two longitudinal rows, two pairs on shoulders, one pair above last pair of legs and not far from margin of body, and a lateral, subterminal pair. Legs medium to stout; anterior pair extending beyond the palpi by the full length of their tarsi and a third the length of their tibiae; posterior pair extending beyond the tip of abdomen by over one-half their length. Tarsal claws large and stout, those of leg one about one-half as long as tarsus; empodial hairs fine, two of them slightly exceeding the claws. Length, 0.49 mm.; width, 0.27 mm.

Type locality.—St. Paul, Minnesota.

Type slide.—Cat. No. 24029, U.S.N.M.

Described from a single specimen selected as the type. This species is closely related to *S. mali* (Ewing), a very serious pest on apple trees in Oregon. It is probably a vegetable feeder, although found under a log, where it probably was hibernating, as specimens were taken November 8.

SYNCALIGUS QUERCUS, new species.

Plate 125, fig. 7.

A small, yellowish species. Beak prominent; chelicerae very sharp and needlelike, but each with two arms. Palpi rather short and stout; claw rather strongly hooked toward the distal end; thumb cylindrical, but slightly surpassing the claw and without three cleft distal spine or finger. Abdomen with a few rather long, curved setae. Legs moderate; claws large; empodium with very fine hairs none of which appear to extend beyond the claws. Length, 0.20 mm.; width, 0.12 mm.

Type locality.—Piermont, New York.

Type.—Cat. No. 23778, U.S.N.M.

Two slides are in the United States National Museum collections, both with the same date. This species can be distinguished from *S. mali* (Ewing) and *S. tridentifer*, new species, by the absence of the three-prolonged spine on palpal thumb. It is distinguished from *S. cardinalis* (Ewing) by having the palpal claw almost as long as the thumb, while in *S. cardinalis* the claw is so reduced as to be almost esvtigial. Specimens were taken from leaves of oak by N. Banks (?).

TETRANYCHINA TRITICI, new species.

Plate 125, figs. 8 and 9.

A medium-sized reddish brown, or sometimes greenish, species with long front legs. Cephalothorax very broad and separated from the abdomen by a distinct but not conspicuous groove. Two eyes, or corneas, on each side of cephalothorax, near lateral border; corneas of equal size and situated approximate; ocular pigment deep carmine. Cephalothorax provided above with apparently four pairs of pectinate setae; one pair on the front margin, one just in front of eyes, one pair median to eyes and one pair near the middle of cephalothorax. A pair of tracheal horns is located at the front margin of cephalothorax. They are situated below the front setae and are about one-half as long as the latter. Mouth parts conspicuous; mandibular plate over twice as long as broad and not notched in front; palpal thumb exceeding claw, not swollen, and bearing at its tip several small setae. Abdomen evenly rounded behind, broadest at the shoulders, and sparsely clothed with short, indistinctly pectinate setae. Legs long, particularly the first pair, which is longer than the body; last pair next in length, then third pair, while the second pair is the shortest. Tarsus and tibia of leg 1 about equal; tarsus provided with a long pair of tactile setae near its tip. Tarsal claw single, but provided with a double comb of knobbed hairlike appendages, each comb consisting of about 10 filaments. Tenent hairs as usual. Length (about), 0.5 mm.; width (about), 0.3 mm.

Type locality.—Idaho.

Type slide.—Cat. No. 24030, U.S.N.M.

Described from individuals on type slide. This species is at once separated from our other two species of *Tetranychina*, *T. harti* Ewing (= *T. macdonoughi* McGregor), and *T. apicalis* Banks, and also from *T. superba* (Canestrini), by the absence of seta-bearing tubercles on the back. According to Mr. Wakeland, who sent in the specimens of this species, it causes very serious injury to wheat.

EXPLANATION OF PLATE 125.

(Drawings were made by the writer.)

FIG. 1. *Oligonychus americanus*, new species. End of tarsus IV (camera lucida drawing with oil immersion lens).

FIG. 2. *Oligonychus major*, new species. Tarsal claw (camera lucida drawing with oil immersion lens).

FIG. 3. *Bryobia brevicornis*, new species. Dorsal view of cephalothorax (drawing from egg-bearing female).

FIG. 4. *Bryobia longicornis*, new species. Dorsal view of cephalothorax (drawing from egg-bearing female).

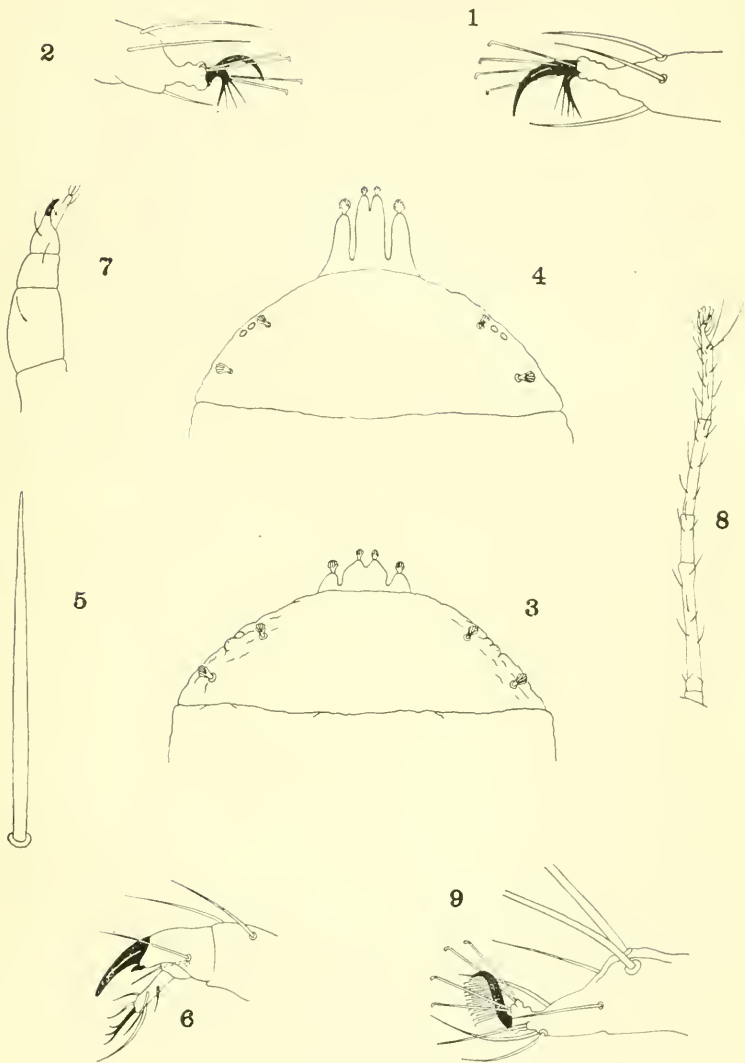
FIG. 5. *Raphignathus viridis*, new species. Seta from dorsum of abdomen.

FIG. 6. *Syncaligus tridentifer*, new species. Last three segments of left palpus from below ($1\frac{1}{2}$ -inch eyepiece and one-sixth ocular used).

FIG. 7. *Syncaligus quercus*, new species. Right palpus from below (drawn with camera).

FIG. 8. *Tetranychina tritici*, new species. Right front leg from above (camera drawing).

FIG. 9. *Tetranychina tritici*, new species. Tip of tarsus of first leg on right side (camera lucida drawing with oil immersion lens).



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FOR EXPLANATION OF PLATE SEE PAGE 666

