

TAXONOMIC AND BIONOMIC NOTES ON SOME
PANAMANIAN CHIGGERS¹
(Acarina, Trombiculinae)

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In a previous paper the author has given an account of the life history of *Eutrombicula batatas* (Linnaeus). The number and general structure of the stages of the species discussed herein are, so far as known the same of those of *E. batatas*.

Eutrombicula helleri (Oudemans)

Microtrombidium helleri Oudemans, 1911, Ent. Ber., 30: 120; Oudemans, 1912, Zool. Jahrb., Suppl. 14 (1): 15; Oudemans, 1927, Tijdschr. v. Ent., 70: 72.
Trombicula helleri, van Thiel, 1930, Parasitology, 22: 351; Ewing, 1931, Proc. U. S. Nat. Mus., 80 (8): 8.
Eutrombicula helleri Ewing, 1938, Jour. Wash. Acad. Sci., 28: 294; Radford, 1942, Parasitology, 34: 66.

This species was originally described from a larva collected on a beetle in Dutch Guiana. There is little doubt that insects are not normal hosts for this species. Oudemans later (1927) recorded specimens from the same area on man, but van Thiel casts doubt on this host record, reporting that a rodent louse was present in the same lot with the mites. Since nothing more is known of this species, its discovery in Panama is of interest. Panamanian larvae agree well with Oudemans' description and figures except that he describes a plumose seta arising from the pedipalpal tibia. This seta is present but actually arises from the tarsus or thumb. The long simple third pedipalpal seta, directed posteriorly, is particularly characteristic.

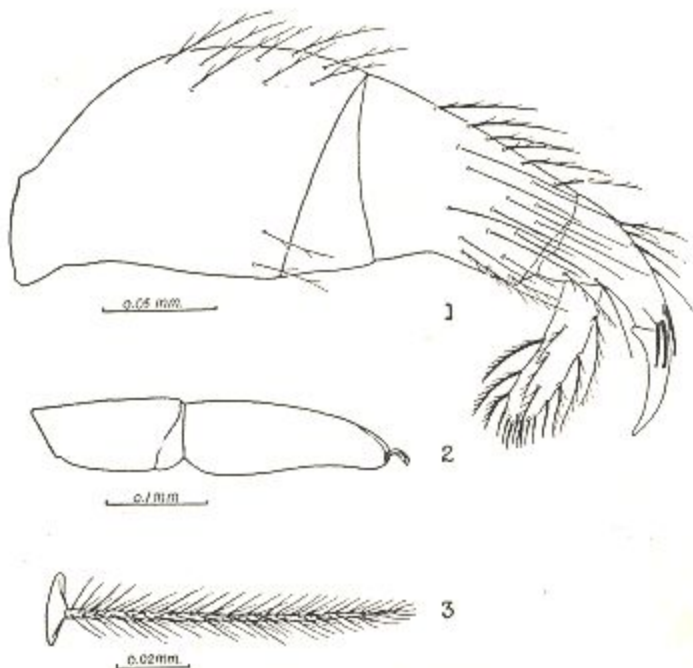
Collecting data for larvae of this species are given below:

Panama Province: Near Panama City; Point Viqué. Colon Province: Santa Rosa; Gatuncillo. Herrera Province: Parita. Canal Zone: Juan Mina; Barro Colorado Island. Dates of collection: January, February, March, July, October. Hosts: Lizard, *Ameiva praesignis* (5); Verreaux's dove, *Leptotila verreauxi* (1); a small flycatcher, *Tyrannidae* (1); domestic chicken, *Gallus gallus* (1); opossum, *Didelphis marsupialis* (1); agouti, *Dasyprocta punctata* (2); rat (unidentified native species) (1); forest rabbit, *Sylvilagus gabbi* (1); ocelot, *Felis pardalis* (1); man (1). Several specimens were also found on shoes. The numbers in parentheses indicate the number of specimens of each host on which larvae were found. This species is usually found in jungle or brush covered areas, not in open grassy places where *E. batatas* is often abundant.

Adult (female): Red. Length 1.3 mm. Body behind constriction much swollen. *Pedipalps* robust, with relatively few hairs, although

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more than in *E. batatas* or *vanommerani* (fig. 1), most of the hairs on inner surface of patella simple; tibia with three (or four on one side) blunt spines arising from a small elevation on inner side of segment near base of claw; claw with a rounded swelling at base of concave margin, as in *E. batatas*; dorsal margin of claw (measured in a straight line) 0.61 times length of tibia; finger with seven or eight short simple setae at apex, other setae strongly plumose; apex of finger slightly exceeding apex of claw. *Crista* slender, measured together with pseudostigmatic area, 0.19 mm. long; crista expands posteriorly rather abruptly into broad pseudostigmatic area (0.047 mm. wide measured to lateral margins of pseudostigmata) which is truncate posteriorly. *Eyes* represented by



1. Pedipalp of adult *Eutrombicula helleri*. 2. Last two segments of foreleg of same. 3. Hair from posterior portion of body of same.

small convexities postero-lateral to pseudostigmatic area. *Genitalia* with neck of sacculi of female conspicuous. *Body hairs* slender, nearly twice as long at posterior part of body as on shoulders, plumose throughout, distal setulae slightly shorter than basal; longest body hairs 0.11 mm. long. *Legs* much shorter than body, total length of foreleg about 0.9 mm. Last segment of foreleg thickest near base, 1.25 times as long as next to last segment and not thicker than that segment, 2.8 times as long as broad.

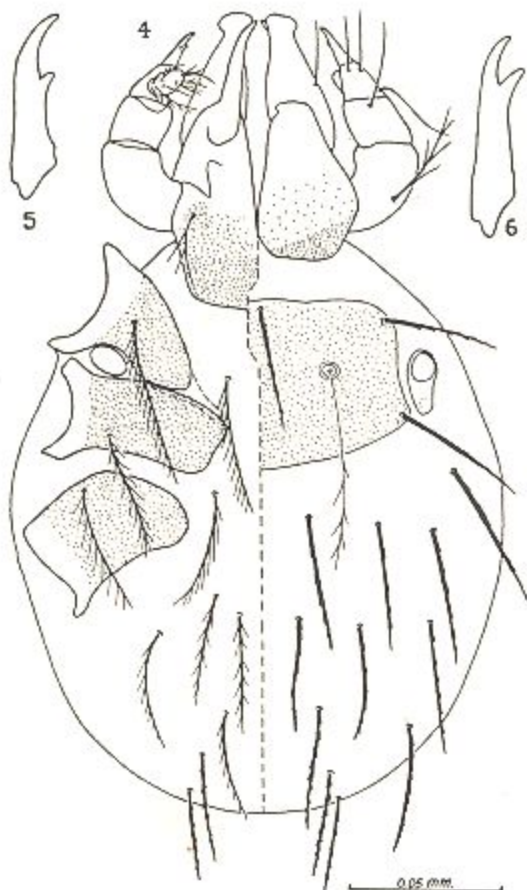
The single adult studied was found in leaf mold under trees at Santa Rosa, Colon Province, Panama, September 10, 1945 (C. D. Michener). It was placed in a jar of sterile earth and about two weeks later fifteen larvae, one of which is shown in figure 4, emerged.

This is the largest of the known adults of *Eutrombicula*.

Eutrombicula vanommereni (Schierbeek)

Trombicula vanommereni Schierbeek, 1937, Ann. Parasit. Hum. Comp., 15: 326; Schierbeek, 1938, Acta Leidensia, 12-13: 266; Radford, 1942, Parasitology, 34: 60.

This species was originally described from larvae from lizards collected in Dutch Guiana. A form which appears to be the same is common on lizards in Panama. Our specimens agree with the original



4. Larva of *Eutrombicula helleri* reared from adult illustrated in figures 1 to 3. 5. Pedipalpal claw of same. 6. Pedipalpal claw of larval *Eutrombicula vanommereni*.

description and differ from the accompanying figures chiefly in the less conspicuous posterior eyes. Except for the plumose third pedipalpal seta and the shape of the pedipalpal claw (fig. 6), *E. vanommereni* larvae agree with the figure of *E. helleri* (fig. 4).

This species is related to *E. alfreddugèsi* (Oudemans) from which the larva differs by having the second pedipalpal seta simple. It is also

close to *E. tropica* (Ewing). According to Dr. G. W. Wharton, who kindly examined the type of *E. tropica* for me, the second pedipalpal seta of that species is simple as in *E. vanommereni*, but the third is also simple, unlike the latter species. In this respect *E. tropica* is similar to *E. göldii* (Oudemans). Although these species are distinguished by only minute differences, the characters are constant in a large series of specimens from Panama. Apparently there are also differences between the adults of *E. alfreddugèsi*, *vanommereni* and *göldii*.

Collection data for larvae of *E. vanommereni* are given below:

Panama Province: Matías Hernández; Las Guacas. Colon Province: Santa Rosa; Agua Clara; three-fourths mile south of Río Limón; Gatuncillo. Darien Province: El Real. Canal Zone: Juan Mina. Dates of collection: December, January, February, March, June. Hosts: lizard, *Ameiva praesignis* (14); snake, *Drymarchon corais* (1); domestic chicken, *Gallus gallus* (1); Lafresnaye's sparrow, *Arremonops conirostris* (1); peccary, *Pecary angulatus* (1); white tailed deer, *Odocoileus chiriquensis* (1); domestic goat (1); spotted agouti, *Dasyprocta punctata* (1); capybara, *Hydrochoerus isthmus* (1); rat (unidentified native species) (2); forest rabbit, *Sylvilagus gabbi* (1). Specimens were taken on boots on many occasions.

The numbers in parentheses indicate the number of specimens of each host on which larvae were found. This species is often found in open grassy places in company with *E. batatas*. It also occurs in bushy areas.

On lizards (*Ameiva praesignis*) larvae sometimes remain attached for over three weeks before dropping, and do not detach on the death of the host. On the other hand, larvae on a snake (*Drymarchon corais*) detached soon after the death of the host.

Protonymph: Apparently not distinguishable from that of *E. batatas*.

Nymph: Pale red. Length about 0.5 mm. Similar to adult except for usual nymphal characters. Finger of pedipalp not parallel sided but slightly thickened basad of middle, bearing four or five short simple setae at apex. Longest hairs of shoulders about half as long as those of posterior end of body. Last segment of foreleg 1.39 to 1.53 times as long as next to last segment, 1.7 to 2.2 times as long as broad.

Preadult: Unknown.

Adult: Red. Length 0.9 to 1.1 mm. Body shape about as in *E. batatas*, that portion of body behind constriction not unusually swollen. *Pedipalp* with few hairs, as in *E. batatas*, most of those of inner margin of patella simple; inner surface of tibia with the usual three blunt spines arising from subapical protuberances and a single sharply pointed spine arising at about middle of upper margin; claw with rather sharp swelling at base of concave margin, as in *E. batatas*, dorsal margin of claw (measured in straight line, not around curve of claw) 0.61 to 0.62 times length of tibia; finger with seven or eight short simple setae at apex, other setae strongly plumose; finger shaped as in *E. helleri*, slightly exceeding claw. *Crista* slender, measured together with pseudostigmatic area 0.15 to 0.17 mm. long; crista expands posteriorly rather abruptly into broad pseudostigmatic area (0.059 to 0.075 mm. wide measured to lateral margins of pseudostigmata) which is truncate

posteriorly in some views, bilobated, the lobes separated by width of a lobe, in others; pseudostigmatic area with a transverse arcuate ridge anterior to pseudostigmata, as figured for *E. batatas*. Pseudostigmatic organs about as long as crista, with a few branches as in *E. batatas*. Eyes less conspicuous than in *E. batatas*, larger than in *E. helleri*, about half as wide as width of pseudostigmatic area. Genitalia with necks of sacculi of female conspicuous. Body hairs shaped about as figured for *E. batatas*, with long setulae throughout their lengths, longest hairs of shoulders about two-thirds as long as those of posterior end of body; longest body hairs 0.045 to 0.047 mm. long. Legs shorter than body, total length of foreleg about 0.73 mm.; forelegs longer and thicker than other legs, last segment thickest near base, not so slender apically as figured for *E. helleri*, 1.36 to 1.41 times as long as next to last segment and not thicker than that segment, 2.1 to 2.6 times as long as broad.

Nymphs and adults have not been collected in the field but have been reared from larvae on lizards (*Ameiva praesignis*), using the methods described elsewhere for *E. batatas*. The duration of the free living stages is apparently not greatly different from that of *E. batatas*, as shown by the following: larvae dropped from host November 22, nymphs observed December 2 and adults December 24.

Eutrombicula batatas (Linnaeus)

This species was the subject of a previous paper (Michener, 1946, Ann. Ent. Soc. Amer., 39: 101-118). The following synonymy completes that given there:

- Trombidium batatas* Oudemans, 1937, Kritisch Hist. Overzicht der Acarologie, Band D, p. 1384.
Eutrombicula batatas Michener, 1946, Ann. Rep. Gorgas Mem. Lab., 1945: 23; Michener, 1946, Ann. Ent. Soc. Amer., 39: 101; Michener, 1946, Amer. Jour. Trop. Med., 26: 251.
Acariscus flui and *hominis* Ewing, 1946, Proc. Biol. Soc. Wash., 59: 22.

With regard to the discussion of the plumosity of the third palpal seta of the larva, it should be noted that Schierbeek (1937, Ann. Parasit. Hum. Comp., 15: 326) states on the authority of van Thiel that this seta is plumose and was overlooked in the original description of *Trombicula flui* van Thiel. Islas (1943, An. Inst. Biol. Univ. Nac. Mexico, 14: 441) shows this seta as plumose in his figure of a Mexican specimen.

This mite has been collected at or near Santa Rosa, Colon Province, Panama, on several additional hosts² since the writing of the previous paper dealing with this species. These hosts are listed as follows: Cayenne wood rail, *Aramides cajanea* (1); little blue heron, *Florida caerulea* (5); Panama house wren, *Troglodytes musculus* (1); short-legged wood pewee, *Myiochanes cinereus* (1); Berlepsch's kingbird, *Tryannus melancholicus* (1); forest rabbit, *Sylvilagus gabbi* (1); domestic cattle (2). The numbers in parentheses indicate the number of specimens of each host on which larvae were found. Most of these hosts appear to be of

²Dr. Jorge Boshell Manrique writes that the "gallineta," mentioned as a host (of *pastorae*) by Boshell and Kerr, is the guinea hen (*Numida meleagris*), also recorded as a host by Ewing.

minor importance, only a few mites having been found on each. However, the little blue heron is important, some of the individuals examined having had nearly one thousand chiggers on them. This may be of importance in connection with an understanding of the survival of the species during the dry season. On the Pacific side of Panama *E. batatas* disappears during the dry season from most grassy areas around houses, where its main host is the domestic chicken. It was thought that

TABLE I
CHARACTERS OF ADULTS OF PANAMANIAN EUTROMBICULAS
(All measurements are in microns except as otherwise indicated.)

	<i>batatas</i>	<i>vanommereni</i>	<i>helleri</i>
Length (mm.)	0.7-1.0	0.9-1.1	1.3
Body shape	normal		swollen posteriorly
Length of pedipalpal claw	32-38	38-42	46
Dorsal margin of pedipalpal claw	0.60-0.66	0.61-0.62	0.61
Length of pedipalpal tibia			
Number of short simple setae at apex of palpal finger	3-4	7-8	7-8
Length of crista and pseudostigmatic area	120-150	150-170	190
Breadth of pseudostigmatic area	47-57	59-75	47
Diameter of eye	0.75-1.0	0.5	0.4
Width of pseudostigmatic area			
Length of longest shoulder hairs	0.7-0.8	0.6-0.7	0.5
Length of hairs at posterior end of body			
Length of last segment of foreleg	1.41-1.49	1.36-1.41	1.25
Length of next to last segment of foreleg			
Length of longest hairs of posterior end of body	36-40	45-47	110

perhaps the species survived in deep cracks in the soil, but this was not substantiated by digging. It now seems probable that it passes the dry season in damp grassy areas along streams frequented by herons and other birds, and is reestablished each wet season in the higher areas away from streams by movements of infested birds.

The number of eggs laid by individuals of this species is unknown. However, twenty-six larvae appeared in eighteen days in a jar of sterilized soil in which a single female of *E. batatas* was kept.

In connection with rearing methods, it should be noted that a far better method of feeding nymphs and adults than that used by me has been devised by Lt. Dale Jenkins. Following G. W. Wharton, he used insect eggs as food, and it seems probable that this is the normal food for nymphal and adult chiggers. However, a small number of individuals were reared by me in the absence of insect eggs when chicken manure was present in the rearing jars.

The characters useful for distinguishing the adults of the three Panamanian species of *Eutrombicula* known in that stage are indicated in Table I. Certain other characters which have been useful for other trombiculines are included in this table, even though of little value for the separation of the Panamanian species.

Trombicula panamensis Ewing

- Trombicula panamensis* Ewing, 1925, Amer. Jour. Trop. Med., 5: 259; Ewing, 1931, Proc. U. S. Nat. Mus., 8(8): 9.
Eutrombicula panamensis Ewing, 1938, Jour. Wash. Acad. Sci., 28: 294; Radford, 1942, Parasit., 34: 66.
Acariscus panamensis Ewing, 1943, Proc. Ent. Soc. Wash., 45: 59.

Larvae were found on two rats (unidentified native species) from Gatuncillo, Colon Province, Panama, collected by H. Trapido on March 5, 1945.

Most of the specimens have two subequal accessory prongs on the pedipalpal claws so that the species falls in *Trombicula*, not *Eutrombicula*. Ewing indicated that proper generic assignment was doubtful when he included the species in *Acariscus*.

Apparently there is complete intergradation, through various stages in the reduction of one of the accessory prongs of the claw, between typical *Trombicula* with three prongs in the palpal claws and the group of *Eutrombicula* in which there is a single outer prong shorter than the principal one. It is therefore believed that this group of *Eutrombicula* (including such species as *bruyanti* (Oudemans) and *panamensis* Ewing) should be transferred to *Trombicula*. The typical *Eutrombiculas* lack outer prongs on the pedipalpal claws but have a subapical or median tooth on the inner side.

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