

FOUR NEW PERUVIAN CHIGGERS  
(ACARINA-TROMBICULIDÆ)<sup>1</sup>

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The specimens on which this paper is based were collected by O. P. Pearson and were obtained through Charles Remington from Harvard's Museum of Comparative Zoölogy. Their courtesy in transmitting the specimens is greatly appreciated. The records of the hosts from which these chiggers were removed were provided by O. P. Pearson.

Six species of chiggers have previously been reported from Peru: *Crotiscus thomasi* (Oudemans, 1910);<sup>2</sup> *Megatrombicula peruviana* (Ewing, 1929); *Odontacarus australis* Ewing, 1929; *Trombicula shannoni* Ewing, 1929; *Trombicula japa* Ribeyro and Bambaren, 1922; and *Eutrombicula alfreddugèsi tropica* (Ewing, 1928). The present paper increases the list to ten. Of the six species previously reported *Megatrombicula peruviana* is known only as an adult while *Trombicula japa* cannot be identified on the basis of available information and will probably have to become a species *incertæ sedis*.

While preparing this paper particular attention has been given to the modified setæ of the legs. Wharton 1947 and 1947a has shown that the chaetotaxy of the legs is an important aid to the taxonomic study of larval trombiculids. As more and more species are studied, it becomes increasingly obvious that it is desirable to name these setæ. Grandjean 1935 worked out a system of nomenclature for the modified setæ on the last three segments of the legs of oribatid mites. However, his system applied to all instars and so cannot be readily modified to fit the present case. Nesbitt 1945 has named the setæ

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<sup>2</sup> New combination based on unpublished work by H. S. Fuller.

on the tarsi of acarid mites and has thus been able to simplify their description.

In the trombiculid mites four types of modified setæ are found on the legs and palps as follows:

1. Blunt striated sensory setæ—one on the dorsal side of each tarsus of the first two pairs of legs and one at the base of the palpal tarsus on the ventral surface.
2. Pointed striated sensory setæ—on the genua and tibiæ of all leg, the tarsus of leg I, and the pretarsi of legs I and II. There may be on one tarsus III and the palpal tarsus, but this is unusual.
3. Microsensory setæ—may be present on the genua, tibiæ, and tarsi of legs I and II.
4. Whip-like setæ—one or more may be present on telofemur, genu, tibia, and tarsus of leg III.

Unfortunately these setæ are not all constant in their positions on the legs but may vary from species to species. It is therefore impossible to name them on the basis of location. One solution to the problem is to name the fixed setæ while reserving fluid terms for the others. The following system is suggested.

spur = blunt striated sensory seta on the tarsus. (The use of the term spur for this seta is adopted from Brennan 1947, Ewing in many papers has referred to this seta as the dorsal spine, but since it is usually rounded at its tip, Brennan's term is to be preferred.)

pretarsala = the striated sensory seta on the pretarsus.

subterminala = the pointed striated sensory seta on the dorsal prominence of tarsus I.  
(The term subterminal is taken from Ewing 1931.)

parasubterminala = a microsensory seta associated with the subterminal seta.

microspur = a microsensory seta close to the spur or situated between the spur and the subterminal seta.

tibiala = a pointed striated sensory seta on the tibia.

microtibiala = a microsensory seta on the tibia.

genuala = a pointed striated sensory seta on the genu.

microgenuala = a microsensory seta on the genu.

mastitarsala = a whip-like seta on the tarsus.

mastitibiala = a whip-like seta on the tibia.

mastigenuala = a whip-like seta on the genu.

mastifemorala = a whip-like seta on the femur.

By combing the names of the setæ as given above with the appropriate Roman numeral to indicate the leg on

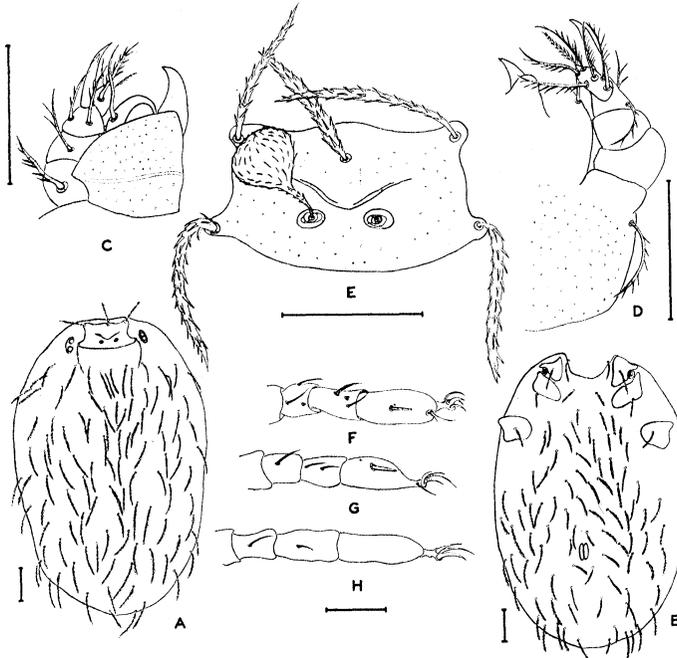


Fig. 1. *Euschöngastia phylloti* n. sp. A, dorsum; B, venter; C, dorsal view of gnathosoma; D, ventral view of gnathosoma; E, scutum; F, leg I with specialized setæ of genu, tibia, tarsus, and pretarsus; G, similar view of leg II; H, similar view of leg III. (Magnification of each figure, indicated by the line associated with the figure, represents 50 microns.)

which the seta or setæ are found the statement, "three whip-like setæ on tarsus III" can be reduced to "three mastitarsalæ III", or the statement, "a blunt striated sensory seta on tarsus I" can be reduced to "spur I." A second and perhaps more important reason for naming

the modified setæ on the legs is that it will call attention to their presence and importance in the descriptions of trombiculid larvæ. A nameless structure is more likely to be ignored than one for which a name is available.

The above system of nomenclature will be adopted in describing the four species included in this paper. Special drawings of the legs (Figure I) have been made so that the modified setæ can be shown in detail.

*Euschöngastia phylloti* n. sp.

*Body*: Oval in shape, 560 microns long and 360 wide, striæ over entire surface. A pair of subequal eyes with well developed corneas on each side of the body at the level of the posterior lateral scutal setæ. Eyes about 15 microns in diameter. Anal opening ventral.

*Gnathosoma*: Chelicerae stout, basal segments with angular lateral expansions, distal segment with a hyaline tip that bears a dorsal tooth, a minute ventral tooth, and a pointed apex. Palpal segment 1 with a feathered seta; 2 with a feathered seta; 3 with a seta that is nude or branched; 4 with a dorsal and ventral setæ feathered and lateral seta nude or branched, palpal claw with two small dorso-lateral tines and one large median tine; 5 with a spur, 5 ventral feathered setæ, and one dorsal feathered seta. Galeal seta nude. No stigmata or tracheæ present.

*Legs*: Coxæ I and II contiguous, coxa III about its own length posterior to coxa II. All coxæ with a single seta except the right coxa of specimen #540-2 which has two setæ. Sensory setæ on legs as follows:

I—2 genualæ, 1 microgenuala, 2 tibialæ, 1 microtibiala, 1 spur, 1 microspur lateral to the spur, 1 subterminala, 1 parasubterminala, and 1 pretarsala.

II—1 genuala, 2 tibialæ, 1 spur, 1 microspur posterior to the spur, and 1 pretarsala.

III—1 genuala and 1 tibiala.

Each leg terminates in a pair of tarsal claws that are lateral to a medium longer and thinner claw-like empodium.

*Scutum*: Roughly rectangular with punctate ornamentation. A definite V-shaped ridge anterior to the pseudostigmata. Posterior lateral setæ on lateral projections of the scutum. Scutal setæ stout and feathered. Sensillæ globose with fine setules over entire surface except on basal portion of stem. The Standard Data (Wharton 1946) follow:

Specimen	AW	PW	SB	ASB	PSB	AP	AM	AL	PL	S
540-1	79	105	20	30	21	43	55	69	75	32
621-6	69	99	19	31	23	35	55	62	62	23
621-8 Type	76	90	21	28	18	32	50	62	54	37
621-9	66	88	20	27	14	27	46	62	62	27
621-10	69	88	18	29	20	29	44	60	62	.....
Mean	72	94	19	29	19	33	50	63	63	30

*Setæ*: Dorsal setæ feathered about 55 microns long and arranged in indistinct rows, about 100 setæ in all. Humeral setæ not distinctly set off from other dorsal setæ. Sternal setæ feathered, 2 pairs between coxæ I and II, about 40 microns long. Approximately 60 ventral setæ arranged in indistinct rows from between coxæ III to the posterior end, feathered, and about 50 microns long.

*Material*: The following specimens all collected by O. P. Pearson at Caccachara, 50 miles S. W. of Ilave, Peru were studied:

O. P. Pearson's #	Host	Date	Number of Specimens
540	<i>Phyllotis darwini</i>	5 October 1946	2
547	<i>Chinchillula sahamæ</i>	7 October 1946	1
621	<i>Phyllotis darwini</i>	22 October 1946	13 + Type (MCZ No. 3026)

*Diagnosis*: *Euschöngastia phylloti* can be readily recognized in that it differs from other members of the genus as here interpreted in having the ventral setæ extend anteriorly between coxæ III.

*Remarks*: Ewing restricted the genus *Euschöngastia* to species with more than three prongs on the palpal claw, and erected the genus *Ascoshöngastia* to include similar specimens with two or three prongs on the palpal claw. The type species of *Ascoshöngastia* however has only

three setæ on the scutum instead of five. It seems more desirable at present to expand the meaning of *Euschön-gastia* to include *E. phylloti* than to erect a new genus or to accept Ewing's interpretation of *Ascoshöngastia*.

***Trombicula pearsoni* n. sp.**

Figure 2

*Body*: Oval, 350 microns long by 250 microns wide, striæ fine anteriorly coarser posteriorly, eyes opposite posterior lateral setæ, anterior eyes larger 18 microns, posterior eyes 15 microns, both eyes on an indistinct ocular plate, anus ventral more than its own length from the posterior end in a partially engorged specimen.

*Gnathosoma*: Chelicerae with rounded basal segments that are longer than the narrow dorsally curved distal segments. Each distal segment with a tricuspid cap, one tooth dorsal, one ventral, and one apical. Palpal segments evenly rounded laterally; segment 1 with a feathered seta; 2 with a feathered seta; 3 with a feathered seta with fewer barbs than seta on 2; 4 with a nude dorsal seta, a branched lateral seta, and a feathered ventral seta. Palpal claw with two small outer prongs and a large median prong. Palpal segment 5 with a basal spur and seven feathered setæ. Galeal seta nude or with one or two barbs. No stigmata or tracheæ present.

*Legs*: Coxæ in partially engorged specimens nearly contiguous. Each coxa with a single feathered seta. Sensory setæ on legs as follows:

I—a microgenuala between a pair of genulæ, a microtibiala lateral to the posterior of two tibialæ, a microspur anterior to the spur, a subterminala and parasubterminala that arise from a single base, and a pretarsala.

II—one genuala, 2 tibialæ, a microspur posterior to the spur, and pretarsala.

III—one genuala and one tibiala.

Each leg is terminated by a pair of curved claws that arise on the lateral tip of the pretarsus. A thin claw-like empodium is present between the claws.

*Scutum*: The scutum is roughly pentagonal, and is

completely covered by small, numerous, punctæ. The pseudostigmata are small and each has a short slit in front of it about equal to its diameter. Sensillæ are long filiform and have a few barbs on the distal two-fifths.

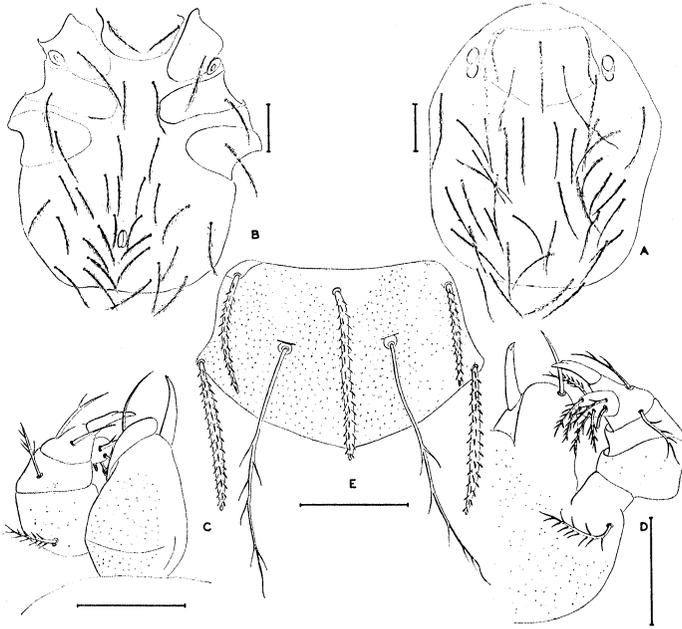


Fig. 2. *Trombicula pearsoni* n. sp. A, dorsum; B, venter; C, dorsal view of gnathosoma; D, ventral view of gnathosoma; E, scutum. (Magnification of each figure, indicated by the line associated with the figure, represents 50 microns.)

The scutal setæ are covered with short barbs. The Standard Data follow:

Specimen	AW	PW	SB	ASB	PSB	AP	AM	AL	PL	S
Type	86	118	47	52	40	54	72	51	66	97
456-1	94	117	46	41	46	48	63	48	69	.....
456-2	90	114	50	39	43	41	72	60	69	93
Mean	90	116	48	44	43	48	69	53	68	95

*Setæ*: The dorsal setæ are similar to the scutal setæ. They are about 85 microns long and are distributed in transverse rows from anterior to posterior as indicated

below. The anterior ventral setæ, including the sternal setæ, differ from the dorsal setæ in that their barbs are slightly longer and arise from only two lines along the shaft rather than all over the shaft. The arrangement in indefinite rows is given below.

Specimen	Dorsal setæ	Ventral setæ	Total
Type	2-8-5-8-4-6-4 + 9	2-2 + 16	66
456-2	2-6-2-8-7-7-4 + 14	2-2 + 16	70
456-1	2-8-6-8-6-8 + 18	2-2 + 18	78

*Material:* These specimens were collected by O. P. Pearson at Caccachara, 50 miles S.W. of Ilave, Peru, at an elevation of 16,000 feet.

O. P. Pearson's #	Host	Date	Number of Specimens
456	<i>Punomys lemminus</i>	13 September 1946	2 + Type (MCZ No. 3027)

*Diagnosis:* *Trombicula pearsoni* can be distinguished from other members of the genus because while it has a pentagonal scutum it lacks whip-like setæ on the third legs. In these characteristics it is similar to *Trombicula biops* n. sp. but can be distinguished from it most readily on the basis of the feathered dorsal seta on the palpal tibia in *T. biops*, as opposed to the nude seta found in this position in *T. pearsoni*.

*Remarks:* This species is named for the collector O. P. Pearson.

### *Trombicula biops* n. sp.

#### Figure 3

*Body:* Elongated 462 microns by 200 microns, striæ well developed, eyes two on either side at the level of the posterior lateral setæ. No ocular plate present. Diameter of anterior eye 10 microns, posterior eye 8 microns. Anus about twice its length from the posterior end on the ventral side.

*Gnathosoma:* Basal segments of chelicerae weakly angular laterally, distal segments short with tricuspoid cap. Palpal segment 1 with a feathered seta; 2 with a feathered seta; 3 with a feathered seta; 4 with two branched setæ and a ventral feathered seta, palpal claw with two small subequal dorso-lateral prongs and a stout longer median

prong; segment 5 with one spur, 2 basal and 3 apical feathered setæ, and a large feathered dorsal seta. Galeal seta nude. No stigmata or tracheæ present.

*Legs:* Coxæ I and II contiguous, III separated by its own width from II. All coxæ with a single feathered seta. Leg I with a pair of genualæ with a microgenuala between

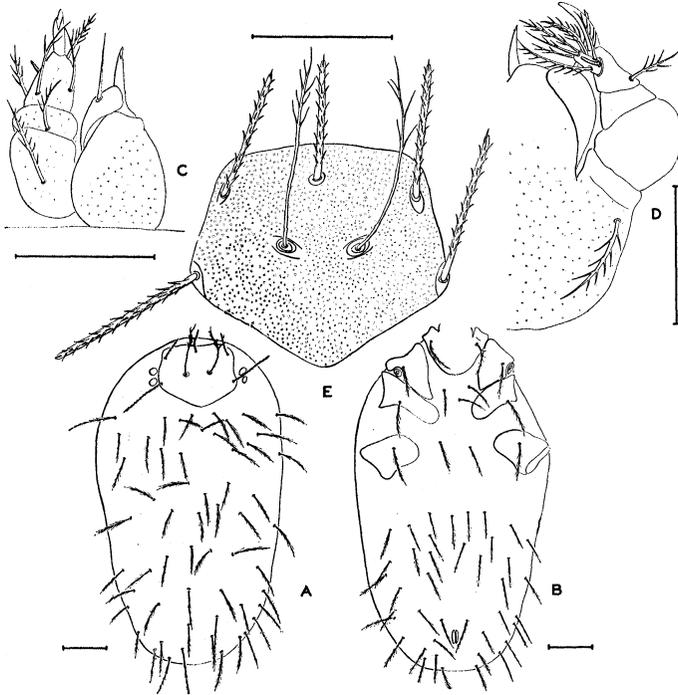


Fig. 3. *Trombicula biops* n. sp. A, dorsum; B, venter; C, dorsal view of gnathosoma; D, ventral view of gnathosoma; E, scutum. (Magnification of each figure, indicated by the line associated with the figure, represents 50 microns.)

them; two tibialæ in tandem with a microtibiala between them; a spur with a microspur half the length of the spur anterior to the base of the spur; subterminala with small parasubterminala arising from an independent setal base; one pretarsala. Leg II with one genuala, two tibialæ, a spur and microspur, and pretarsala. Leg III with a

genuala, a tibiala, but no whip-like setæ. Each leg is terminated by a pair of lateral ambulacral claws that flank a median longer and thinner claw-like empodium.

*Scutum*: The scutum is definitely pentagonal in shape. It is ornamented by closely set, irregularly placed punctæ. The pseudostigmata are small and bordered by short anterior and posterior ridges. The sensillæ are peculiar in that they have extremely short fine barbs along their entire length. The scutal setæ are provided with short barbs over their entire surface. The Standard Data follow:

Specimen	AW	PW	SB	ASB	PSB	AP	AM	AL	PL	S
Type	70	86	28	35	41	30	48	40	59	72
508-1	69	90	25	35	39	29	46	44	62	83
508-2	70	89	28	35	36	26	41	39	57	75
508-4	72	91	26	35	36	31	48	35	58	76
540-2	67	79	26	28	29	25	35	29	47	....
Mean	70	87	27	34	36	28	44	37	57	77

*Setæ*: Dorsal and ventral setæ similar to scutal setæ about 40 to 50 microns long. Dorsal setæ irregularly arranged. A pair of humeral setæ present followed by an irregular band of about 16 setæ, behind these anterior dorsal setæ there are about 40 posterior dorsal setæ. The ventral setæ are arranged in more definite rows than the dorsal setæ but they are also too irregular to permit a setal formula. Two pairs of sternal setæ in all eight specimens examined but the type is unusual in that it bears an extra median seta between the first pair of sternal setæ. Posterior to the last pair of coxæ there are about 40 setæ arranged in irregular rows.

*Material*: Collected by O. P. Pearson at Caccachara, 50 miles S.W. of Ilave, Peru, at an altitude of 16,000 feet.

O. P. Pearson's #	Host	Date	Number of Specimens
	<i>Phyllotis</i>	28 September	5
508	<i>boliviensis</i>	1946	
540	<i>Phyllotis</i>	5 October	2 + Type
	<i>darwini</i>	1946	(MCZ No. 3029)

*Diagnosis*: As mentioned under the discussion of *Trombicula pearsoni*, *T. biops* is morphologically similar to it. *T. biops* can be separated from *T. pearsoni* on the shape

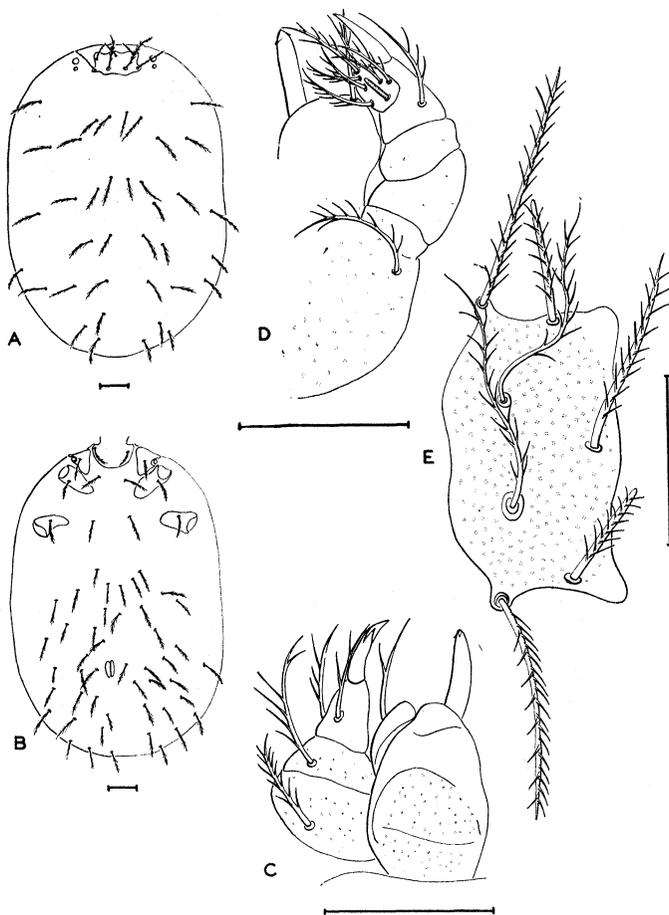


Fig. 4. *Trombicula chara* n. sp. A, dorsum; B, venter; C, dorsal view of gnathosoma; D, ventral view of gnathosoma; E, scutum. (Magnification of each figure, indicated by the line associated with the figure, represents 50 microns.)

of the scutum, absence of ocular plates, size of the subterminalæ, and arrangement of the body setæ as well as by the difference noted under the discussion of *T. pearsoni*.

*Remarks:* The sensory setæ and sensillæ of this species are so different from those of other species that have been studied in this respect, that it is difficult to know just how *T. biops* is related to other species.

***Trombicula chara* n. sp.**

Figure 4

*Body:* An elongated regular oval 625 microns long by 400 microns wide. Striæ weak. Eyes distinctly separate; anterior eyes 8 microns in diameter, posterior eyes 6 microns. Anus ventral and relatively far anterior, 170 microns from the posterior end.

*Gnathosoma:* Chelicerae with rounded basal segments, and short strongly curved distal segments each of which terminates in a typical tricuspid cap. Palpal segments 1 and 2 with feathered setæ; segment 3 with a branched seta; the three setæ on segment 4 branched, palpal claw with two subequal dorso-lateral tines and a longer median ventral prong; segment 5 with a basal spur and seven feathered setæ, one dorsal, two apical, and four ventral. Galeal seta branched. No stigmata or tracheae present.

*Legs:* Coxæ I and II contiguous, coxa III separated by its own length from coxa II. All coxæ with a single feathered seta. Leg I with three genualæ, one microgenuala, two tibialæ, one microtibiala, one spur, one microspur at the tip of the spur, one subterminala and one parasubterminala arising from the same base, and one pretarsala. Leg II with one genuala, two tibialæ, one spur, and a pretarsala. Leg III with one genuala, one tibiala, and one mastitarsala. All legs terminate in a pair of claws and a median claw-like empodium.

*Scutum:* Irregularly shaped with a sinuous posterior margin. Punctæ scattered over entire scutum except on anterior lateral angles. Pseudostigmata simple pits. Sensillæ filiform with many branches extending almost to their base. Scutal setæ with numerous barbs that arise from one face. Anterior lateral setæ set back from the anterior lateral margins of the scutum. The Standard Data follow:

Specimen	AW	PW	SB	ASB	PSB	AP	AM	AL	PL	S
Type	72	83	28	32	17	20	55	35	69	76
508-1	72	79	30	28	15	21	54	36	70	76
540-1	76	87	30	30	18	21	55	33	72	71
540-6	72	87	30	28	18	19	41	35	62	.....
540-9	75	83	30	30	18	19	55	32	69	72
Mean	73	84	30	30	17	20	52	34	68	74

*Setæ*: The dorsal and ventral setæ are similar to the scutal setæ. The dorsal setæ are about 60 microns long while the ventral setæ are about 50 microns. The dorsal setæ are arranged in fairly regular rows. The type has a dorsal setal formula as follows: 2-8-9-6-6-4-2. The other specimens have a less regular arrangement that begins 2-10. The ventral setæ consist of two pairs of sternals and about fifty setæ posterior to coxæ III.

*Material*: All specimens were collected by O. P. Pearson at Caccachara, 50 miles S.W. of Ilave, Peru, at 16,000 feet.

O. P. Pearson's #	Host	Date	Number of Specimens
508	<i>Phyllotis boliviensis</i>	28 September 1946	4
540	<i>Phyllotis darwini</i>	5 October 1946	11 + Type (MCZ No. 3028)

*Diagnosis*: *Trombicula chara* can be readily recognized from previously described species of *Trombicula* in that it lacks a pentagonal scutum but does have a mastitarsala on leg III.

*Remarks*: The types of *T. chara* and the other new species described, as well as half of the other specimens, will be returned to the Museum of Comparative Zoölogy at Harvard. One specimen of *Euschöngastia phylloti*, *Trombicula biops*, and *Trombicula chara* will be sent to the U. S. National Museum; a similar series will be deposited at the U. S. Public Health Laboratory in Hamilton, Montana; one specimen of *Euschöngastia phylloti* and one of *Trombicula chara* will be sent to the South Australian Museum; and the remainder will be retained at Duke University.

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