

LORILLATUM, A NEW SUBGENUS OF LEPTOTROMBIDIUM,
WITH DESCRIPTION OF A NEW SPECIES
(Acarina: Trombiculidae)¹

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Abstract: A new subgenus, *Lorillatum*, is raised within *Leptotrombidium* s. l. to accommodate a new species from Laos, *mastigophorum*, and two species originally described in *Trombicula* from Borneo—*flagelliferum* Traub and Audy, and *tuhana* Traub and Audy. Description and figures of the new species, summary descriptions of *flagelliferum* and *tuhana* (with new host records), and a table of comparative standard measurement is given.

Trombicula flagellifera and *T. tuhana* were described from insectivores and rodents from British North Borneo by Traub and Audy (1954). Both species share many morphological characters, the most significant being the presence of outstanding whip-like setae, often basally barbed, on telofemora, genua, tibiae and (sometimes) tarsi III. However, with the exception of the dorsotibial palpal seta, which is nude, both species appear more closely related to the SE Asian species of the typical subgenus of the genus *Leptotrombidium* (Ver-cammen-Grandjean, 1960). A re-examination of remounted specimens of both species shows the palpal tarsus of *flagellifera* and *tuhana* to bear seven barbed setae and a subterminala (not 5BS as described, or 6B as figured in *flagellifera*, or 5BS as figured in *tuhana*). Because of these differences, particularly in leg III, a new subgenus *Lorillatum* is described within *Leptotrombidium* s. l. to receive these two species, together with a third new species from Laos.² Audy (1961) placed *flagellifera* and *tuhana* among the ungrouped species. A table of comparative measurements is given at the end of the paper.

Lorillatum Nadchatram, n. subgen.

Trombicula, flagellifera-group Audy, 1954.

Type species: *Trombicula flagellifera* Traub and Audy, 1954.

Diagnosis of subgenus: trombiculine larvae with rectangular scuta, and filliform sen-

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2. Audy (1954, p. 124) discusses three different ways in which genera and subgenera have been raised, "The third way in which a genus or subgenus comes to be recognised is as a distinct species-group which is in time considered to have a higher status."

sillae with only 1 or 2 distal barbs. Eyes 2+2, not strongly developed. Dorsotibial seta of palp nude. Seven barbed setae and a subterminala on palpal tarsus, in addition to tarsala. Palpal claw 3-pronged. Galeal setae nude or branched. Chelicera with a dorso-external hook-like tooth. Legs 7.7.7-segmented, with sensory setae as follows: *Leg I*: 2 genualae, microgenuala, 2 tibialae, microtibiala, tarsala, microtarsala, subterminala, para-subterminala and pretarsala. *Leg II*: genuala, 2 tibialae, tarsala, microtarsala, and pretarsala. *Leg III*: genuala and tibiala. Leg III also with weakly barbed mastifemorala, mastigenuala and mastitibiala, and with or without a mastitarsala. (Outstanding setae on leg III unrelated to whip-like setae of *Neotrombicula* and fine tapering mastisetiae of *Miyatrombicula*).

Leptotrombidium (Lorillatum) flagelliferum (Traub & Audy), n. comb.

Trombicula flagellifera Trb. and Ady., 1954.

Summarized characters of larva (based on description by Trb. & Ady.): Palpal formula N/N/NNN.7BS; galeal setae nude; palpal claw 3-pronged. Sensilla with 1 distal barb. Dorsal setae 28-32, arranged 2.8.6.6.4.2. Sensory setae of legs as follows: ga 2, gm 1, gp 1, tp 1, MT 1 (with few basal barbs), Mt 1 (with 1 fine barb), MG 1 (with 4-5 basal barbs), MF 1 (long, with several minute basal barbs).

New record: Originally described from *Nannosciurus whiteheadi*, and 2 specimens of *Hylomys suillus*. Also from 5 specimens of *Dremomys everetti*, Trus Madi; "Kijang", *Muntjak muntjak*, base camp, ca. 4000 ft., Trus Madi; "Long tailed shrew", B19223, Tenompak, 4200 ft., Kinabalu; Tree shrew, *Dendrogale melanura*, Tenompak; 4 specimens of *Hylomys suillus*, Mt. Kinabalu. These collections were made in British North Borneo, by R. Traub, J. R. Audy, and myself in July and August, 1953. The larvae were recovered from ear and axillae, mixed with *L. (L.) obscurum*, *L. (L.) deliense*, *L. (L.) baluense*, *L. (L.) pipillae*, *Walchiella oudemansi* and *W. calumosa*.

Leptotrombidium (Lorillatum) tuhanum (Traub & Audy), n. comb.

Trombicula tuhana Trb. and Ady., 1954.

Summarized characters of larva (based on description by Trb. & Ady.): Palpal formula N/N/NNN.7BS; galeal setae branched; palpal claw 3-pronged. Sensillae with 2 distal barbs. Dorsal setae 28-30, arranged 2.8.6.6.4.2. (2). Sensory setae of legs as follows: ga 2, gm 1, gp 1, tp 1, MT 0, Mt 1 (short), MG 1 (short, with basal barbs), MF 1 (with basal barbs).

New record: 2, B49494, Mt. Kinabalu, ca. 4500 ft., British North Borneo, 16. XI. 1958, R. Traub, ex *Callosciurus notatus*, (U. S. Army Medical Research Unit, I. M. R., Malaya).

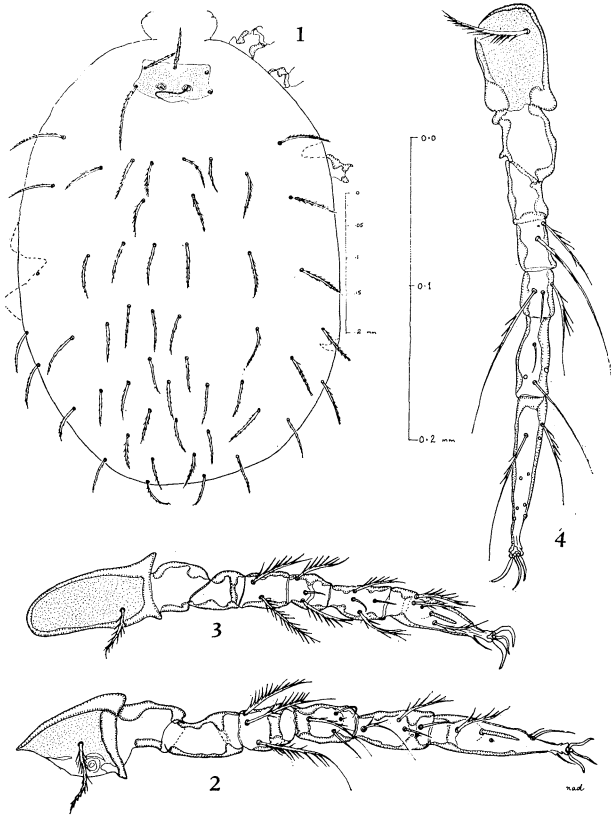
Originally described from *Nannosciurus whiteheadi*.

Leptotrombidium (Lorillatum) mastigophorum Nadchatram, n. sp. Figs. 1-9.

Diagnosis of larva: Near *Leptotrombidium (Lorillatum) flagelliferum* but readily separable by the presence of a branched femoral palpal seta, branched ventrotibial palpal seta, and in having many more dorsal setae. It can be separated from *L. (L.) tuhanum* by the presence of the basally barbed mastitarsala, which is lacking in *tuhanum*.

Description of larva: Fairly large and broadly elongate; when partially engorged 430×

290 μ ; fully engorged 680 \times 460 μ . Color of fresh specimens yellow, and of spirit specimens brown. *Gnathosoma* entirely sclerotized prominently displayed. Cheliceral blade 42 μ long, strong, broad at base, slightly curved, pointed at apex, and with a dorsal subapical denticle. Cheliceral bases minutely and evenly punctate, with thick walls. Palpal formula B/N/NNB.7BS. Femoral and ventrotibial setae of palp with 4-6 long barbs. Palpal tarsus with baso-external tarsala, apical subterminalia, and 7 barbed setae of variable length, one of which is dorsal. Tibial claw 26 μ long, main prong strong, with a well marked dorso-external, and a small ventro-internal accessory prong. Galeal setae well developed, and with 4-6 barbs. Palpal coxal setae strongly pectinate. *Scutum* large, with median concavity of posterior margin and placement of ALs well behind line of anterior margin its distinctive features. Lateral margins incurved between ALs and PLs. Anterolateral margins rounded. Punctae small and generally closely set, but around the sensillary and setal bases (especially of AM) either absent or few. Scutal setae strong AL < AM < PL. PLs placed at posterolateral corners. Posterior 1/2 of sensillary bases in line with PLs. SB with small 'eyebrow' ridges cutting across their anterior halves. Sensillae flagellate, with a small basal barb apparent under oil. Eyes 2+2, on ocular plate, not easily discernable in old mounts.



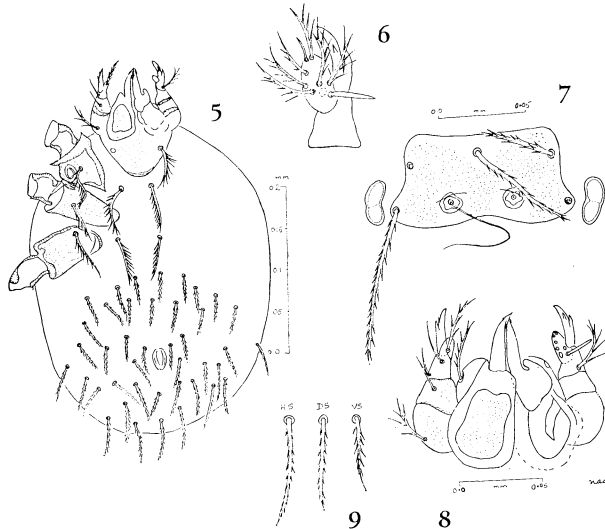
Figs. 1-4. *Leptotrombidium (Lorillatum) mastigophorum*, n. sp., larva. 1, dorsum of idiosoma; 2, 3, & 4, legs I, II, and III respectively, in dorsal view, except for coxae.

Standard measurements in microns of *L. (L.) mastigophorum*, n. sp.

(Holotype and 9 paratypes)

	AW	PW	SB	ASB	PSB	SD	AP	AM	AL	PL	Sens.
Holotype (103921)	86	102	35	36	14	50	27	59	44	92	82
Mean of 10 specimens	80	98	34	36	15	51	27	64	48	91	84
S. D.	2.5	3.5	1.3	1.8	1.4	-	0.8	3.4	2.3	4.2	2.0

Body setae: Dorsal setae strong, with many long and short barbs. Anterodorsal setae arranged in neat transverse rows, but posterior rows somewhat irregular. Dorsal setae 52 in number, roughly arranged 2.8.2.8.2.10.2.8.6.2.2 in specimen illustrated. Ventral setae about 40 in number. HS $65\ \mu$, DS $62\ \mu$, CS $56\ \mu$, VS $42\ \mu$ long. Sternal setae 2+2, distinctly longer than VS and with long barbs; anterior pair $58\ \mu$ long. All coxae unisetose. Coxa I $66\times 46\ \mu$, coxa II $73\times 34\ \mu$, coxa III $75\times 52\ \mu$. Legs all 7-segmented, long and distinctly sclerotized. Leg III longer and more slender than legs I and II. Leg I: Tarsus plus pretarsus $85\times 28\ \mu$, with elongate, tapering tarsala ($31\ \mu$ long), an indistinct microtarsala distal to base of tarsala, subterminala, parsubterminala $1/3$ the length of subterminala; pretarsala arising from tubercle near base of pretarsus, and 20 pectinate and bipectinate setae. Tibia with 2 tibialae in tandem, with a short microtibiala and 7 pectinate setae, the one situated dorsally being finely tapering with 2 or 3 basal barbs. Gena with 2 tapering genualae, a pointed microgenuala, and 1 dorsal and 3 ventral barbed setae, of which the dorsal one is least barbed. Remaining segments, excluding coxa, with 5.1.1 barbed setae. Leg II: Tarsus plus pretarsus $64\times 23\ \mu$, tarsala ($19\ \mu$ long) with a short pointed microtibiala placed proximal to its base, with pretarsala arising from a prominent tubercle at base of pretarsus, and 15 or 16 barbed setae. Tibia with 2 pointed tibialae in tandem and 6 barbed setae. Genu with 1 genuala and 3 barbed setae. Remaining segments, excluding coxa, with 4.2.1 barbed setae. Leg III: Tarsus plus pretarsus $100\times 18\ \mu$. Tarsus with 1 long, fine tapering dorsal seta with 2-3 basal barbs, and 12 ordinary setae. Tibia with tibiala, 1 distal mastitibiala with a single delicate barb, and 4 ordinary setae, one of which is tapering and barbed proximally. Genu with genuala, and 1 long mastigenuala, which except for 2 or 3 indistinct basal barbs, appear nude. Telofemur with 1 long mastifemorala with a few short basal barbs, and 2 ordinary setae. Remaining segments, excluding coxa, with 2.1 ordinary setae. Ventral setae of trochanters I-III strongly bipectinate from base to tip.



Figs. 5-9. *Leptotrombidium (Lorillatum) mastigophorum*, n. sp., larva. 5, venter of idiosoma and gnathosoma, with left half of latter in dorsal view; 6, ventral view of palpal tibiotarsus; 7, scutum and eyes; 8, gnathosoma, dorsally at left, and ventrally at right; 9, humeral, dorsal and ventral body setae, from left to right.

Holotype larva (USNM), Xieng Khouang Province, Lat Huang, 3500 ft., Laos, 19. VIII. 1960, R. E. Leech & Nadchatram, ex *Rattus niveiventer*, N.002. Paratypes (larvae): 9, same data as holotype; 1, same data as holotype but ex R70212, 27. VIII. 1960. Paratypes in the collections of the British Museum (Nat. Hist.), London; Queensland Institute of

Medical Research, Brisbane; G. W. Hooper Foundation (University of California), San Francisco; Bishop Museum, Honolulu; and Col. R. Traub.

These larvae were found mixed with specimens of *L. (L.) deliense* inside the ears of the hosts. Though collections were also made in the lowlands of Borneo and Laos, all 3 species of *Lorillatum* have been found only in highlands at 3500 feet or more. It is assumed, therefore, that they are not lowland forms.

Mean comparative measurements in microns of *Lorillatum* species

	AW	PW	SB	ASB	PSB	SD	AP	AM	AL	PL	Sens.	DS
<i>flagelliferum</i>	72	79	26	31	12	43	31	52	54	68	70	60
<i>tuhanum</i>	59	65	26	21	10	31	23	33	31	55	62	49
<i>mastigophorum</i>	80	98	34	36	15	51	27	64	48	91	84	62

The genus *Leptotrombidium* comprises of 4 subgenera,³ based largely on larval characters. They are *Cotrombidium*, *Leptotrombidium*, *Trombiculindus* and *Hypotrombidium*. To this list I add the new subgenus *Lorillatum*, which is near subgenus *Cotrombidium*. The variation in importance of taxonomic characters among different groups is well exemplified in this genus. The palpal tarsal formulae range from 7B to 7BS; galeal setae are either nude or branched; palpal claw 2-pronged in some species (*baluense*, *pipellae*, *pilalta*, *bodense*), 3-pronged generally; genualae of leg I number 3 in *Hypotrombidium*, but 2 in all other subgenera. The only constant character is the rectangular scutum which is at least 2× as broad as long. Another significant point is that species of *Leptotrombidium* are parasitic largely on ground mammals, but to a very small extent on birds and bats, and not at all on reptiles.

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3. Recent, unpublished observations by Dr. Vercammen-Grandjean show that the subgenus *Farrelloides* Vercammen-Grandjean 1960 is not a *Leptotrombidium*.