FOUR THAI CHIGGERS WITH EXPANDED SENSILLAE (ACARINA, TROMBICULIDAE)

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Summary.

Four trombiculine chiggers are newly recorded or described from Thailand — *Schoutedenichia centralkwangtunga* (Mo *et al.*) from *Cannomys badius* ; *Ascoschoengastia (Laurentella) leechi* Domrow from *Rattus rattus* and *Tupaia glis* ; *A. (L.) kittii* n. sp. from *R. rattus* ; and *Helenicula scanloni* n. sp. from *Menetes berdmorei*, *R. rattus*, *T. glis* and miscellaneous hosts including several species of birds.

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The Thai material detailed below was received through the courtesy of Major John E. SCANLON, U. S. Component, SEATO Medical Research Laboratory, Bangkok, a branch of the Walter Reed Army Institute of Research, U. S. Army Medical Research and Development Command. The specimens were taken as part of the routine research activities of the laboratory, and the collectors are detailed in the text below. Two of the species are described as new, and the other two recorded from Thailand for the first time.

Thai localities can be puzzling except to the *cognoscenti*. The country is divided into 71 provinces *(changwat)*. These are divided into *amphoe* or *amphur*, and these in turn into districts *(tambun)*. Below the *tambun* in this hierarchy is the village or hamlet. In this paper, the *changwat*, *amphoe* and village are listed in that order followed by the approximate latitude and longitude as determined from the maps

of the U. S. Army Map Service, see fig. 1 (based on notes by J. E. S.). See also TAYLOR and ELBEL (1958), who map and list all 71 provinces.

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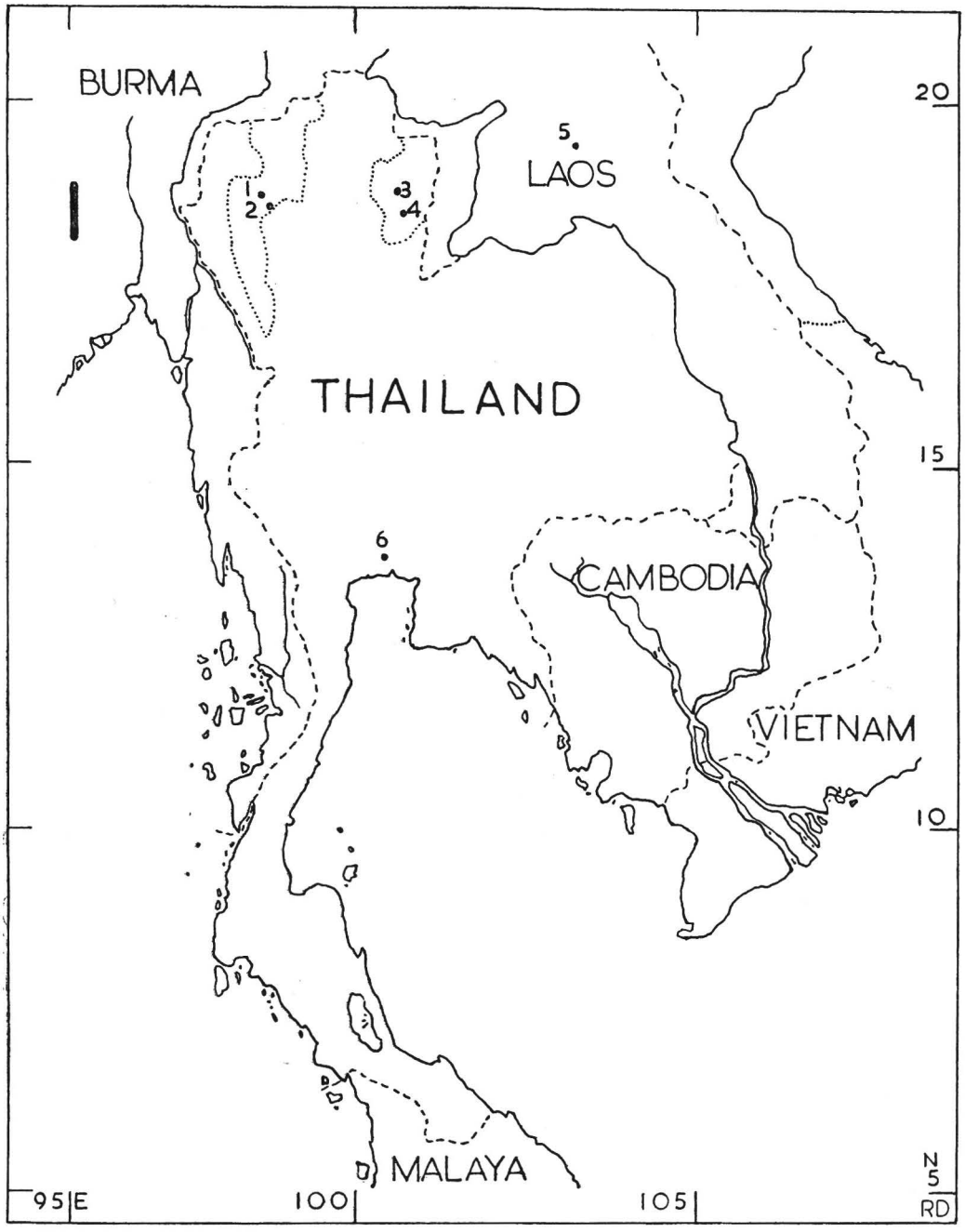


FIG. 1. — Map of Thailand.

The *changwat* of Chiengmai (left) and that of Nan (right) are shown by dotted lines, with the localities mentioned in the text pin-pointed. 1, Doi Suthep and Ban Chang Khien (within one minute of longitude of one another — the former at *c.* 4500′) ; 2, Chiengmai ; 3, Sa ; 4, Ban Pha Hang ; 5, Ban Theuong ; 6, Bangkok.

Medical Research, Kuala Lumpur, for preparing the illustrations for the two new species, while Miss B. NOLAN has typed the ms with her usual care. This paper was supported in part by U. S. Public Health Service Research Grant AI-03793-03 (formerly E3793), National Institute of Allergy and Infectious Diseases.

As far as possible, the specimens detailed below have been distributed, in the same order of priority, to the following institutions — U. S. National Museum, Washington ; British Museum (Natural History), London ; SEATO Medical Research Laboratory, Bangkok ; Institute for Medical Research, Kuala Lumpur ; Queensland Institute of Medical Research, Brisbane ; G. W. Hooper Foundation, San Francisco ; Rocky Mountain Laboratory, Hamilton ; and B. P. Bishop Museum, Honolulu.

Schoutedenichia centralkwangtunga (Mo, Chen, Ho and Li, 1959).

The previous records of this species are from Vietnam and the adjoining Chinese province of Kwang-tung, see DOMROW (1962 *a*). It may now be listed from Thailand — one larva from a bamboo rat, *Cannomys badius* (Rhizomyidae), Nan, Sa, Ban Pha Hang (18° 28'N, 100° 43'E), I.xii.1961, Kitti Thonglongya coll. (Although the scutum is streched and cracked posteriorly — see TRAUB and EVANS (1957) on *Gahrliepia rustica* Gater — one PL is clearly off the scutum. The seemingly high value given below for PW should therefore not be regarded as typical.)

Standard data in micra of larval scutum of S. centralkwangtunga *Mo.* et al.

AW	PW	SB	ASB	PSB	SD	AP	AM	AL	PL	Sens
50	76	40	20	17	37	34	27	22	33	—

Ascoschoengastia (Laurentella) leechi Domrow.

The previous records of this species are from Laos, see DOMROW (1962 *b*). It may now be listed from Thailand — three larvae from *Rattus rattus* (Muridae), Chiengmai, Muang, Ban Chang Khien (18° 50'N, 98° 57'E), 4.iv.1962, three larvae from two *R. rattus*, Chiengmai, Muang, Doi Suthep (18° 50'N, 98° 56'E), 10 and 11.iv.1962 ; one larva from a tree shrew, *Tupaia glis* (Tupaiidae), Doi Suthep, 10.iv. 1962, all collected by Sahem Esah.

In the Thai material, the dorsal setal pattern commences 2.9 + 4 (or 8 + 5), 2.10 + 4 and even (once) 2.11 + 4. Otherwise, the specimens are typical of *A. leechi* as described (2.8 + 4/3). The position of microtarsala I is apparently in error in the original figures — it is placed distally to the tarsala in the Thai specimens and two topotypes compared with them (*Rattus bowersi*, Laos, Xieng Khouang, Ban Theuong, I.ix.1960, R. Leech and M. N.)

Ascoschoengastia (Laurentella) kittii n. sp.

Figs. 2-10.

Diagnosis. — In addition to *A. kittii,* three Asian species of *Ascoschoengastia* are known with a sternal formula 2 + 4. *A. audyi* (Womersley) has DS commencing 2.6 ; *A. mcninchi* Asanuma has 32-34 DS and no mastitarsala III ; while *A. ctenacarus* Domrow has only 28 DS. *A. kittii* shows none of these characteristics.

Types. — Holotype larva and one paratype larva from the ear of *Rattus rattus,* Doi Suthep ; two paratype larvae from the ear of *R. rattus,* Ban Chang Khien, 4.iv.1962, all collected by Sahem Esah. Holotype USNM ; paratypes BMNH, SMRL and IMR.

Larva. — Idiosoma broadly oval, slightly constricted medially ; 385-400 μ long in engorged specimens (mounted). DS weakly barbed, arranged 2.8.4.6.4.6.6.4.2 (42). HS 33-37 μ, DS and CS 23-27 μ long. VS about 36 in number, those near anus 21 μ long. Sternal formula 2 + 4.

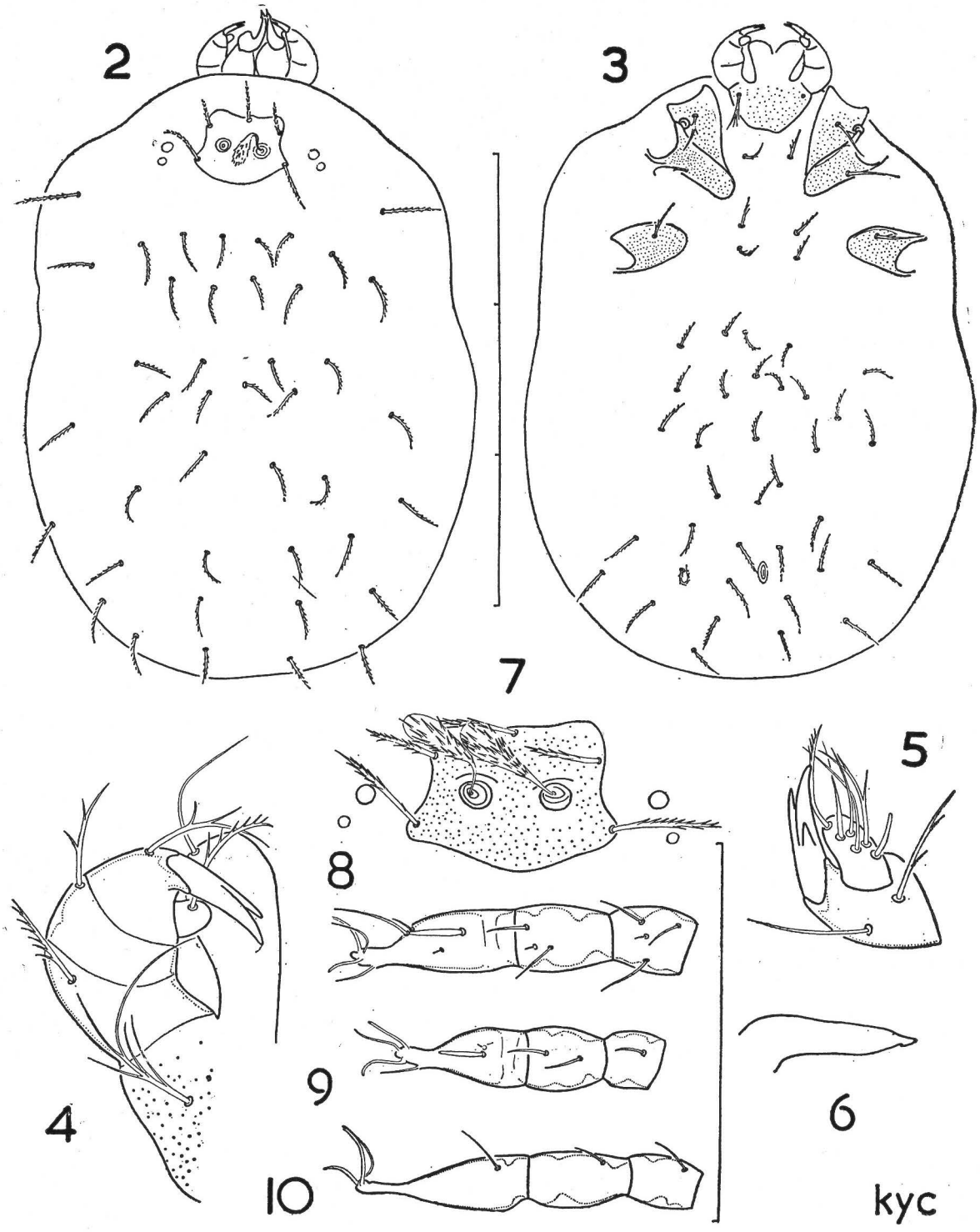
Scutum with AL shoulders typical of subgenus ; surface punctate. Anterior and lateral margins concave ; posterior margin convex, especially in midline. Scutal setae barbed ; PL>AM>AL. Sensillae clavate, with rounded ends and strong barbs. Eyes double, but anterior pair weak and posterior pair obsolescent.

Gnathosoma. Cheliceral blades unarmed except for tricuspid cap. Galeal setae nude. Palpal formula b.b.bnb.6B/n. Subterminala absent. Tibial claw three-pronged, main prong internal, second prong external, and third pronglet ventral.

Legs all seven-segmented. Coxal formula 1.1.1. All tarsi with two claws and slender empodium. Specialized setation as follows — *Tarsus I* with pretarsala, subterminala, parasubterminala, tarsala and microtarsala ; *tibia I* with two tibialae and microtibiala ; *genu I* with three genualae and microgenuala. *Tarsus II* with pretarsala, tarsala and microtarsala ; *tibia II* with two tibialae ; *genu II* with genuala. *Tarsus III* with mastitarsala ; *tibia III* with tibiala ; *genu III* with genuala.

Standard data in micra of larval scutum of A. kittii *n. sp.*

	AW	PW	SB	ASB	PSB	SD	AP	AM	AL	PL	Sens
	44	52	21	20	20	40	20	22	18	29	—
	42	54	22	20	19	39	21	20	16	29	31 × 9
	42	53	22	20	20	40	19	26	20	34	—
	44	57	21	23	24	47	22	23	—	30	—
	43	49	20	20	21	41	19	—	—	30	—
Av.	43	53	21	21	21	41	20	23	18	30	31 × 9



FIGS. 2-10. — *Ascoschoengastia (Laurentella) kittii* n. sp. 2 and 3, Dorsum and venter of idiosoma; 4, Dorsal view of gnathosoma (but with gnathobase in ventral view) ; 5, Ventral view of palpal tibiotarsus ; 6, Chelicera ; 7, Scutum ; 8, 9 and 10, Specialized setation of legs I, II and III. (Each division on the scales equals 100 μ, but figs. 4 and 5 are at twice the indicated scale).

Helenicula scanloni n. sp.

Figs. 11-18.

Diagnosis. — In addition to *H. scanloni*, three other Asian species of *Helenicula* are known with AL>PL and multisetose coxae III. *H. mutabilis* (Gater) has only 40 DS, and SB in front of PL ; *H. sparsa* (Shluger) (*fide* Shluger, in Shluger *et al.*, 1960) has bisetose coxae I ; while *H. simena* (Hsu and Chen) has AM = AW, and AP more than half AW. *H. scanloni* shows none of these characteristics.

Types. — Holotype larva and three paratype larvae from a squirrel, *Menetes berdmorei* (Sciuridae), 12.xii.1961 ; three paratype larvae from *M. berdmorei*, 11.xii. 1961 ; two paratype larvae from *Tupaia glis*, 5.xii.1961 ; one paratype larva from *Rattus rattus*, 10.xii.1961, all collected at Ban Pha Hang by Kitti Thonglongya. Holotype USNM ; paratypes BMNH, SMRL, IMR, QIMR, HF, RML and BM.

The following topotypic material collected by Mr. Kitti should also be noted — seventeen larvae from two *M. berdmorei* ; seven larvae from five *T. glis* ; two larvae from a leopard cat, *Felis bengalensis* (Felidae) ; and one or two larvae each from the following birds — a jungle fowl, *Gallus gallus* (Phasianidae) [1] ; a common coucal, *Centropus sinensis* (Cuculidae) ; a hair-crested drongo, *Dicrurus hottentottus* (Dicruridae) ; a striped babbler, *Pellorneum ruficeps* and a large scimitar babbler, *Pomatorhinus hypoleucos* (Timaliidae).

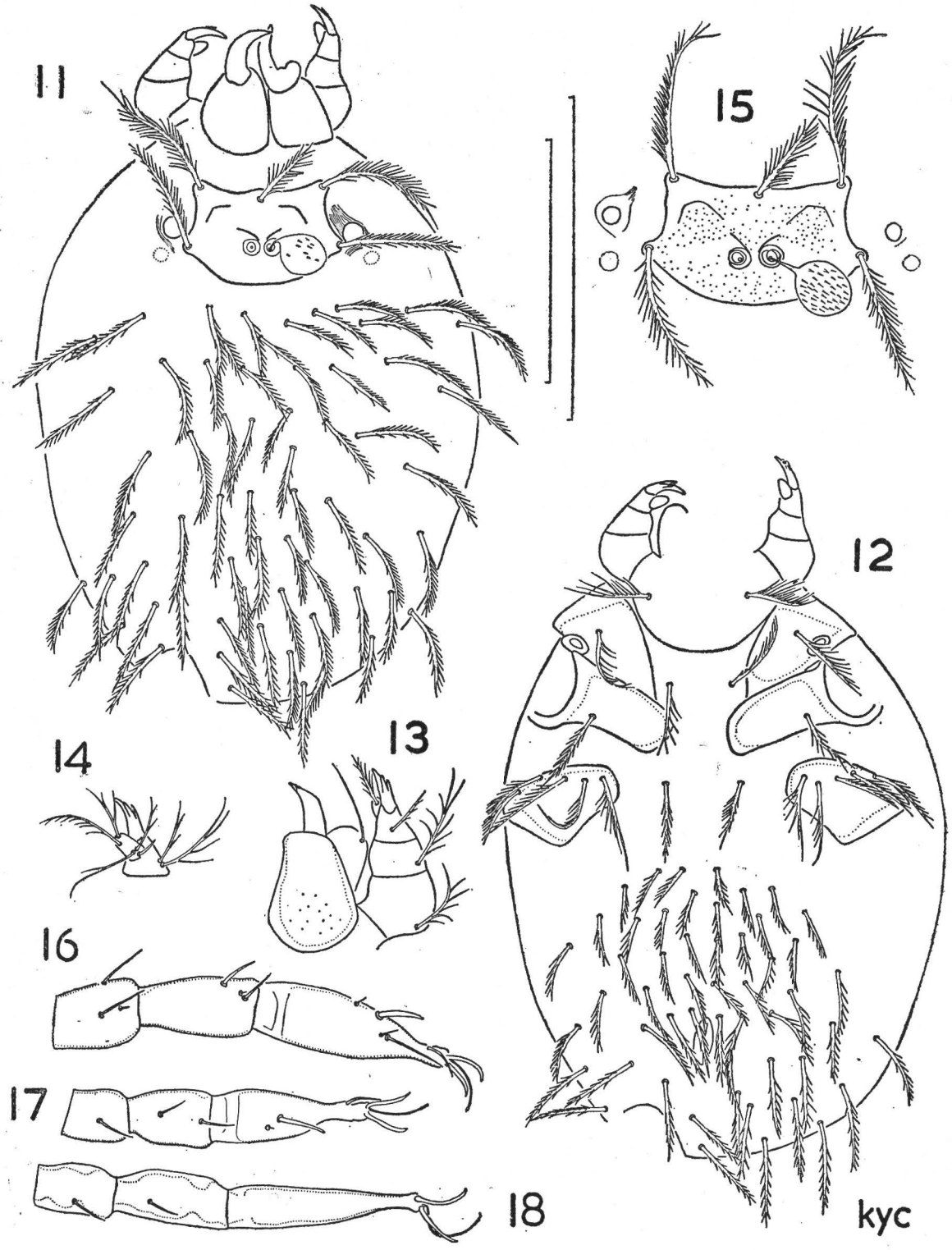
Also four larvae from two *M. berdmorei*, one larva from *R. rattus* and eleven larvae from two laboratory rabbits *(Oryctolagus cuniculus)* exposed in the field, Nan, 15 km S Sa, xii.1961, A. A. Hubert and Phang Ong Wah.

Larva. — Idiosoma oval, 242 μ long in slightly fed specimen, and from 290 to 410 μ long in replete specimens (mounted). DS very strongly barbed, irregularly arranged 4.17.9.8.9.8.5 (60) in holotype. HS not clearly distinguished from DS, 36 μ long ; DS 27-40 μ and CS 35 μ long. VS somewhat weaker, 48-53 in number (50 in holotype), those immediately behind coxae III 21 μ long. Sternal formula 2 + 2.

Scutum wider than long, with weak punctae and sunken anterolaterally to receive sensillae in repose. Anterior margin weakly concave, but lateral margins strongly so ; posterior margin strongly convex. Scutal setae very strongly barbed, AL>PL>AM ; AM barely half AW. SB closely set, slightly behind level of PL ; sensillae globose, barbed. Eyes apparently 1 + 1. Anterior lens convex, dense, strongly defined ; posterior lens only sometimes discernible, and then very weak, evident mainly because of pattern of cuticular striae.

Gnathosoma. Cheliceral bases weakly punctate proximally ; cheliceral blades

1. « The specimens of *Gallus gallus* from which we removed chiggers were all jungle fowl, taken by shooting some distance from villages. They are truly wild birds, and while they interbreed freely with domestic fowl, their ecological situation was quite different » — J. E. S.



FIGS. 11-18. — *Helenicula scanloni* n. sp.

11 and 12, Dorsum and venter of idiosoma ; 13, Dorsal view of gnathosoma ; 14, Ventral view of palpal tibiotarsus ; 15, Scutum ; 16, 17 and 18, Specialized setation of legs I, II and III (with pretarsala I shown dorsally for convenience).

unarmed except for tricuspid cap. Galeal setae nude. Palpal formula B.B.bbb.5B/b. Subterminala absent. Tibial claw three-pronged, main prong internal, flanked externally by weaker dorsal and ventral prongs.

Legs all seven-segmented. Coxal formula 1.1.5 in eight specimens, with coxae III 5.6 and 4.6 in other two specimens. All tarsi with two claws and slender empodium. Tarsala I rather distally placed. Specialized setation as follows — *Tarsus I* with pretarsala, subterminala, parasubterminala, tarsala and microtarsala ; *tibia I* with two tibialae and microtibiala ; *genu I* with two genualae and microgenuala. *Tarsus II* with pretarsala, tarsala and microtarsala ; *tibia II* with two tibialae ; *genu II* with genuala. *Tibia III* with tibiala ; *genu III* with genuala.

Standard data in micra of larval scutum of H. scanloni *n. sp.*

	AW	PW	SB	ASB	PSB	SD	AP	AM	AL	PL	Sens
	50	66	9	27	16	43	24	25	51	46	23 × 16
	55	60	11	26	17	43	23	26	50	49	—
	60	73	12	27	15	42	24	26	52	47	—
	53	66	11	27	17	44	20	—	51	45	—
	49	60	9	23	16	39	23	25	51	47	—
	51	60	10	27	16	43	22	30	60	47	—
	52	62	9	28	16	44	22	29	—	48	—
	49	62	10	26	17	43	23	30	48	46	23 × 15
	52	63	11	23	16	39	25	30	52	45	—
	51	60	9	26	17	43	23	—	—	47	—
Av.	52	63	10	26	16	42	23	28	52	47	23 × 16

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