

A NEW GENUS OF FOLLICLE-INHABITING HYPOPI (GLYCYPHAGIDAE: SARCOPTIFORMES) FROM ASIAN MOLES¹

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----- **ABSTRACT** — A new genus *Asiolabidophorus* (Glyphagidae: Sarcoptiformes) and three new species *A. insularis*, *A. leucurae* and *A. minor* are described from Asian moles. *A. insularis* is collected from *Talpa* sp. from Taiwan, *A. leucurae* from *Talpa leucura* collected in Burma and *A. minor* from *Talpa wogura* collected in Japan. A new combination *Asiolabidophorus mogerae* (Zachvatkin) is given for *Labidophorus mogerae* Zachvatkin, 1941. -----

The new hypopi that are described here were discovered by the senior author in the hair follicles of alcohol-preserved specimens of *Talpa* species of museum collections. These hypopi belong to the subfamily METALABIDOPHORINAE, owing to the shape of the genital suckers, which are elongate, with a conical apex directed internally and with a base situated close to epimera IV. However, they differ from the other known genera in the subfamily by several characters and we think it is necessary to erect for them a new genus, *Asiolabidophorus*.

Asiolabidophorus gen. nov.

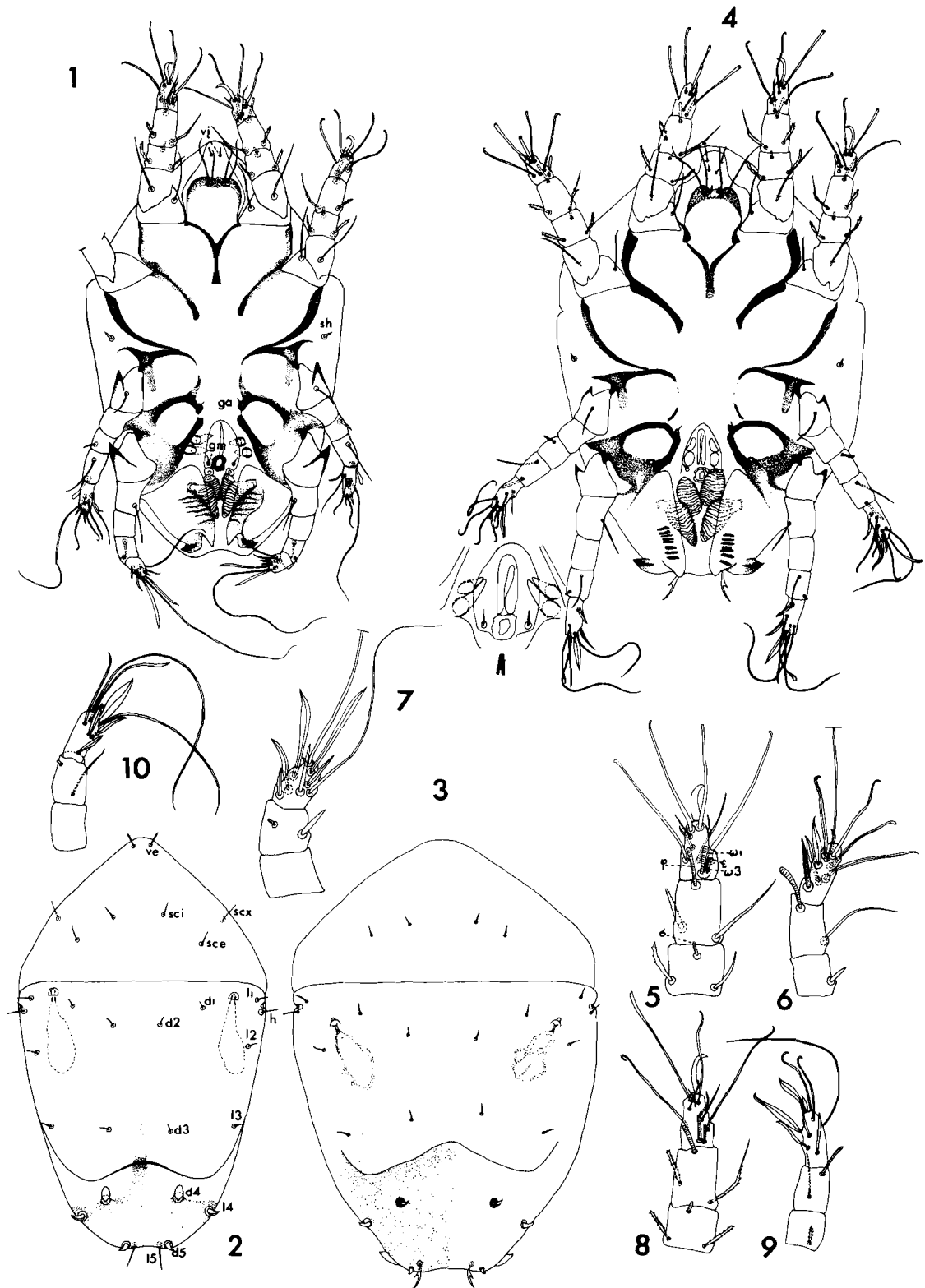
DEFINITION — Hypopi of ovoid shape. Sejugal furrow distinct, may run until ventral side to epimerites II. Posterior furrow may be present in median part, however not running to opisthosomal hooks. Cuticle weakly sclerotized with exception of opisthosoma, epimera and legs. Epimera I fused in long Y-shape, coxal fields III and IV may be almost closed. Lateral protrusions of idiosoma absent. Palposoma well developed with two pairs of long setae and one pair of short solenidia *alpha*. Legs well developed without marked differences in size. Legs I and II with strong sickle-shaped claws, legs III with shorter and thinner curved claw, legs IV with small straight claw. Trochanters III and IV with strong forward directed protrusions. Tibiae III and IV may have ventroapical conical protrusions. Genital valves with *gm* in front of generally large anal pore. Genital suckers generally with lateral bases and conical apices, the latter directed inwards as in the genus *Neotetracopus*. These suckers are shorter than in this genus. Piliocolous organ with two pairs of claspers. Piliocolous voles with terminal hook and partly also with lateral hook. Chaetotaxy of idiosoma: *vi*, *ve*, *sci*, *sce*, dorsal 1-5, lateral 1-5, *h*, *sh*, *ga*, *gm*, *sx*, coxal setae have not been observed in any species. Chaetotaxy of legs: tarsi 8-8-8-8, tibiae 2-2-1-1, genua 2-2-1-0, femora 1-1-0-1, trochanters 1-1-1-0. Solenidiotaxy: tarsi 1-1-0-0, tibiae 1-1-1-1, genua 1-1-0-0. Famulus present. Specialized setae on tibiae III and IV and genu III absent. The *d4* and *l4* are small spines curved forwards. All other idiosomal setae simple.

TYPE SPECIES: — *Asiolabidophorus insularis* spec. nov.

SYSTEMATIC POSITION OF THE GENUS ASIOLABIDOPHORUS

In this new genus the genital suckers are elongate, but less than in *Neotetracopus*. Their bases are lateral in position and their apices are directed inwards. The internal margins of coxae III are raised to form a sclerotized groove to maintain the hair of the host. These characters are shared with the genus *Neotetracopus* Fain. The new genus *Asiolabidophorus* is distinguished

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Figs. 1, 2, 5-7: *Asiolabidophorus insularis* spec. nov. — 1. holotype venter, 2. holotype dorsum, 5. Leg I, 6. Leg III, 7. Leg IV; Figs. 3, 4, 8-10: *Asiolabidophorus leucurae* spec. nov. — 3. holotype dorsum, 4. holotype venter, 8. Leg I, 9. Leg III, 10. Leg IV.

from the latter by the following characters : (1) absence of pointed projections on the lateral surfaces of the opisthosoma. In some species there is, however, a small rounded projection on the anterolateral corner of the pilicolous organ; (2) the setae *d4*, *l4* are small curved spines, directed forwards; and (3) the genital suckers are shorter.

Key to the hypopi of genus *Asiolabidophorus*

1. Posterior furrow present, pilicolous voles large with lateral hooks, coxal fields III and IV almost closed, triangular ventral apical protrusions on tibiae III and IV absent, dorsal glands in front of laterals 2 2
- Posterior furrow absent, pilicolous voles small without lateral hooks, coxal fields III and IV widely open, triangular ventral apical protrusions on tibiae III and IV present, dorsal glands between laterals 2 and 3 3
2. Anterior setae of genua I-III setiform, lateral 5 simple, tibial seta IV broad and short, dorsal gland opening near sejugal furrow, long tarsal seta IV distinctly longer than leg IV *A. insularis* spec. nov.
- Anterior setae of genua I-III serrated, lateral 5 with one strong barb, tibial seta IV filiform, dorsal gland opening between laterals 2 and 3, long tarsal seta IV shorter than leg IV *A. leucurae* spec. nov.
3. Femoral seta II long setiform, *phi* I 35 μ , body length average 270 μ *A. mogerai* (Zachvatkin, 1941)
- Femoral seta II short, broad, spine; *phi* I 26 μ , body length average 230 μ *A. minor* spec. nov.

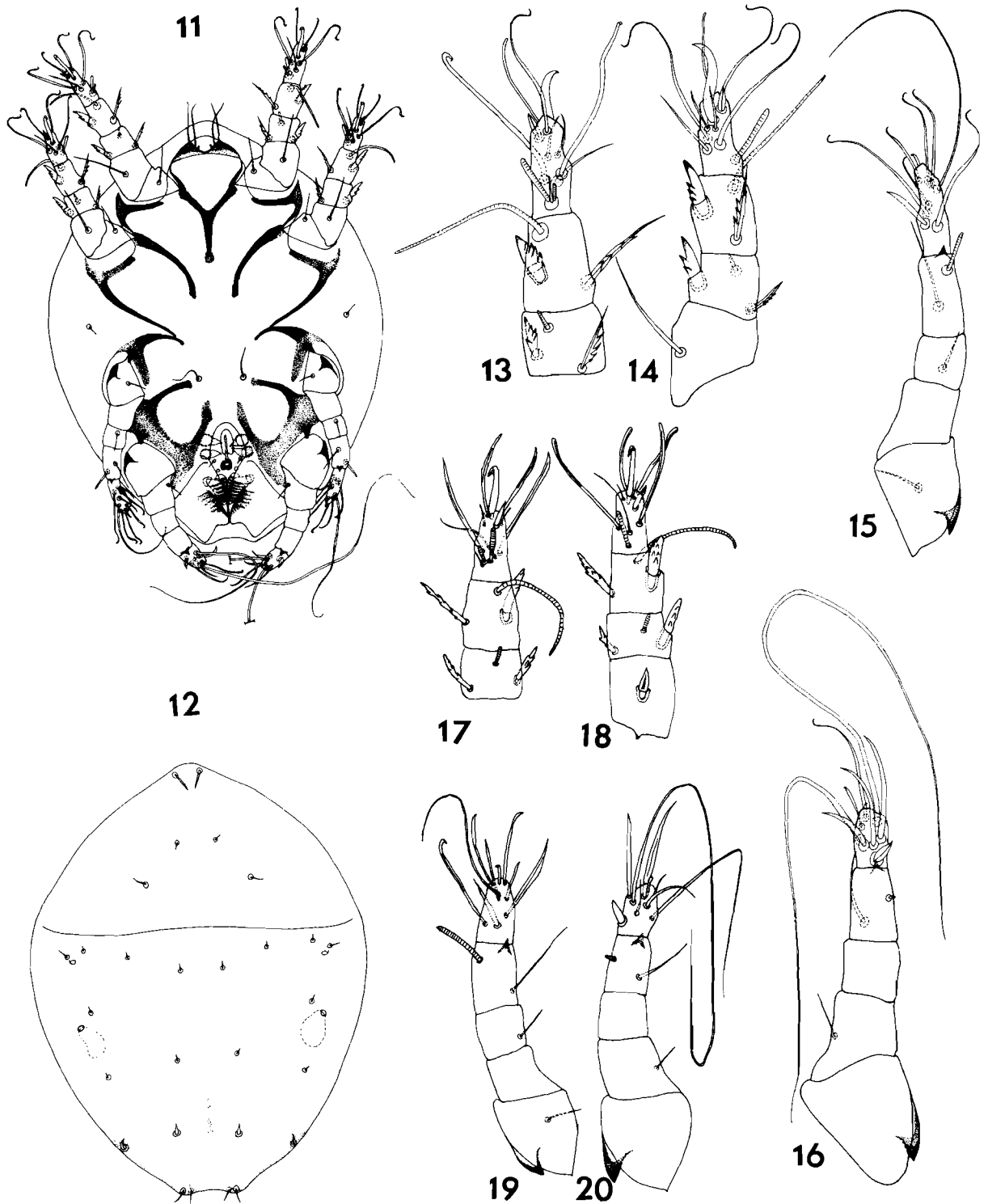
1. *Asiolabidophorus insularis* spec. nov.
(Figs. 1, 2, 5-7)

HYPOPUS — Ovoid in shape with slightly incised posterior border. Cuticle with light sclerotization of pale yellow color. Length of holotype 235 μ and width 150 μ , average in 10 paratypes 235 μ (216-254) long and 163 μ (150-169) wide.

VENTER (Fig. 1) — Well sclerotized epimera I fused in long Y-shape. Posterior end of sternum broadened to slightly bifid in some paratypes. Coxal fields III and IV almost closed. Palposoma distinctly marked with two pairs of relatively strong setae and short solenidia *alpha*. Pilicolous organ well developed and functional (many specimens fixed to hairs of hosts, when pressed out of follicle). Voles of pilicolous organ, not extending beyond caudal end, with posterior and lateral hooks. Inner claspers 15 μ , with 12 ridges, outer claspers 27 μ , with 11 ridges. Genital valves with setae *gm* median and in front of inner claspers. Anal opening unusually large, with a pair of lateral rings. Genital suckers with long conical inner part directed to epimerites IV. Epimerites IV with white ring of vestigial seta.

LEGS (Figs. 5-7) — With five free segments of almost same shape and size (legs III somewhat slender). Legs I and II with strong curved claws of almost tarsus length, leg III with smaller, shorter, curved claw, leg IV with short almost straight claw. Trochanters III and IV with strong forward directed protrusions. Chaetotaxy and solenidiotaxy as given in genus definition. No specialized setae present. Shape of setae as in Fig. 5-7.

DORSUM (Fig. 2) — Sejugal furrow running to epimerites II. Posterior furrow bent forwards on lateral sides. Sclerotization without punctation, stronger on opisthosoma. Dorsal setae 4 and 5 and laterals 4 in shape of broad spines, acting to anchor hypopus within the follicle. Vertical setae serrated, inner scapular setae in front of outer. Most idiosomal setae fairly strong. Long dorsal glands with opening near sejugal furrow. Pores near humerals. Measurements as given in Table I.



Figs. 11, 12, 13-16: *Asiolabidophorus mogerae* (Zachvatkin, 1941) — 11. neotype venter, 12. neotype dorsum, 13. Leg I, 14. Leg II, 15. Leg III, 16. Leg IV ;
 Figs. 17-20: *Asiolabidophorus minor* spec. nov. — 17. Leg I, 18. Leg II, 19. Leg III, 20. Leg IV.

HOST AND LOCALITY — *Talpa* sp. (probably *Talpa insularis*), Chuei-feng, Taiwan, R. E. Kuntz leg. Host in collection of Smithsonian Institution, Washington, coll. no. 333 225. Mites were found in hair follicles of venter with forelegs outside of follicle.

TYPES — Holotype in U.S. National Museum, Washington, D. C. Paratypes (35) in the Acarology Laboratory, Ohio State University, Columbus, Ohio; Field Museum of Natural History, Chicago, Illinois; Muséum National d'Histoire Naturelle, Paris; British Museum (Nat. Hist.), London; Zoologisches Institut und Zoologisches Museum, Hamburg; Institute of Parasitology, Academy of Sciences, Prague; Forschungsinstitut Senckenberg, Frankfurt; Institut de Médecine Tropicale Prince Léopold, Antwerpen; Department of Zoology, Catholic University of Nijmegen, Nijmegen.

2. *Asiobidophorus leucurae* spec. nov.
(Figs. 3, 4, 8-10)

HYPOPUS — Ovoid in shape, with light sclerotization of pale yellow color. Posterior border blunt to slightly concave. Length of holotype 191 μ and width 145 μ ; average in 10 paratypes measured 187 μ (180-197) long and 133 μ (128-135) wide. Closely related to *A. insularis* .

VENTER (Fig. 4) — Posterior end of sternum rounded, coxal fields IV almost closed, light sclerotization near *gm*, coxal fields III in many specimens closed by not always distinct and strongly sclerotized backwards directed bow of epimera III. Pilicolous voles large, stretching beyond posterior border of opisthosoma. Inner claspers 17 μ , with 11-12 ridges, outer claspers 25 μ , with 11-12 ridges. Genital suckers in holotype of normal appearance, in many paratypes directed backward-outwards with distinct conical inner part (Fig. 4). Other characteristics as in *A. insularis* .

LEGS (Figs. 8-10) — Generally similar to legs of *A. insularis* . Long setae of tarsus IV of same length, shorter than leg IV. Shape of setae as in Figs. 8-10 and measurements as given in Table I. Short and very thin supracoxal setae are observed only in squashed preparations.

DORSUM (Fig. 3) — Internal and external scapular setae on about the same level. Vertical setae smooth, sejugal and posterior furrow and metapodosomal setae like in previous species. Laterals 5 12 μ long with characteristic broad barb. Dorsal 4 and 5 and laterals 4 are slightly curved spines. Dorsal gland opening with strongly sclerotized duct between laterals 1 and 2. Other characteristics as in *A. insularis* . Measurements as given in Table I.

HOST AND LOCALITY — *Talpa lecura*, trapped on Mt. Carin in Burma by Fea 1885-89. Host in collection of Zoologisches Museum, Hamburg, coll. no. 4143. Hypopi were found in hair follicles of host, partly attached to hairs in dorsal and ventral parts of thorax and abdomen. Partial propodosoma or only forelegs emerge from skin surface.

TYPES — Holotype in Hamburg. Paratypes (92) in Washington, Columbus, Chicago, Paris, London, Prague, Frankfurt, Antwerpen and Nijmegen.

3. *Asiobidophorus mogerae* (Zachvatkin, 1941) n. comb.
(Figs. 11-16)

Zachvatkin (1941) described and figured *Labidophorus mogerae* from the Far East mole, *Mogera robusta* Nehr. (= now *Talpa wogura coreana*), trapped near Seoul in Korea. Types and paratypes are lost, the three small figures and the description do not give (due to optical outfit of that time) all details necessary for correct affiliation. Thus, Fain (1969) regarded the species for uncertain systematical position.

TABLE 1. Measurements of hypopi of genus *Asiolabidophorus* (in μ).

Measurements	/	<i>insularis</i>	<i>leucuræ</i>	<i>mogerae</i>	<i>minor</i>
<i>ve</i> , <i>vi</i>		8,5	7,3	8,7	6,6
<i>sce</i> , <i>sci</i>		7,9	4,3	7,4	7,3
dorsals 1-5		5,5,5,7,5	5,4,6,5,4	2,2,2,4,6	2,2,2,4,6
laterals 1-5		6,5,5,7,11	5,4,6,5,14	2,2,2,4,6	2,2,2,4,6
humeral		9	8	4	4
<i>alpha</i>		4	4	3	3
palposomal setae:					
intern and extern		23,25	21,23	22,23	20,23
femoral setae I, II		31,28	26,19	31,31	24,8
trochanter setae I, II		26,20	21,15	20,19	17,15
<i>omega</i> 1,3		9,4	7,3	11,4	9,4
<i>phi</i> I, II, III, IV		12,13,14,2	8,10,10,2	35,28,13,2	26,19,12,2
<i>sigma</i> I, II		5,5	2,3	6,5	4,4
tarsus I, II, III, IV		18,15,20,15	16,14,17,17	24,20,20,15	19,17,18,12
claw I, II, III, IV		17,15,6,5	17,17,7,5	19,19,7,4	18,18,7,6
clasper length:					
intern and extern		27,15	22,17	22,11	21,13
clasper ridges:					
intern and extern		11,12	13-14,11-12	6-7,6-7	8,7

Now comparing specimens from the typical host and typical locality we think, that the observed differences are due to optical outfit and not well stretched specimens utilized by Zachvatkin. Thus his observation of the ventral median furrow, the narrow shape and the angle of anterior body border. Small details like absence of posterior furrow, triangular protrusions on tibiae III and IV and the broad spines on tibiae and genua I and II and the spine on tarsus IV show with a high degree of probability, that the species of Zachvatkin corresponds with our specimens. Thus we regard the specimens to be conspecific and give a redescription.

HYPOPUS — broad ovoid in shape, with slightly concave posterior border. Cuticle with faible sclerotization and small white spots.

NEOTYPE — Length 276 μ and width 219 μ , average in 10 specimens measured 270 μ (242-299) long and 184 μ (150-219) wide.

VENTER (Fig.11) — Epimera I fused in long Y-shape, epimera II-IV free. Epimerites IV with broadened anterior ends. Coxal fields III and IV widely open. Pilicolous organ small and perhaps with only temporary function. Only one of the 127 specimens has been found attached to hair of host. Pilicolous voles with inner broad, rounded, hook, but without lateral hooks. Inner claspers 10 μ , with 7-8 ridges, outer claspers 22 μ , with 7-8 ridges. Genital valves with *gm* in median position and in front of inner claspers. Genital suckers with short internal part of conical shape lying in various directions. Anal split and rings in normal smaller size. Lateral protrusions of idiosoma absent. Palposoma well marked with two pairs of long setae and one pair of short solenidia *alpha*.

LEGS (Figs.13-16) — With five free segments, without strongly marked differences in length and size. Legs I and II with strong, long, curved claws and specialized deeply inserted setae on tibiae and genua. These setae are strongly toothed on one side. Legs III and IV with shorter, less curved claws, triangular protrusions on ventral apical side of tibiae and strong forwards directed protrusions on trochanters. Tarsi I and II with four long bandlike broad setae, long spine-like dorsal apical setae, tarsus IV with broad, short spine and long seta of more than

one half of body length. Length of tarsal seta III 88μ , the two longest tarsal setae IV are 105 and 190μ long. Tibial seta II deeply inserted and of setiform shape. Chaetotaxy and solenidiotaxy as in previous species.

DORSUM (Fig. 12) — Sejugal furrow distinct in median part, in some paratypes running to epimerites II. Posterior furrow absent, also in all paratypes this furrow absent. *sci* far in front of *sc e*. Supracoxals not observed, also not in squash preparations. Dorsals and laterals 4 in form of short conical spines directed forwards, dorsals and laterals 5 setiform. Dorsal glands between laterals 2 and 3, pores near humerals. Measurements as given in Table I.

TRITONYMPH — One hypopus contained a fairly chitinized tritonymph, in some characteristics looking like tritonymph of *Labidophorus talpae*.

HOST AND LOCALITIES — *Talpa (Mogera) wogura coreana*, Seoul, Korea, 17 December 1952, Smithsonian Institution, coll. no. 301 904 and 301 905 (neotype); *Mogera wogura*, trapped on 20 September 1972 by K. Uchikawa near Akashina, Nagano District, Japan; *Mogera wogura*, Sutsuma, Japan, collected by Traber, host in collection of Zoologisches Museum, Hamburg, coll. no. 152 4144; *Mogera wogura*, Japan, host in collection of Rijksmuseum van Natuurlijke Historie, Leiden, coll. no. 625.

Hypopi were found in groups, up to 8, in grooves formed by enlarging of follicle opening on venter of abdomen of hosts.

DEPOSITION OF SPECIMENS — Neotype in Washington; specimens in Columbus, Hamburg, Leiden, Tokyo, Chicago, Paris, London, Prague, Frankfurt, Antwerpen and Nijmegen.

4. *Asiolabidophorus minor* spec. nov.
(Figs. 17-20)

HYPOPUS (Figs. 17-20) — Length 228μ and width 186μ , in 10 paratypes measured average 230μ (228-237) long and 183μ (174-195) wide. Dorsum and venter similar to *A. mogerae* but of smaller size. The species is distinguished from *A. mogerae* mainly by the shape of femoral seta II, which is a flattened, broad, spine, like in subfamily LOPHUROMYOPINAE and by length of setae and solenidia. Tarsal seta III 60μ , tarsal setae IV 75 and 143μ , phi I 26μ . Measurements as given in Table I.

HOST AND LOCALITY — *Talpa (Mogera) wogura*, Akashina, Nagano District, Japan, 20 September 1972, trapped by K. Uchikawa. Same host species, Tokyo, 1903, host in collection of Muséum National d'Histoire Naturelle, Paris, coll. no. 1903-123. Hypopi in both hosts were found in the same hair follicles together with previous species.

TYPES — Holotype in National Science Museum (Nat. Hist.), Tokyo. Paratypes (10) in Washington, Columbus, Chicago, London, Prague, Frankfurt, Hamburg, Antwerpen and Nijmegen.

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