

On several new Glomeridae (Diplopoda) from Indochina

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Abstract — Six new Indochinese species of the millipede family Glomeridae are described: *Peplomeris magna* sp. n., *Hyperglomeris maxima* sp. n. and *H. conspicua* sp. n. from North Vietnam, *Hyleoglomeris montana* sp. n., *H. albicollis* sp. n. and *H. crenea* sp. n. from North Thailand. Keys to all the four so far known species of the genus *Hyperglomeris* SILV. (= *Dinoglomeris* SILV., **syn. n.**), as well as to the nine Indochinese species of *Hyleoglomeris* VERH. are provided. With 25 figures.

Present knowledge of the Glomeridae of Indochina is based on but a few papers (VERHOEFF 1915, 1920; SILVESTRI 1917; ATTEMS 1938, 1953), with a total of 12 species from 6 genera or subgenera recognized. Therefore the more agreeable it was for me to have been able recently to accumulate for study several fresh collectings of this group from North Vietnam and North Thailand which proved to comprise six identifiable species, all new to science. The present paper deals with their description and allocation among related forms.

For the opportunity to study the loan material I am most grateful to DRs. Z. KASZAB and S. MAHUNKA of the Hungarian Natural History Museum, Budapest, and to DR. H. ENGHOF of the Universitets Zoologisk Museum, København. Besides, I wish to thank particularly DRs. D. A. KRIVOLUTSKY and L. B. RYBALOV of the Institute of Evolutionary Animal Morphology and Ecology, USSR Academy of Sciences, Moscow, for donating me two nice series of glomerids from Vietnam.

Peplomeris magna sp. n. (Figs 1—5)

Locality: Vietnam, Prov. Ninh binh, Cuc phuong, from pitfall traps in forest, 1 ♂, 5-18 V 1966 (No. 385), leg. G. Topál. — **Material examined**: 1 specimen. — **Holotype**: The above specimen, deposited in the Hungarian Natural History Museum, Budapest.

Diagnosis — Well distinguishable from the only hitherto known species of the genus, *P. demangei* (SILVESTRI, 1917) from Hanoi, Vietnam, by a different colour pattern, longer antennal joint 6, larger hyposchism of chest shield, several details of structure in male leg-pairs 17 to 19.

Description — Length ca. 16 mm, width ca. 9.0 mm. Colour yellowish, with light brown spots: a bit darker, subtriangular paramedian and a somewhat paler, transverse, marble lateral one from each side of terga 3 to 10 (Fig. 1). Chest shield with a similar pattern, though the lateral marble spots extending dorsad at anterior half of the tergum to contact the paramedian pair. Collum without distinct spots, marble, a bit denser along anterior margin. Pygidium also without distinct spots, light marble. Antennal joints 3 to 7 light brown, legs whitish. — Antennae with a long and a little curved dorsad slender joint 6, apically with numerous small cones (Fig. 2). Black convex ocelli 7+1 from each side.

Surface smooth, shining. Collum with 2 usual transverse striae. Chest shield with hyposchism reaching, but not exceeding caudal tergal margin, with 8 (left side) or 9 (right side) very fine striae of which 1st and 2nd (counting from anterior tergal margin) cross dorsum, while 2 or 3 subsequently reaching the dorsum but becoming interrupted and vague. Pygidium with a pair of small, round, paramedian, marginal projections divided by a gentle concavity.

♂. Leg-pair 17 (Fig. 3) with very high outer coxal lobes, telopodite 4-jointed. Leg-pair 18 (Fig. 4) with a round syncoxite notch, telopodite 4-jointed. Pair 19 (telopods) (Fig. 5) greatly enlarged; syncoxite median lingual lamina high, trapeziform, emarginated; syncoxite lateral horns densely setose, only a little higher than lamina, slightly clavate; prefemur with a short, finger-shaped, half-hidden, inner apical process; femur with a large projecting inner lobe from posterior side; tibia with a small papillar round finger distally from caudal side; tarsus relatively small, acute, quickly tapering toward end.

Hyperglomeris maxima sp.n. (Figs 6—10)

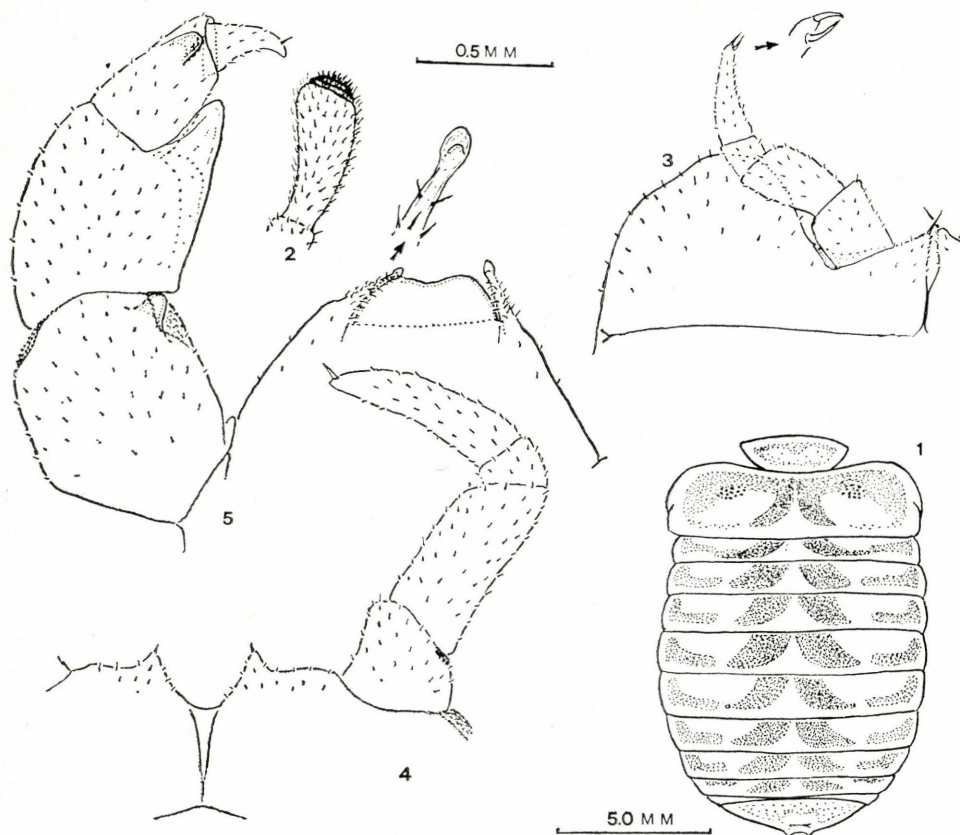
Locality: Vietnam, Prov. Hoa binh, Mai tiao distr., Von mai, secondary tropical forest, 4 ♂ (including holotype), 1 juv., 12 XII 1981, leg. D. A. Krivolutsky et L. B. Rybalov. — Material examined: 5 specimens. — **Holotype** and 2 **paratypes** have been deposited in the Zoological Institute of the USSR Academy of Sciences, Leningrad; one male paratype (dissected) will be placed in the Zoological Museum of the Moscow State University, Moscow; one male paratype has been sent to the Hungarian Natural History Museum, Budapest.

Description — Body 13–14 mm long and 6.0–7.0 mm wide, 14 mm long and 7.0 mm wide in holotype. Colour yellowish-brown, with dark marble brown spots and markings from each side of a thin irregular axial stripe which sometimes (especially in several mid-body terga) coalescing into large (sub)triangular median spots (Fig. 6). Pygidium with a dim darker central spot. Collum marble light brown, without distinct spots. Head and antennae brown, legs greyish-yellow.

Antennae like in *P. magna* sp. n., but apically with 4 larger cones. Black convex ocelli 7+1 from each side.

Surface smooth, shining. Collum quite usual, with 2 transverse striae. Chest shield with hypochism reaching, but not exceeding hind tergal margin, with about a dozen of fine striae of which only 2nd entirely crosses dorsum, whereas some 6 or 7 of subsequent ones, though reaching the dorsum, do so becoming interrupted, vague. Pygidium with a pair of very small round paramedian projections at caudal margin divided by a very gentle concavity.

Leg-pair 17 (Fig. 7) with quite low outer coxal lobes, telopodite 4-jointed. Pair 18 (Fig. 8) with an extremely wide and shallow syncoxite notch, telopodite 4-jointed. Pair 19 (telopods) (Figs 9–10)



Figs 1–5. *Peplomeris magna* sp. n., ♂ holotype: 1 = habitus (dorsal view), 2 = distal part of antenna (drawn not to scale), 3 = leg-pair 17, 4 = leg-pair 18, 5 = telopods (caudal view)



Figs 6-10. *Hyperglomeris maxima* sp. n., ♂ holotype: 6 = habitus (dorsal view, drawn not to scale), ♂ paratype: 7 = leg-pair 17, 8 = leg-pair 18, 9-10 = telopods (frontal and caudal view, respectively)

greatly enlarged; syncoxite median lingual lamina high, trapeziform, gently emarginated; syncoxite lateral horns setose, only a little higher than lobe, apically with a tiny triangular outgrowth; prefemur with a short inner apical finger surmounted by a rudimentary seta; femur with a large inner posterior lobe with a small knob-like finger anteriorly at base, also surmounted by a rudimentary seta; tibia with a good apical inner posterior swelling produced anteriorly in the form of a shelf; tarsus considerably curved, acute, gently tapering toward end.

Hyperglomeris conspicua sp.n. (Figs 11—14)

Locality: Vietnam, Prov. Hoa binh, Mai tiao distr., Von mai, secondary tropical forest, 5 ♂♂ (including holotype), 12 ♀♀, 6 XII 1981, leg. D. A. Krivolutsky et L. B. Rybalov. — Same locality, 6 ♀♀, 7 XII 1981, leg. D. A. Krivolutsky et L. B. Rybalov. — Material examined: 23 specimens. — **Holotype** together with several **paratypes** have been deposited in the Zoological Institute of the USSR Academy of Sciences, Leningrad; several paratypes of both sex will be placed in the Zoological Museum of the Moscow State University, Moscow; one male and one female paratypes have been sent to the Hungarian Natural History Museum, Budapest; one female paratype will go to the Universitets Zoologisk Museum, København.

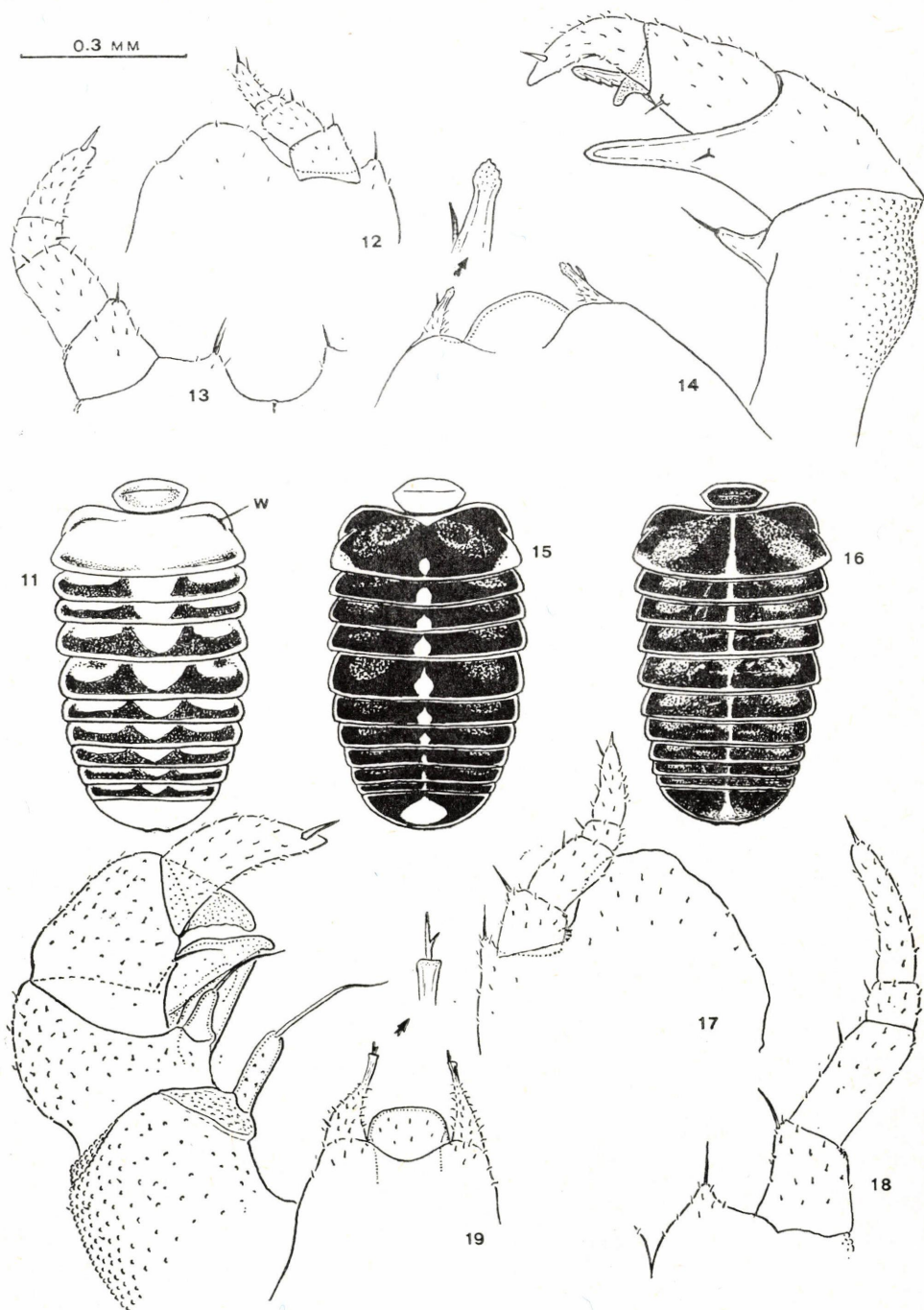
Description — Males up to 7 mm long and 3.0 mm wide (holotype), females up to 8 mm long and 3.5 mm wide. Colour yellow, with dark brown to brown transverse spots (Fig. 11) sometimes absent on chest shield. Pygidium without spots. Head and collum sometimes light brown, legs pale, distal halves of tarsi sometimes brown. — Antennae with somewhat shorter joint 6 which is ca. 2.0 times longer than wide, apically with 4 larger cones. Black convex ocelli 7 + 1 from each side.

Surface smooth, shining. Collum with usual 2 transverse striae. Chest shield with a smaller hyposchism not reaching caudal tergal margin, from each side with a deep sulcus (w) extending antero-dorsad from the anteriormost part of schism (Fig. 11), without further striae. Pygidium with a pair of very small marginal round paramedian projections divided by a very poor and gentle concavity in males, regularly round-margined in females.

♂. Leg-pair 17 (Fig. 12) with moderately high outer coxal lobes, telopodite 4-jointed. Pair 18 (Fig. 13) with a broadly round syncoxite notch, telopodite 4-jointed. Pair 19 (telopods) (Fig. 14) greatly enlarged; syncoxite median lingual lamina almost regularly semi-circular, rather high; syncoxite lateral horns a little higher than lamina, setose, subtriangular at the apex, disto-laterally with a good spine; prefemur with a short, stout, setiferous disto-mesal process (finger); femur with very long and slender posterior finger-shaped inner process with setiferous anterior knob at base; tibia with a very conspicuous, serrate, long (ca. 2/3 as long as tarsus), posterior apical process, with a good membranous inner hook, and a small subterminal setiferous knob anteriorly; tarsus considerably curved, acute, gently tapering toward end.

Remarks — Ever since SILVESTRI's (1917) erection of two monotypical genera, *Hyperglomeris* and *Dinoglomeris*, to comprise the new species *H. lamellosa* SILV. and *D. dirupta* SILV. from North Vietnam, both the genera have been considered good (MAURIÈS 1971, HOFFMAN 1979). However, the only distinguishing character, as SILVESTRI (1917) noted by himself, was the presence or absence at base of the telopod inner femoral process of a small anterior finger to support a seta: *Dinoglomeris* with such finger, *Hyperglomeris* without it. This distinction, suspicious enough in itself, in the light of the new discoveries should be abandoned now altogether, for in *H. maxima* sp. n. the finger is already quite small and readily reminds the poor knob in *H. conspicua* sp. n. To formalize the issue, I consider *Hyperglomeris* SILV. a subjective senior synonym of *Dinoglomeris* SILV., all the four so far known species of this genus being easily distinguishable by the key below.

Perhaps it is necessary to remind that *Hyperglomeris* in its present broader concept is most closely related to the large genus *Hyleoglomeris* also of Oriental origin. However, the latter possesses the posterior telopod femoral process much larger and with an apical membranous sack, and the tibia of the telopods without good posterior processes or swellings.



Figs 11–14. *Hyperglomeris conspicua* sp. n., ♂ paratype: 11 = habitus (dorsal view, drawn not to scale), 12 = leg-pair 17, 13 = leg-pair 18, 14 = leg-pair 19 (frontal view). — Fig. 15. *Hyleoglomeris albicollis* sp. n., ♂ holotype, habitus (dorsal view, drawn not to scale). — Figs 16–19. *Hyleoglomeris montana* sp. n., ♂ paratype: 16 = habitus (dorsal view, drawn not to scale), 17 = leg-pair 17, 18 = leg-pair 18, 19 = telopods (frontal view)

A KEY TO THE KNOWN SPECIES OF *HYPERGLOMERIS* SILVESTRI

- 1 (2) Pygidium entirely, chest shield almost or entirely depigmented; latter without fine striae, but with a good sulcus antero-dorsad of the schism; syncoxite 18 notch broadly round, telopod syncoxite lateral horns with an outer distal spine each; telopod caudal tibial process very long, slender, serrate, reaching ca. 2/3 tarsal length

***H. conspicua* sp. n.**

- 2 (1) Both pygidium and chest shield with dark pigment; chest shield with a number of fine striae, but without deep sulci; notch of male syncoxite 18 not round; lateral horns of telopod syncoxite without outer spines; telopod caudal tibial process or swelling far from that long

- 3 (4) A thin dark axial stripe upon lighter background of dorsum, chest hyposchism larger, reaching caudal tergal margin; lateral lobes of male coxite 17 quite low; male syncoxite 18 notch extremely broadly triangular; median lingual lamina of telopod syncoxite trapeziform, gently, but evidently emarginated

***H. maxima* sp. n.**

- 4 (3) No dark axial stripe along dorsum, dorsal background black to red-yellow; chest hyposchism smaller, not reaching tergal caudal margin; lateral lobes of male coxite 17 higher; notch of male syncoxite 18 ogive; telopod syncoxite median lamina not emarginated

- 5 (6) Chest hyposchism only a little not reaching tergal caudal margin; telopod syncoxite median lamina trapeziform, with evidently truncate ventral margin

***H. dirupta* (SILV.) comb. n.**

- 6 (5) Chest hyposchism almost wanting; telopod syncoxite median lamina regularly rounded, semi-circular

H. lamellosa* SILV.**Hyleoglomeris montana* sp.n. (Figs 16–19)**

Locality: Thailand, Prov. Chiang Mai, Doi Inthanon, summit, 2500 m, 2 ♂♂ (including holotype), 3 ♀♀, 1 juv. — 7 X 1981, leg. Zool. Museum København. — **Material examined:** 6 specimens. — **Holotype**, 1 female and the juvenile paratypes are deposited in the Universitets Zoologisk Museum, København; 1 female paratype even is in the Hungarian Natural History Museum Budapest, and Coll. Golovatch, Moscow.

Description — Males 7.0 mm long and ca. 4.0 mm wide (holotype), females 9.5–12.0 mm long and 4.6–4.8 mm wide. Colour black-brown, with yellow-whitish thin axial stripe, pairs of large marble brown lateral spots, sometimes (in adult paratypes) with background irregularly interrupted by small light markings (Fig. 16). Collum dark brown, with a large lighter marble central spot. Pygidium with a caudal widening of the light axial stripe. Head and antennae brown, latter ones especially dark distally. Legs whitish. — Antennae usual, apically with 4 larger cones, joint 6 ca. 2.0 times longer than wide. Black convex ocelli 6 + 1 from each side.

Surface smooth, shining. Collum with 2 usual transverse striae. Chest shield with a large hyposchism reaching, but not protruding beyond hind tergal margin, with 10–13 fine striae of which up to 7 lying above schism and only four entirely crossing dorsum. Pygidium delicately sinuate medio-caudally in males, regularly margined in females.

♂. Leg-pair 17 (Fig. 17) with very high outer coxal lobes, telopodite 4-jointed. Leg-pair 18 (Fig. 18) with an ogive syncoxite notch, telopodite 4-jointed. Telopods greatly enlarged (Fig. 19); syncoxite median lingual lamina subtrapeziform, with rounded ventral angles; syncoxite lateral horns very high, slender, apically with a long hyaline bifid seta each, densely setose; prefemur with a long inner apical finger crowned by a long flagelloid; femur anteriorly with a similar apical inner digitoid process, but surmounted by a shorter flagelloid, posteriorly with a very large lobe apically membranous and slightly curved; tibia anteriorly with a long distal inner seta, posteriorly with a large membranous hook-like inner process; tarsus quite slightly curved, acute, very gently tapering toward end.

Hyleoglomeris albicollis sp.n. (Figs 15, 20-22)

Locality: Thailand, Prov. Chiang Mai, Doi Inthanon N. P., Mae Chaem, 1700 m, road, 1 ♂, 15 X 1981, leg. Zool. Museum København. — Material examined: 1 specimen. — Holotype is deposited in the Universitets Zoologisk Museum, København.

Description — Body 11 mm long and 5.0 mm wide. Colour black, with yellowish spots: a small median at hind margin and a pair of larger lateral marble ones on each tergum but collum and pygidium. Chest shield with yellowish postero-lateral corners, collum entirely yellow, without darker pigment, pygidium with a large median subtriangular spot at hind margin. Head and antennae dark brown, legs whitish, only distal halves of tarsi a bit brownish (Fig. 15). — Antennal joint 6 long, ca. 2.2 times longer than wide. Black convex ocelli 6 + 1 from each side.

Surface smooth, shining. Collum with 2 usual transverse striae. Chest shield with a large hypochism reaching, but not projecting beyond hind tergal margin, with 8 fine striae of which (counting from anterior tergal margin) 1st, 4th and 7th entirely crossing dorsum. Pygidium regularly margined, without peculiarities.



Figs 20-22. *Hyleoglomeris albicollis* sp. n., ♂ holotype: 20 = leg-pair 17, 21 = leg-pair 18, 22 = telopods (frontal view)

♂. Leg-pair 17 (Fig. 20) with rather high outer coxal lobes, telopodite 4-jointed. Pair 18 (Fig. 21) with a round syncoxite notch, telopodite 4-jointed. Leg-pair 19 (telopods) (Fig. 22) very massive; median lingual lamina of syncoxite subtrapeziform, emarginated, with rounded ventro-lateral corners; syncoxite lateral horns very high, slender, setose, apically with a very short setoid in front of a tiny round lobe; prefemur with a very long inner apical finger crowned with a long flagelloid; femur with a similar smaller antero-mesal finger also crowned by a long flagelloid, posteriorly with a large inner lobe surmounted by a membranous sack curved forward; tibia with a long antero-mesal seta, posteriorly with an indistinct membranous process; tarsus considerably curved, gently tapering toward end.

Hyleoglomeris cremea sp.n. (Figs 23–25)

Locality: North Thailand, Chiang Dao, 1800 m, 3 ♂♂ (including holotype), 5 ♀♀, 1958–59, leg. B. Degerbøl. — **Material examined:** 8 specimens. — **Holotype**, together with 1 male and 4 female paratypes are deposited in the Universitets Zoologisk Museum, København; 1 female paratype is in the Hungarian Natural History Museum, Budapest; 1 male paratype is retained in Coll. Golovatch, Moscow.

Description — Body 8–12 mm long and 3.6–5.5 mm wide in males (10 and 4.2 mm in holotype), 10–15 mm long and 4.5–7.0 mm in females. Colour yellowish-brown; collum, chest shield and almost all pygidium (except for the antero-lateral corners) yellowish, other terga almost all darker, brownish, with a more or less wide axial light stripe. Head and antennae yellowish-brown to brown, legs light yellowish-brown. — Antennal joint 6 ca. 2.0 times as long as wide. Black-brown convex ocelli 7+1 from each side.

Surface smooth, shining. Collum with 2 usual transverse striae. Chest shield with a rather large hypochism almost reaching hind tergal margin, with 9–11 fine striae of which 6 crossing the dorsum (always 1st and 2nd, but never 3rd). Male pygidium very slightly sinuate medio-caudally, without modifications in females.

♂. Leg-pair 17 (Fig. 23) with rather high outer coxal lobes, telopodite 4-jointed. Pair 18 (Fig. 24) with syncoxite notch ogive, telopodite 4-jointed. Telopods (Fig. 25) greatly enlarged; syncoxite medial lamina prominent, subovoid; syncoxite lateral horn high, slender, setose, apically with a good setoid; prefemur with usual long flagelliferous finger; femur with a similar, but stout antero-mesal finger crowned by a flagelloid and posteriorly with a big lobe apically bearing a membranous sack curved forward; tibia with a long antero-apical inner seta, posteriorly with an indistinct apical inner membranous process; tarsus rather gently curved, very moderately tapering toward end.

Remarks — Six species of *Hyleoglomeris* have hitherto been known from Indochina: *H. triangulifera* ATT., *H. robusta* ATT., *H. maior* ATT., *H. pulchra* ATT., *H. electa* SILV. and *H. siamensis* SILV. The latter is the only one known from continental Thailand. The discovery of the three new *Hyleoglomeris* in North Thailand not only enriches the local fauna, but also provides the opportunity to arrange all the Indochinese species of this genus in a tentative key. As several of these forms have been described but by females, the key below chiefly deals with colour patterns. It should be remembered, however, that the colour patterns described above and hereinafter disregard the usually light lateral and posterior tergal margins.

A KEY TO THE INDOCHINESE SPECIES OF *HYLEOGLÖMERIS* VERHOEFF

- 1 (2) Collum entirely depigmented (yellow), well contrasting with much darker (black) pigmentation of the other terga
 - H. albicollis* sp. n.
- 2 (1) Collum at least partly with dark pigment, light brown to black, usually marble 3
- 3 (10) Chest shield and pygidium entirely or mainly light, whitish to brown; spots, when present, darker than background 4
- 4 (7) Chest shield and pygidium with distinct spots or markings 5

- 5 (6) Chest shield yellowish-brown, pygidium whitish-yellow, both with darker spots, still well contrasting with black background of terga 3 to 11 provided with 3 rows of large yellowish spots; larger: 6.5 mm wide

H. triangulifera ATT.



Figs 23-25. *Hyleoglomeris crema* sp. n., ♂ paratype: 23 = leg-pair 17, 24 = leg-pair 18, 25 = telopods (frontal view)

- 6 (5) Chest shield and pygidium cream-brown, each with a pair of darker spots, not contrasting with cream-brown terga 3 to 11; smaller: 5 mm wide **H. siamensis** SILV.
- 7 (4) Chest shield and pygidium without distinct spots 8
- 8 (9) Collum, chest shield and pygidium only slightly lighter than and not contrasting with light brown or brown terga 3 to 11 which have a more or less wide, regular, lighter axial stripe; larger: 4.5 to 7.0 mm wide **H. cremea** sp. n.
- 9 (8) Collum darker, chest shield and pygidium orange-yellowish, well contrasting with black background of terga 3 to 11 each provided with a large, median, yellowish spot; smaller: 3 mm wide **H. pulchra** ATT.
- 10 (3) Chest shield and pygidium mainly dark, dark brown to black; spots, when present, lighter than background 11
- 11 (12) Chest shield to segment 4 completely dark, black, without lighter spots or markings; larger: 7-9 mm wide **H. maior** ATT.
- 12 (11) Chest shield to segment 4 also with several more or less distinct lighter spots or markings 13
- 13 (14) A thin, more or less regular, whitish axial stripe from chest shield to pygidium **H. montana** sp. n.
- 14 (13) From chest shield to pygidium no axial stripe, but separate small spots at best 15
- 15 (16) From chest shield to pygidium 3 rows of brown-yellowish spots: one median and a pair of large marble lateral ones; pygidium with a large median spot, but without lateral ones **H. electa** SILV.
- 16 (15) From chest shield to pygidium no axial row of spots; pygidium with a large median and a pair of marble brown-yellowish lateral spots **H. robustus** ATT.

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