

Lepidonella sirindhornae sp. nov. (Entomobryidae: Paronellinae), A New Collembola species from Southern Thailand

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ABSTRACT.— The genus *Lepidonella* is widely distributed across Southeast Asia, South Asia, Papua New Guinea, the Melanesian region, Australia, Africa, and the Americas. To date, only a single species of the genus has been formally recorded from Thailand. However, numerous undescribed species, particularly from southern Thailand, have been reported, indicating a greater diversity than currently recognized. This study presents the first formal description of a *Lepidonella* species from a cave habitat in the country. *Lepidonella sirindhornae* Nilsai & Jantarit, sp. nov. is described and illustrated from Tham Phraya Bangsa in Satun Province. The new species is distinguished from its congeners by a unique combination of morphological characters, including labial chaetotaxy formula (M1m2rEL1L2), elongation of antennal length (3.5–5.1 antenna: head ratio), presence of 6+6 eyes and a distinctive number of chaetae on both the anterior and posterior surfaces of the ventral tube. Additionally, this study provides a distribution map of the genus *Lepidonella* found in Thailand, underscoring the diversity of cave-dwelling species in the region and the need for further taxonomic investigation.

KEYWORDS: cave, Entomobryoidea, Isthmus of Kra, new species, taxonomy

INTRODUCTION

The genus *Lepidonella* is classified within the subfamily Paronellinae Börner, 1906 of the family Entomobryidae, following the classification framework of Go-deiro et al. (2023). It was established by Yosii in 1960, with *Lepidonella tokiokai* from the Solomon Islands designated as the type species. Species of this genus are characterized by the presence of 3–8+3–8 eyes, antennae that do not exceed the body length, and a first antennal segment that is shorter than the head. The fourth antennal segment is neither subdivided nor annulated. Scales are present on the body and may also occur on the appendages. The trichobothrial pattern is 1/0,0/0,2, 3,2, and the posterior line of pseudopores is absent on abdominal segment IV. Additional diagnostic features include two rows of dental spines and a short, plump mucro bearing 3–4 teeth. (Yosii, 1960; Soto-Adames and Bellini 2015; Deharveng et al., 2018).

The genus *Lepidonella* currently comprises 15 described species, distributed across various regions globally (Bellinger et al., 2025; Deharveng et al., 2018; Soto-Adames and Bellini, 2015). Its known distribution spans from Papua New Guinea and the Melanesian region of the Solomon Islands to Australia, South Asia (India and Sri Lanka), Southeast Asia (Indonesia, Cambodia, Malaysia, Vietnam, and Thailand), Africa (Republic of Seychelles), and the Americas (Brazil, Dominican Republic, and Puerto Rico) (Deharveng et al., 2018). Notably, Southeast Asia represents the center of

diversity for the genus, with nine species recorded from this region—accounting for approximately 60% of all currently known *Lepidonella* species.

Despite this apparent diversity, the taxonomic status of several species within the genus remains uncertain. Some taxa described during the early 20th century may require reassignment, as their morphological characteristics do not align with the most recent diagnostic criteria for the genus. For instance, *L. monomaculata* (Barra, 1969) and *L. vivieni* (Barra, 1969) were transferred to the genus *Trogolaphysa* by Soto-Adames and Bellini (2015), based on the chaetotaxy of abdominal segment IV. At the same time, *L. incerta* (Handschin, 1925) was synonymised as *L. marimuti* Soto-Adames & Bellini, 2015. However, in a subsequent revision, Deharveng et al. (2018) considered *L. marimuti* as *incertae sedis* within *Lepidonella*, citing several discordant morphological traits, including the presence of an apical bulb on antennal segment IV. Additionally, *Pseudoparonella doveri* Carpenter, 1933 was redescribed and transferred to genus *Lepidonella* as *L. doveri* (Carpenter, 1933), based on its close morphological similarity to *L. lecongkietii* Deharveng & Bedos, 1995 (Deharveng et al., 2018). These revisions highlight the need for continued taxonomic reassessment of the genus to clarify species boundaries and ensure accurate classification.

In Thailand, the only previously reported epigeal species of *Lepidonella* is *L. ceylonica* (Yosii, 1966), which was collected from mixed dry deciduous forest

and deforested forest litter in Khon Kaen Province, Northeastern Thailand. However, numerous undescribed species from northern and northeastern regions of the country are known to exist (Deharveng and Bedos, 1995; Jantarit et al., 2016). Recent fieldwork across Thailand revealed that cave-dwelling *Lepidonella* species are restricted to the Thai–Malay Peninsula; however, no cave-associated species had been previously described from this region. In this study, we describe and illustrate a new *Lepidonella* species, representing the first record from a cave habitat in southern Thailand.

MATERIALS AND METHODS

The study is based on specimens collected in 2016 using entomological aspirators under the authorized project number 5911702, at Tham Phraya Bangsa, Nong Phak Phraya and Khao Raya Bangsa Non-Hunting Area, Satun Province, Thailand. The work was approved by The Thaksin University Ethics Committee on Animals under COA No. TSU 2025-006. The collected specimens were preserved in 95% ethanol and subsequently cleared in Nesbitt's fluid before being mounted on slides in Marc André II medium. The morphological examination and drawings were performed using Nikon Eclipse Ci-L plus Upright Microscope equipped with phase-contrast optics. Illustrations were finalized digitally using Adobe Illustrator CC/PC (Adobe Inc.). Photos of the habitus were taken with a Canon EOS 6D camera paired with a Canon EF100 mm f/2.8 Macro lens and processed using Helicon Remote software. All final figures were edited and enhanced using Photoshop CS5 (Adobe Inc.). The map was taken and modified from Mitrearth (<http://www.mitrearth.org/>).

Abbreviations used in the description

- asl. – above sea level
- Ant. – antennal segment
- Th. – thoracic segment
- Abd. – abdominal segment
- mac – macrochaeta
- mes – mesochaeta
- mic – microchaeta
- sens or S-chaeta – sensillum or sensory seta
- ms – very short, thick pointed S-chaetae
- tric – trichobotrium
- tita – tibiotarsus
- psp – pseudopore
- VT – Ventral tube

The dorsal chaetotaxy of the head follows the AMS system proposed by Jordana and Baquero (2005) and

Soto-Adames (2008), while body chaetotaxy is interpreted according to the schemes of Szeptycki (1979), Mitra (1993), Soto-Adames and Bellini (2015), and Zhang et al. (2019). The notation for groups of head chaetae follows Mari Mutt (1979) and Soto-Adames (2008), and the terminology for the labial palp is based on Fjellberg (1999). Labial chaetae are designated following the system of Gisin (1967), using uppercase letters for ciliated chaetae and lowercase letters for smooth chaetae. Macrochaeta counts are given by half-tergite in species descriptions.

Type specimens are deposited in the Princess Maha Chakri Sirindhorn Natural History Museum (PSU-NHM) and the Faculty of Science and Digital Innovation, Thaksin University (TSU), Thailand.

The following symbols are used in the figures to represent chaetal types:

- Large open circle = mac (macrochaetae)
- Medium open circle = mes (mesochaetae)
- Solid dot = mic (microchaetae)
- Cross (×) = tric (trichobotrium/trichobothria)
- Circle with a slash (ø) = psp (pseudopores)

RESULTS

Taxonomy

Family Entomobryidae Womersley, 1934
sensu Godeiro et al., 2023

Subfamily Paronellinae Börner, 1906
sensu Godeiro et al., 2023

Genus *Lepidonella* Yosii, 1960

***Lepidonella sirindhornae* Nilsai & Jantarit, sp. nov.**

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(Figs 1–4, Table 1)

Material examined.– **Holotype:** Male on slide: sample, (sample # THA-AN-STN08); Thailand: Satun: Mueang District, Tham Phraya Bangsa (Tham = cave), 6.77541°N, 100.04161°E, altitude 23 m, near cave entrance, at the twilight and dark zone, by aspirator, coll. A. Nilsai, 5.x.2016. **Paratypes:** Two females, five probably subadult specimens on slides (genital plate not clearly seen) and 7 specimens in alcohol, same data as holotype. Two paratypes (one female and one subadult) were deposited in PSU-NHM, and the others are in TSU.

Etymology.– The species is named in honor of Her Royal Highness Princess Maha Chakri Sirindhorn, in recognition of her profound interest in natural history

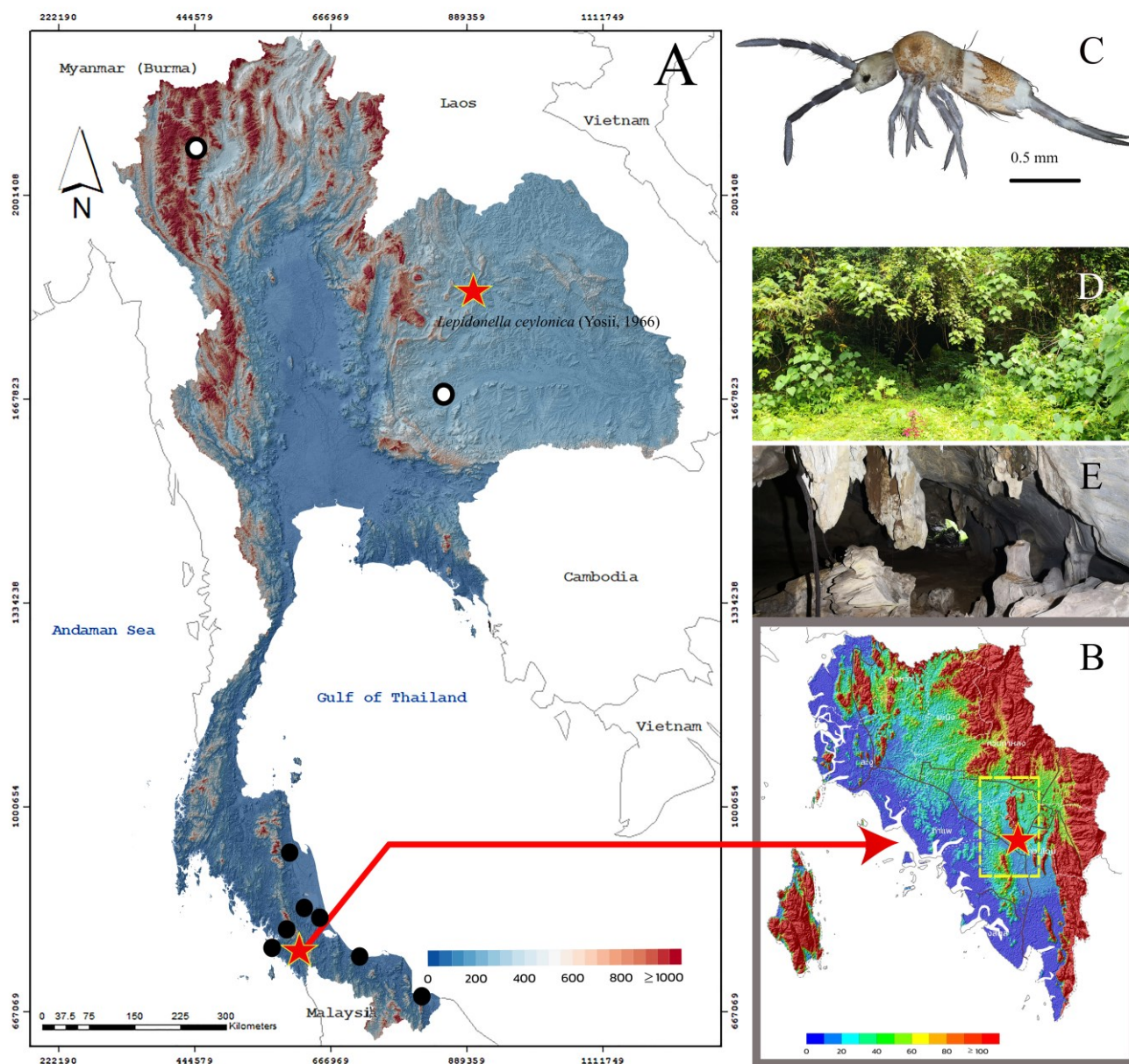


FIGURE 1. A. Distribution of *Lepidonella* species in Thailand shown in relation to topography and elevation. Red stars indicate the localities of the described species, *Lepidonella sirindhornae* sp. nov. and *L. ceylonica* (Yosii, 1966). Black circles represent localities where unidentified *Lepidonella* species have been collected from cave habitats in southern Thailand, while empty black circles indicate localities where unidentified *Lepidonella* species have been reported from forest habitats. B. Enlarged map of Satun Province showing the type locality of *L. sirindhornae* sp. nov. C. General habitus of *L. sirindhornae* sp. nov. D. Entrance of Tham Phraya Bangsa Cave, which is densely vegetated with branches, leaves, and shrubs. E. cave habitat where *L. sirindhornae* sp. nov. was collected.

and her significant contributions to the promotion of biodiversity conservation and environmental protection in Thailand, as well as to commemorate the occasion of her 70th birthday anniversary.

Description

Habitus (Figs 1, 2A, I, 3A).— Body length: 1.5–1.7 mm. Color: whitish in ethanol with orange dotted pigments on head, body and furca, and pale bluish behind eyepatches on antennae, lateral margins of

meso- and metathorax, and terminal region of Abd. IV and V (Fig. 1). Eyes 6+6, small, within a black ocular patch on each side (Figs 1, 2A, I). Extraocular structure sensu Mitra (1972) absent. Body slender, with elongate antennae, legs and furca. In lateral view, head down perpendicularly to the body. Body strongly bent and humped at the level of Th. II, straight backwards or slightly arched at the level of Abd. II (Figs 1, 2A). Th. II 1.5 times as long as Th. III; Abd. IV about 4 times longer than Abd. III (Figs 1, 2A, 4D).

TABLE 1. A comparative analysis is presented among cave-dwelling *Lepidonella* species recorded in Southeast Asia, including *L. lecongkietii* Deharveng & Bedos, 1995, *L. doveri* (Carpenter, 1933), and *L. sirindhornae* sp. nov. Key: c = ciliated chaetae, s = smooth chaetae. Character states indicated in parentheses were not reported in the original description.

Characters	<i>L. lecongkietii</i> Deharveng & Bedos, 1995	<i>L. doveri</i> (Carpenter, 1933)	<i>L. sirindhornae</i> Nilsai & Jantarit, sp. nov.
Location	Kien Giang, Vietnam	Selangor, Malaysia	Satun, Thailand
Body color	only sparse blue dots	Pale yellow with micro blue dots	Orange with light blue pigments
Body size (mm)	1.5–1.7	2.3–2.7	1.5–1.7
Antenna: head (mm)	3.5	3.7	3.5–5.1
Presence of scales on Ant. I and II.	absent	present	absent
Presence of spines on apical edge of labrum	?	absent	4
No. of hair on maxillary outer lobe	3	4	4
No. of mac on dorsal head and tergite	?	8–9+8–9	3+3
No. of An chaetae	?	4	3
No. of S chaetae	?	6	1
ms formula	?	1,0/1,0,1,0,0	1,0/1,0,1,0,0
Sens formula	?	1,0/0,1,1,1,?	1,0/0,1,1,1,3
Claw III length (µm)	?	50–60	40–45
Number of inner teeth of Unguis	2	0	2 (0)
Type of tenent hair	Clavate	Pointed	Clavate (pointed)
No. of eyes	8+8	3+3 with 2 or 3 eye patches	6+6
Labial basic formula	M1m2rel1l2	M1M2(R)EL1L2 or M1m2(R)EL1L2	M1m2rEL1L2 or (M1rEL1L2)
No. of central mac on Abd II.	?	0	1
No. of laterally mac on Abd III.	?	3	1
No. of central mac on Abd. IV	?	2	3
No. of Chaetae on the Cephalic groove	?	5–6c+5–6c	4c+4c
No. of anterior mac at VT	?	14 + 14	8 + 8
No. of posterior mes and mac at VT	?	37	31
Number of chaetae in lateral flap	?	12–13	11+11
The presence of filamentous organs	?	present	present
No. of trochanteral organs	?	17–21	20–25
No. of spines at internal row of dens	?	84–105	53–60
No. of spines at external row of dens	?	50–65	44–48
No. of mucronal teeth	4	4	4
Dens: Mucro ratio	20	20	19–21
Reference(s)	Deharveng and Bedos, 1995	Carpenter, 1933; Deharveng et al., 2018	This study

Pseudopores (Figs 2K, 3A, B, 4D).– Pseudopores present as round flat disks, larger than mac sockets on various parts of the body: antennae, head, tergites, coxae and furca (manubrium and dens). On antennae, psp located ventroapically between the tip of antennal segments and the chaetae of the apical row, or just below apical row of chaetae (absent or not detected on Ant. I, 3 on Ant. II and 2 on Ant. III). On head, 1 or 2 psp located externally on peri-antennal area, difficult to observe. On tergites, 1 + 1 psp close to the axis from Th. II to Abd. IV (Figs 3A, 4D), and a file of 4 conspicuous psp on Abd. IV along the suture with the anterior furcal subcoxa. Coxae I, II and III with 2– (3), 3– (4) and 1–2 psp respectively (Fig. 3B), located close to longitudinal rows of chaetae described below. On manubrium, two psp on each dorso-distal plaque, on dens, a line of 4 psp dorsally on the proximal third (Fig. 2K).

Scales.– Brownish, rounded, oval or truncate, striated, of variable size, adorned with many minute spicules in irregular lines. Scales present on both faces of head, thorax, abdomen, and ventral face of manubrium and dentes. All antenna segments, all leg segments, and ventral tube devoid of scales.

Antennae (Figs 1, 2F, 4A).– Antennae longer than the body, with an average length approximately 4 times the cephalic diagonal (range: 3.5–5.1; N = 4). Lengths of antennal segments I to IV in µm: 284–294/410–430/313–442/611–1,008 (N = 3) (Figs 1, 4A). Antennal segments entire, not sub-segmented or annulated; Antennae sometimes asymmetrical due to the fusion of Ant. III and IV, Ant. III distal chaetae strongly modified when Ant. III and IV fused. Ant. IV. not subdivided, without apical bulb; dorsoexternal sub-apical organite relatively large swollen, oval, slightly enlarged medially, inserted dorsally from the apex.

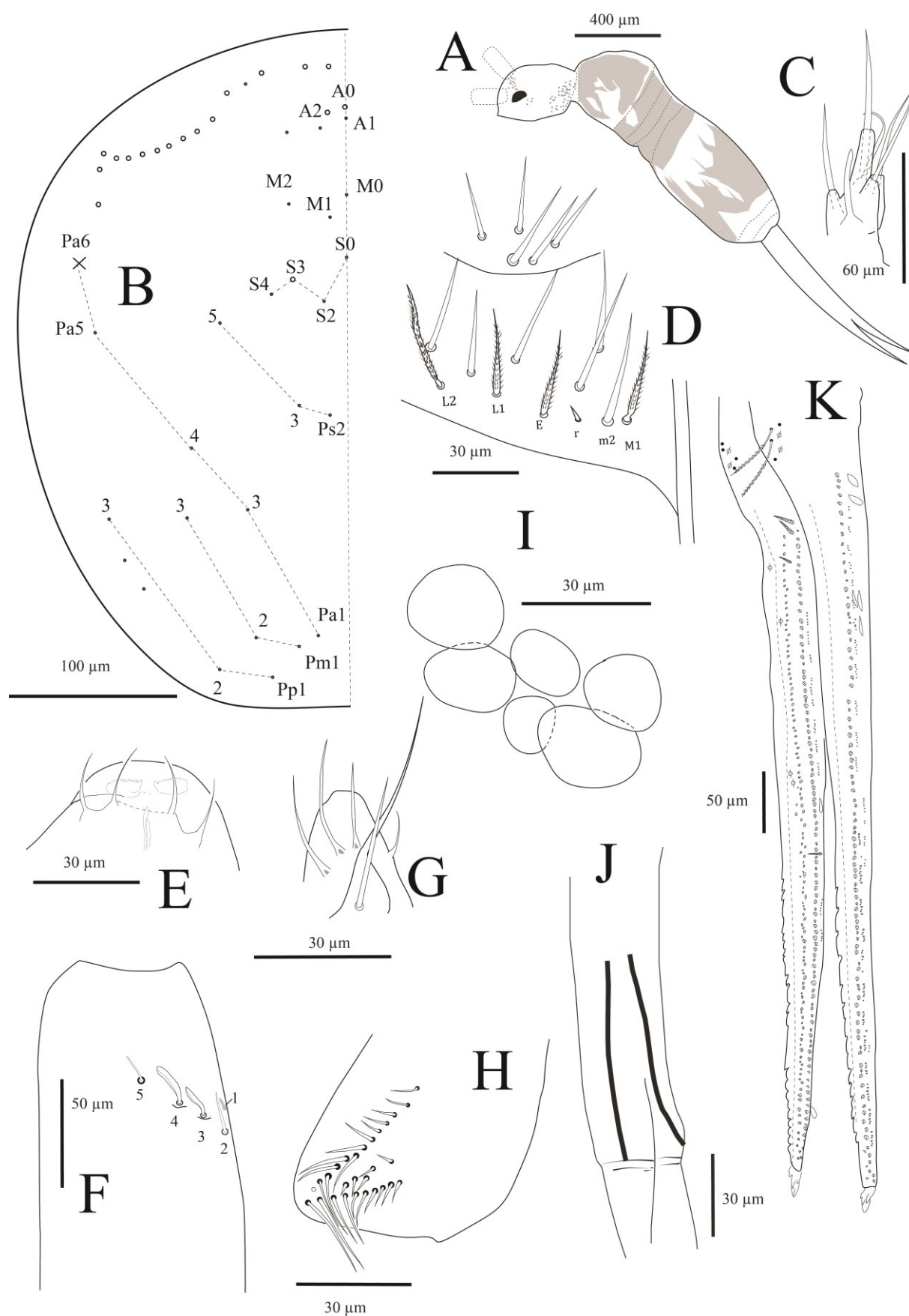


FIGURE 2. *Lepidonella sirindhornae* sp. nov. **A.** Habitus **B.** Dorsal head chaetotaxy, right side **C.** Labial palp **D.** Chaetae of labial basis **E.** The distal end of the labrum **F.** Ant. III organ, left side. **G.** Outer maxillary lobe **H.** Thochantheral organ **I.** Eyes **J.** Longitudinal structures on manubrium and **K.** Mucrodens and distal part of manubrium.

Antennal scales subequal, small (20–45 μm), oval, present dorsally on Ant. I and Ant. II, absent on Ant. III–IV. Other antennal chaetae of various types, arranged in a complex pattern rather similar to those described in Deharveng et al. (2018). Chaetal type morphology of antennae not analyzed in this work. Ant. III organ with typical 5 chaetae with two internal paddle-like chaetae in the middle (Fig. 2F).

Mouthparts (Fig. 2C–E, G).— Labral formula as 4/5, 5, 4; prelabral chaetae bent and ciliated, labial chaetae smooth and acuminate; labral chaetae of the distal row slightly shorter than those of the median and proximal row. Distal border of the apical non-granulated area of the labrum without a relatively narrow median intrusion into the granulated area dorsally; apical edge adorned with four long spines (Fig. 2E). Ventrodistal complex of labrum well differentiated, asymmetrical, with 2 distal multi-toothed combs and a pair of thin, sinuous, unequal tubules below (Fig. 2E). Outer maxillary lobe with 1 papillate chaeta, 1 basal chaeta and 4 sublobal hairs of subequal size of which the outer one is distinctly smaller than other three (Fig. 2G). Chaetae of labial basis as M1m2rEL1L2 (or M1rEL1 L2), r reduced to a short as pointed mic, ratio of r to M1 0.17–0.21; M1, m2, E, L1 and L2 subequal (Fig. 2D); Labial palp (*sensu* Fjellberg, 1999) with 5 papillae (A–E) surrounded by 13 guards chaetae (guard absent in A and C, present in B = 5, D = 4 and E = 4 with a lateral process and h = 2), and 5 proximal smooth chaetae (20 μm long). Lateral process of labial palp subcylindrical, thicker than normal chaetae, with tip not reaching the apex of labial papilla E (Fig. 2C). Mandible head strong, asymmetrical (left one with 4 teeth, right one with 5 teeth); molar plate with one strong pointed basal tooth, and 4–5 strong inner distal teeth, identical in both mandibles.

Dorsal head chaetotaxy (Fig. 2B).— Dorsal cephalic chaetotaxy with stable chaetae arrangement as in Fig. 2B. ‘A’ series with 2+2 mac (A0, A2), A1 as mic; ‘M’ series with 3+3 mic (M0–M2), sutural row with 4+4 mic (S0, S2, S3, S4) and post-sutural row with 3 mic (Ps2, 3 and 5). The posterior region with 4+4 mic in the Pa row (Pa1, 3–5) and 1+1 short cephalic tric (Pa6); 3+3 mic in the Pm row (Pm1–3) and 3+3 mic in the Pp row (Pp1–3). Ventral cephalic chaetotaxy with 4+4 weakly ciliated chaetae along cephalic groove.

Tergites

Dorsal body chaetotaxy (Figs 3A, C, 4D–F).— Tergite chaetae of six types as usual in the group (*sensu* Deharveng et al., 2018): ordinary chaetae of various

size, ciliated or serrated, modified mes of trichobothrial complexes, short S-chaetae (S and ms), S-like chaetae, trichobothria and scales. Tergite dense cover with round or oval scales, mixed with sparse, slightly serrated mes.

Trichobothrial pattern from head to abdomen IV as 1/0,0/0,2,3,2 by half tergite, accompanying by modified mes of triangular, strongly ciliated unilaterally.

S-chaetotaxy formulae from Th. II to Abd. V.— ms as 1,0/1,0,1,0,0; S as 1,?0/0,1,1,n?,3 (not clearly seen in our slides).

Body.— Chaetotaxy of the body as follows.

Th. II collar as a row of small mac on anterior part close to head, with 8 chaetae on middle and posterior regions as in Figure 3A: medial row with 3 mes (m4, m5, m6a); posterior row with 5 mesochaetae (p1, p2, p4?, p5, p6); 2+2 antero-lateral sens per side (S and ms), postero-lateral sens not detected.

Th. III without mac, with at least 10 chaetae (Fig. 3A): 2 anterior mes (a2, a7); 3 medial mes (m5, m6, m7); and 6 posterior mes (p1–p6), ms and S not seen.

Abd. I without mac, with 1 ms and 6 mes (a1, a3, a5, m2–4) (Fig. 3A).

Abd. II with 1 mac (m1) and 1 central mes (m3), and 2 trichobotria accompanied by modified fan-shaped chaetae, external trichobotria (a5) surrounded by 4–6 modified mes and internal trichobotria with 2–3 modified mes, 1 sensilla inserted internal to external trichobotria; with 6+6 mes (a2, a3, m3, m5, m6, m7) (Fig. 3A, C).

Abd. III with 1 central mac (m5), and 3 trichobotria (1 internal and 2 external tric) accompanied by modified mes (Figs 3E, 4D), 1 sensilla inserted external to internal trichobotrium. At least 11+11 mes with 1 sensilla (ms) close to postero-external tric area; lateral chaetae am6, pm6 and p6 as mes. Presence of 25–30 filamentous organs ($\approx 220 \mu\text{m}$ long) on each side of Abd. III at lower part of Abd. III, mostly fallen on our slides.

Abd. IV with 3+3 central mac (B3, B5, B6), and 2 trichobotria accompanied by modified mes, 3+3 mes or small mac (D3, D3p, T7) and 1 postero-lateral sensilla; anterior trichobotria devoid of modified mes, posterior trichobotria surrounded by 2–4 modified mes, and at least 2+2 thin long smooth S-like chaetae anterior to psp (Fig. 4D, F).

Abd. V with 3 sens mixed with several mes to mac chaetae (Fig. 4D).

Abd. VI chaetotaxy not analyzed.

Legs (Figs 2H, 3B, D, E).— Legs devoid of scales, covered with ordinary ciliated chaetae of various length, from mes to mac. Tita of leg III long, tita of

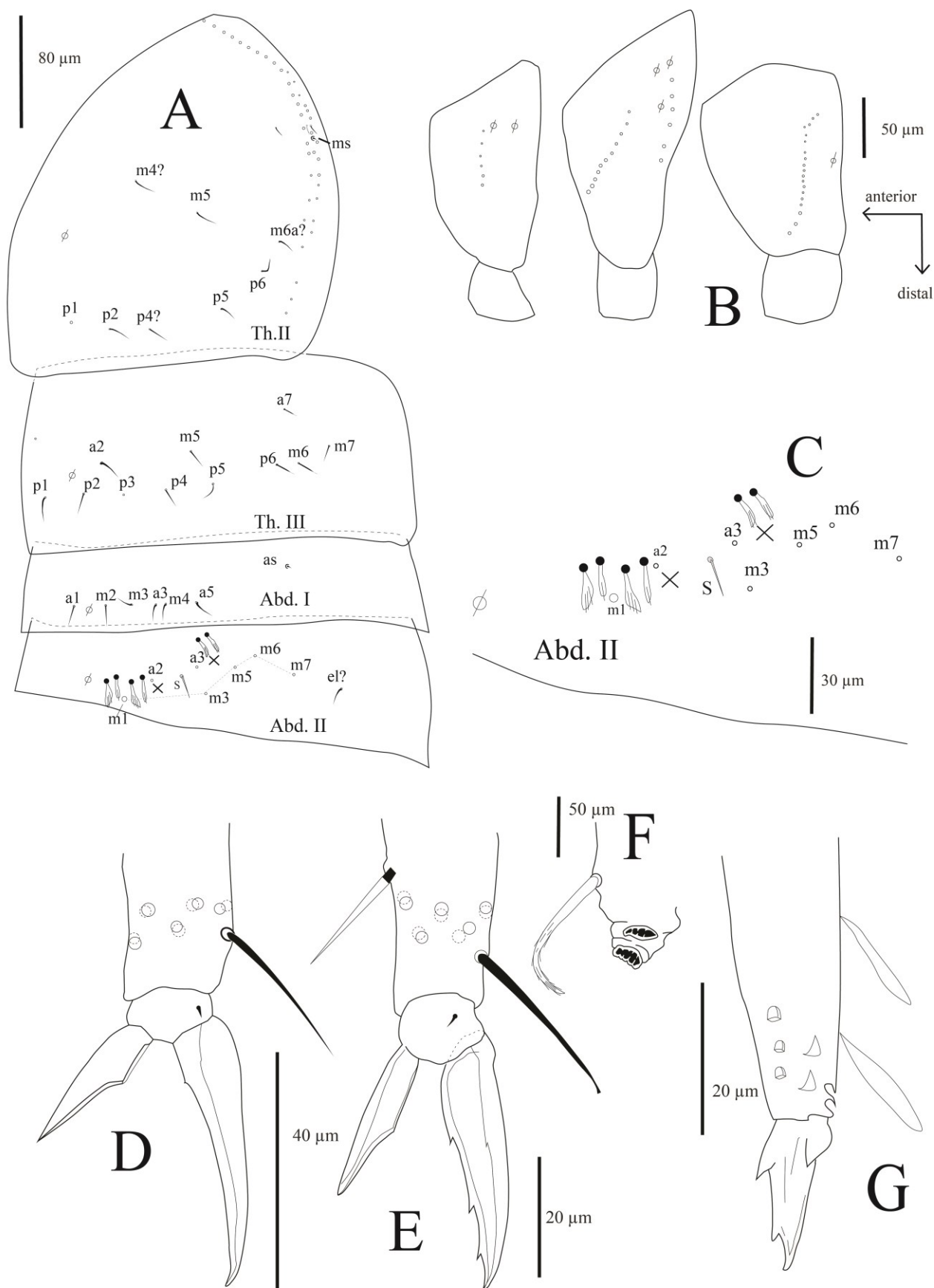


FIGURE 3. *Lepidonella sirindhornae* sp. nov. continued. **A.** Dorsal chaetotaxy of Th. II–Abd. II **B.** Pseudopores and chaetae sockets on Coxa I–III **C.** Trichobothrial complexes of Abd. II. **D.** Claw II **E.** Claw III **F.** Tenaculum and **G.** Mucro.

legs I and II slightly shorter. Coxal formula from leg I to leg III: 6/2psp, 17/3 psp, 16–19/1–2psp (longitudinal row of mac and psp) (Fig. 3B). Trochanteral organ of leg III with 25–28 smooth, straight, unequal spiny chaetae (Fig. 2H). Tita densely covered of ciliated-serrated mes with strong, slightly sinusoidal ventral mes, thicker disto-ventrally, thinner disto- dorsally (a dorsal row of mic not detected). Distal row of leg III with 10 ciliated subequal mes and a thin, usually clavate dorso-apical tenent hair (25–35 μm long) (6 individuals with clavate tenent hair, 2 individuals with pointed tenent hair (Fig. 3E) (tenent hair of leg I and II always pointed (Fig. 3D); a ventro-distal thick, smooth, erected chaeta present on Tita III (18–22 μm long) (Fig. 3E). Pretarsal mic minute (2.5–3 μm). Unguis of leg III slender and rather long (40–45 μm long, 8–10 μm wide at basis) (N=6), with a pair of unequal minute inner basal teeth, inner edge with two teeth at 60% and 80% (Fig. 3E). Empodial appendage thick, rather elongated, lanceolate, about 3/5 as long as inner edge of claw, slightly swollen baso-internally, pointed apically, with a sharp inner edge at its haft, external edge smooth (Fig. 3E). Unguis of leg III of two specimens slender and rather long (45–55 μm long, 7–8 μm wide at basis), with a pair of unequal minute inner basal teeth, inner edge without teeth) and empodial rather elongated, lanceolate, about 2/4 as long as inner edge of claw (Fig. 3D). Unguis of leg I and II with a minute inner basal tooth (Fig. 3D).

Ventral tube (Fig. 4B, C).– VT about four times longer than its width; lateral flaps with 11+11 chaetae (7+7 smooth distal, one longer than others; 4+4 ciliated more proximally) (Fig. 4B); anterior face of VT with 8+8 chaetae, all ciliated-serrated mes, with 2+2 mac distally (Fig. 4C); posterior face of VT with at least 29 serrated mes or small mac, and 1+1 smooth, straight mac distally (Fig. 2B)

Furca (Figs 2G, J, K, 3F).–

Tenaculum with 4 large teeth of decreasing size from the basal to the distal one on each ramus, on a prominent, irregular body, with a postero-basal strong, densely serrated, distally bent chaeta (Fig. 3F).

Furca with chaetae of 3 types: scales, ciliated chaetae and spines (Fig. 3F).

Scales of the furca small to medium-size, oval-ogival to rounded (15–50 μm long) or elongated (15–30 μm long), densely covered by minute spinules, without ridges (Fig. 2G, K).

Ordinary ciliated chaetae from mes to mac present dorsally. Spines as described below.

Manubrium dorsally covered by subequal ciliated and rather thin chaetae (40–70 μm long), thicker and

longer distally, with a median glabrous streak and a line of stronger dorso-lateral mac. Dorso-distal plaque with 4+4 mes and 2+2 pseudopores. Ventrally entirely and densely cover with oval to rounded scaled, except 2+2 thick ciliated centro-apical mes. Inside the manubrium, two thin, straight, longitudinal structures running from its apex (Fig. 2J).

Mucro and dens about 1.2–1.3 times longer than manubrium. Dens straight, slightly and progressively tapering, ventrally entirely and densely covered with elongated scales, dorso-laterally with 2 rows of spines throughout, and ciliated chaetae dorsally between these rows. Scales grouped in interrupted lines made of 3–5 multiplies on the distal 2/3 of the dens, irregularly arranged on the 1/3 proximal. Spines strong, pointed, swollen, serrated or ridged (18–22 μm long), the dorso-internal row with 53–60 spines, and 44–48 in the dorso-external row. Spines of different size interspersed along each row (often one larger, one smaller, one larger), those of external row larger, less sclerotized than those of internal row; short and long ciliated mes present dorsally between the two rows of spines, arranged in two rows distally. In the 1/3 dorso-lateral side of dens, a row of 4 pseudopores (Fig. 2K). Mucro very short, about 19–21 times shorter than dens, separated from dens, sclerotized, short (shorter than distal mac), triangular, with 4 small teeth, the basal one strong, the two antero-distal ones (one thick and another one rather thin) and a minute apical one acuminate, rather bent apically, easily broken.

Genital plate.– Female with 2+2 smooth mic, 1 pair on anterior and posterior lobes. Male with 20–22 smooth, short, acuminate circumgenital mes, without modified chaetae, mics not clearly seen in the materials.

Ecology.– A small population of the species was collected in the big chamber near the cave entrance and within the twilight zone and dark zone of this cave, in areas where small accumulations of bat guano (from insectivorous bats) were present. Specimens were found in a moist, humid microhabitat, including areas near a water pool, on rock surfaces, stalagmites, and the cave floor. In this cave, at least five described species of Collembola have been identified: *Xenylla yucatana* Mills, 1938, *Folsomina onychiurina* Denis, 1931, *Coecobrya polychaeta* Zhang & Nilsai, 2017 *Acrocryptus* cf. *carosus gentingensis* Yoshii, 1982, and *Cyphoderopsis* cf. *phangnga* Jantarit, Deharveng & Satasook, 2013 (Nilsai et al., 2017; Jantarit and Ellis, 2023). In addition, four putatively undescribed species have also been recorded, namely *Lepidocyrtus* sp., *Isotomiella* sp., *Cyphoderus* sp. 1, and *Pararrhopalites*

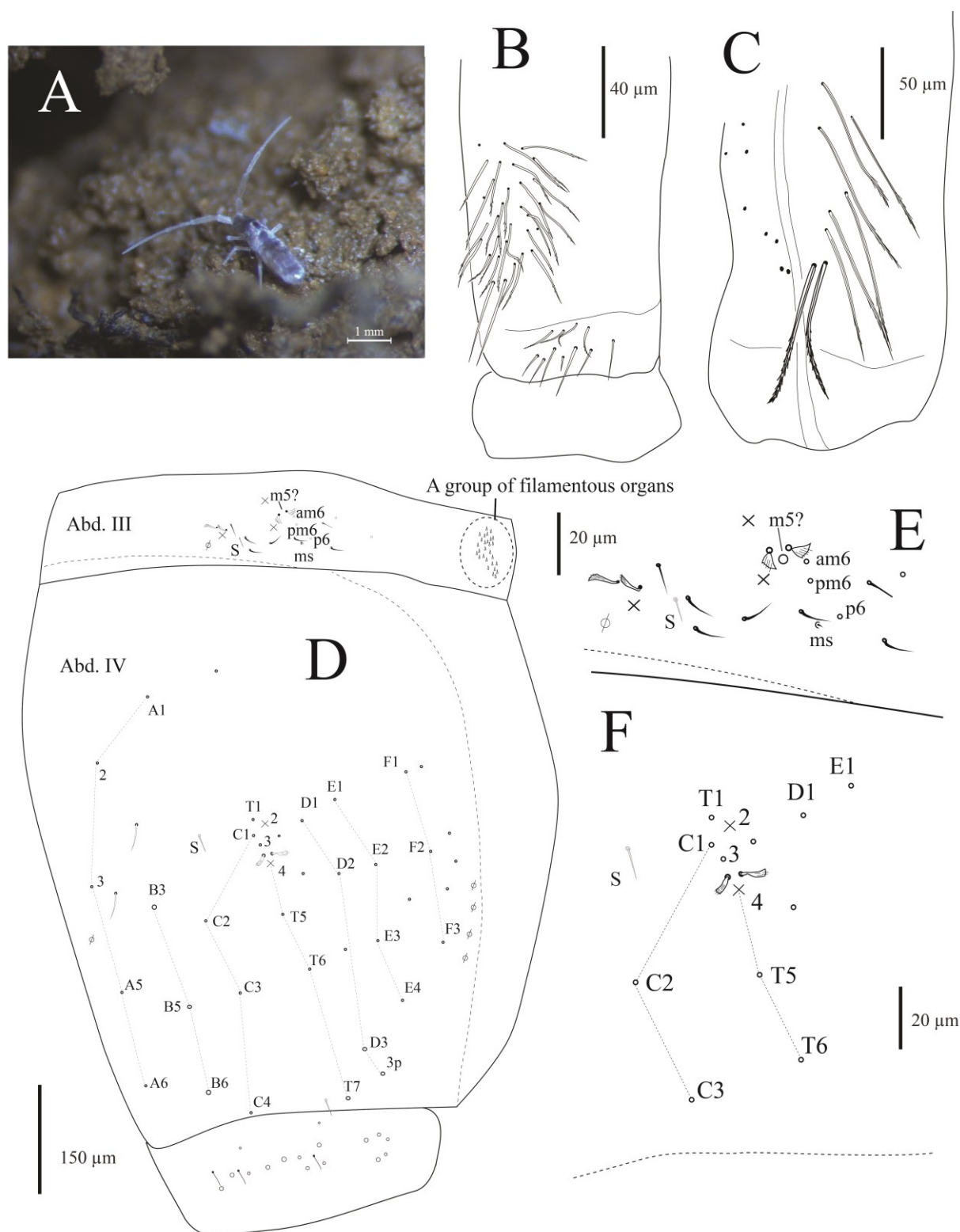


FIGURE 4. *Lepidonella sirindhornae* sp. nov. continued. **A.** Habitus *in situ* **B.** Posterior side of ventral tube **C.** Anterior side of ventral tube **D.** Dorsal chaetotaxy of Abd. III–Abd. IV **E.** Trichobothrial complexes of Abd. III and **F.** Trichobothrial complexes of Abd. IV.

sp. 2 (Nilsai, 2018). The cave measures 158 meters in length, with an entrance 7 meters wide and 4 meters high. A minor subterranean stream occurs within the cave, flowing outward but becoming dry during the dry season. The physical parameters in the cave showed temperature ranging from 24.1 to 26.9 °C, relative humidity from 87% to 99%, and CO₂ concentration from 748 to 1,039 ppm.

Remarks.— *Lepidonella sirindhornae* sp. nov. exhibits morphological similarities with *L. lecongkiet* Deharveng & Bedos, 1995, a cave-dwelling species from Kien Giang, Vietnam, and *L. doveri*, a cave species from Selangor, Malaysia. They share several common morphological traits, including the presence of bluish dots, the length of antennae (approximately 3.5 times). However, *L. sirindhornae* sp. nov. can be readily distinguished from these two congeners. *Lepidonella sirindhornae* sp. nov. differs from *L. lecongkiet* Deharveng & Bedos, 1995 by the following combination of diagnostic characters: relatively greater antennal-to-head length ratio (3.5–5.1); no. of hair on maxillary outer lobe (4 vs. 3), number of eyes (6+6 vs. 8+8); and labial chaetotaxy formula (M1m2rEL1L2 vs. M1m2rel 112). Moreover, *L. sirindhornae* sp. nov. can be distinguished from *L. doveri* (Carpenter, 1933) by the following characters: number of An chaetae on dorsal head (3 vs. 4); number of S chaetae on head (1 vs. 6); number of anterior macrochaetae on the VT (8+8 vs. 14+14); number of chaetae on lateral flaps on the VT (11 vs. 12–13); trochanteral organ with 20–25 chaetae; and a high number of chaetae (31) on the posterior face of the VT. A comparative summary of diagnostic characters for *L. sirindhornae* sp. nov. and the other two morphologically similar cave-dwelling species is provided in Table 1.

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