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Three new species in the genus *Latouchia* Pocock, 1901 (Araneae, Mygalomorphae, Halonoproctidae) from Vietnam

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Abstract: The current taxonomy of the trapdoor spider genus *Latouchia* is discussed, and three new species are described from southern Vietnam. *Latouchia stridulans* sp. nov. and *L. schwendingeri* sp. nov. are described from both sexes, *L. huberi* sp. nov. is described from females only. Significant morphological difference between the first species and the second two species indicates that *Latouchia* may need to be split into two or more genera when more information becomes available.

Keywords: Taxonomy - Southeast Asia - Ummidiinae - Rastelloidina - trapdoor spiders.

INTRODUCTION

Godwin *et al.* (2018) recently transferred the genus *Latouchia* Pocock, 1901 from the family Ctenizidae Thorell, 1887 (subfamily Ctenizinae) to the family Halonoproctidae Pocock, 1901 (subfamily Ummidiinae). Three genera (*Ummidia*, *Conothele*, *Latouchia*) are currently included in Ummidiinae, with *Latouchia* as the presumed sister genus of a clade containing the genera *Ummidia* plus *Conothele* (Godwin *et al*., 2018).
Latouchia is taxonomically not well defined and the type specimen(s) appear to be lost (see section "Taxonomy" below). Here the current state of taxonomy of the genus *Latouchia* is discussed and three new species, found in Vietnam, whose type specimens are deposited in the collection of the Natural History Museum of Geneva (MHNG), are described and named.

MATERIAL AND METHODS

Measuring methods: Morphometric measurements of body parts, eyes, legs and palps were taken as indicated in Figs 1-6. Total lengths of legs and palps are given as the sum of length measurements of individual segments (e.g. length of tarsus + metatarsus + tibia + patella + femur). Measurements taken at lower magnifications (legs, larger body parts) are given to an accuracy of 0.1 mm, measurements taken at higher magnifications (eyes, copulatory organs) are accurate to 0.01 mm.

Sample description: The available spider material consists of eleven *Latouchia* specimens in three museum samples, collected at three different localities (Mui Nai Beach, Hang Tien and Dambri Waterfall) in southern Vietnam. Because each sample contained more than one specimen (MHNG sample numbers, see Table 1), each individual specimen was given a unique identification number (ID-numbers, see Table 1). This allowed a study of species unity and individual variation. The descriptions of colouration refers to observations made on specimens fully submerged in 70% ethanol.

Illustrations of copulatory organs: Because of its asymmetrical structure, the male bulb (= palpal organ) is shown in four different views, as rotated around its longitudinal axis (see Figs 19-26). The drawings are made from the detached right bulb of the specimen described. The female spermathecae are shown in ventral view, after having removed the covering cuticle and the fatty tissue and gland tissue around the receptacles with fine sharp tools (see Figs 18, 38-39, 46-47). The receptacles were left in situ.

Equipment: All specimens were examined with the aid of a Huvitz HSZ-645TR stereomicroscope equipped with a Lusis HC-20CU camera. Morphological details were studied using a Euromex iScoop compact microscope equipped with a CMX-500 camera. Both systems allow multiple focus stacking and precision measurement.

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Table 1. Summary of available samples with individual codes, museum codes, localities, sex and size indications for individual specimens.

Individual specimen ID	MHNG sample number	Localities	Sex and size
PS-018	SV-03/04	Mui Nai Beach	Female, CL = 5.0 mm
PS-019	SV-03/04	Mui Nai Beach	Female, CL = 5.3 mm
PS-020	SV-03/04	Mui Nai Beach	Female, CL = 6.2 mm
PS-021	SV-03/04	Mui Nai Beach	Juvenile, CL = 6.2 mm
PS-023	SV-03/04	Mui Nai Beach	Female, CL = 5.6 mm
PS-024	SV-03/04	Mui Nai Beach	Juvenile, CL = 4.1 mm
PS-022	SV-03/05	Hang Tien	Male, CL = 3.9 mm
PS-016	SV-03/05	Hang Tien	Female, CL = 4.2 mm
PS-017	SV-03/05	Hang Tien	Female, CL = 4.3 mm
PS-014	SV-03/18	Dambri Waterfall	Male, CL = 6.9 mm
PS-015	SV-03/18	Dambri Waterfall	Female, CL = 7.5 mm

Drawings were made directly from the specimens using a Ceti Medo II stereomicroscope with a drawing tube.

Abbreviations: See also Figs 1-6; AR = anterior eye row width; BuL = length of bulb (in dorsal view); BuW = width of bulb (in dorsal view); CL = carapace length; CP = length of cephalic part of carapace; CW = carapace width; dALE = diameter of anterior lateral eye; dAME = diameter of anterior median eye; diAME = distance between anterior median eyes; diPME = distance between posterior median eyes; dPLE = diameter of posterior lateral eye; dPME = diameter of posterior median eye; EL = eye group length; EmL = length of embolus; Ext = external distance between receptacles; Int = internal distance between receptacles; LL = labium length; LL1 = length of first leg; LL2 = length of second leg; LL3 = length of third leg; LL4 = length of fourth leg; LW = labium width; MaxL = maxilla length; PaL = palp length; PFe = length of palp femur; PLS = posterior lateral spinnerets; PMS = posterior median spinnerets; PR = posterior eye row width; PTi = length of palp tibia; SL = sternum length; SW = sternum width; TBL = total body length.

Museum acronyms: MHNG = Natural History Museum, Geneva; MNHN = Natural History Museum, Paris.

TAXONOMIC PART

Latouchia Pocock, 1901

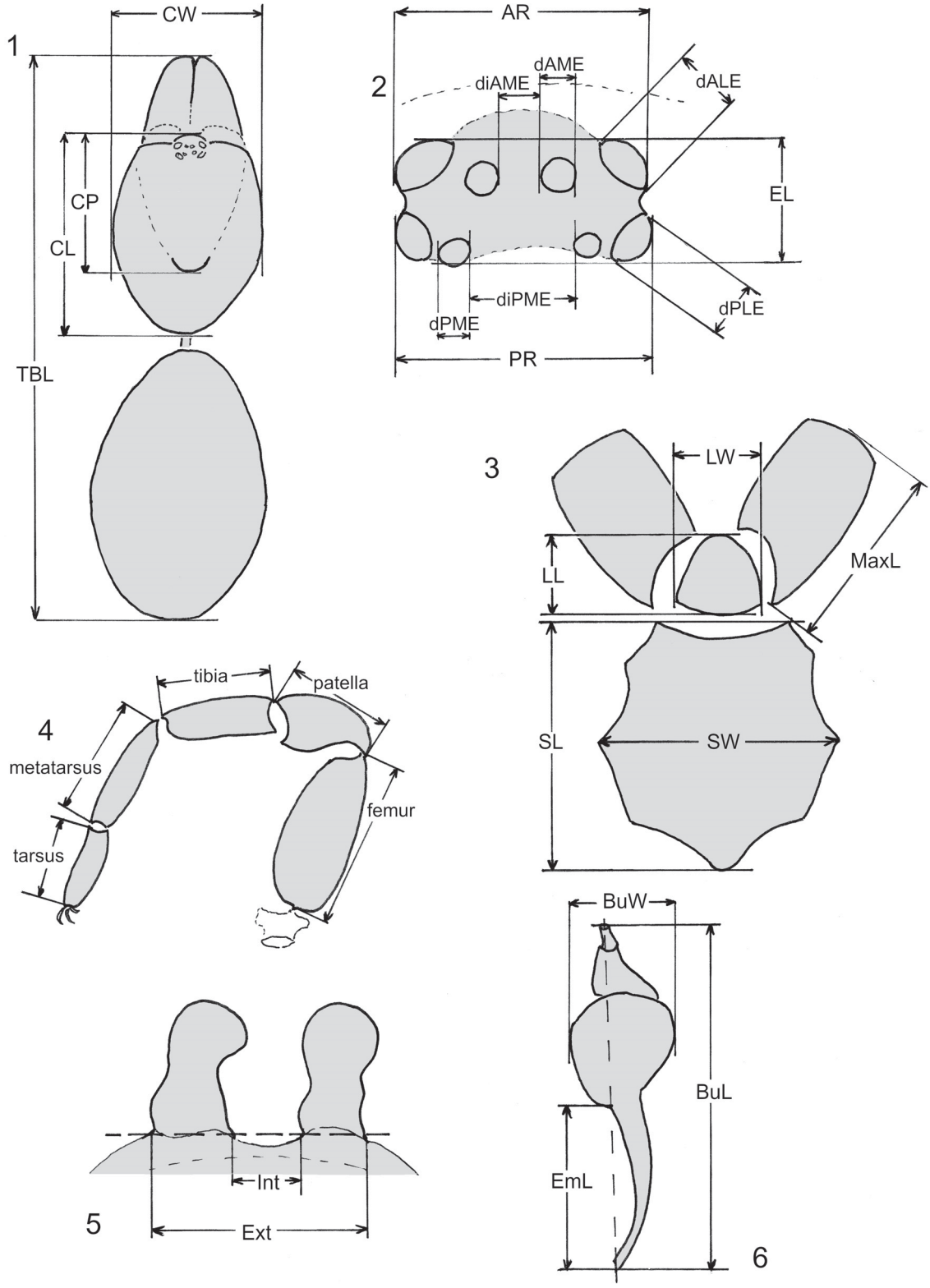
Latouchia Pocock, 1901: 210; established to accommodate three species previously misplaced by Simon (1886: 162-163 and 1897: 253) in *Acattyma* (= *Antrodiaetus*) plus two additional species from China and Japan.

Cronenbergella Charitonov, 1946: 19, see Raven (1985: 151).

Diagnosis: The genus *Latouchia* differs from other Ummidiinae by the absence of a proximal 'saddle-shaped depression' in the dorsal side of tibia III and by the absence of a protuberant, prodorsal apophysis (spur) on trochanter III (see Decae, 2010: fig. 1). As presently understood, *Latouchia* is the only rastelloid trapdoor spider genus without a saddle-shaped depression in tibia III but with clavate tarsal trichobothria.

Taxonomic and geographic remarks: Pocock (1901: 210-211) regarded *Latouchia* as closely related to *Cytrocatenum* (family Ctenizidae, sub-family Ctenizinae). He correctly described *Latouchia* as a trapdoor spider genus with typical rastelloid characters such as being strongly built, having a high elevated cephalic part of the carapace in females, a deep and strongly procurved fovea in both sexes, large orthognathous chelicerae, two pairs of short spinnerets, and the proximal segments of the PLS wider than long. Some characters in Pocock's description (a high ocular tubercle and sigilla fused to form a shallow Λ-shaped groove in the middle of the sternum), however, are not found in the Ctenizinae as they are understood today. These characters, combined with those mentioned by Pocock, place *Latouchia* within the Ummidiinae (family Halonoproctidae). The absence of lateral sigilla and the presence of clavate tarsal trichobothria (not mentioned by Pocock), further support the placement of *Latouchia* within the Ummidiinae on morphological grounds. Godwin *et al.* (2018: 308) confirmed this placement using morphological and molecular arguments. *Latouchia*, as understood here, is the only umminiine genus lacking the conspicuous saddle-shaped depression in tibia III (see diagnosis).

Although seventeen *Latouchia* species (and one subspecies) are regarded as valid in the World Spider Catalog (2019), the genus is relatively poorly known.



Figs 1-6. Explanation of measurements of in *Latouchia*. (1) Dorsal habitus: CL = carapace length; CP = length of cephalic part of carapace; CW = carapace width; TBL = total body length. (2) Eye group: AR = anterior eye row width; dALE = diameter of anterior lateral eye; dAME = diameter of anterior median eye; diAME = distance between anterior median eyes; diPME = distance between posterior median eyes; dPLE = diameter of posterior lateral eye; dPME = diameter of posterior median eye; EL = eye group length; PR = posterior eye row width. (3) Ventral side of cephalothorax: LL = labium length; LW = labium width; MaxL = maxilla length; SL = sternum length; SW = sternum width. (4) Measurements of segments of palps and legs. (5) Spermathecae: Ext = external distance between receptacles; Int = internal distance between receptacles. (6) Bulb: BuL = length of bulb (in dorsal view); BuW = width of bulb (in dorsal view); EmL = length of embolus.

Several species are briefly or incompletely described. Only eight *Latouchia* species have both sexes described. Eight other species are known exclusively from females, and one species from the male only. Nine species have no more than one reference in the literature, six of these single references are more than fifty years old. The existence of all these single-reference-species remains to be confirmed.

Another complication in the taxonomy of *Latouchia* is that the three earliest recorded species, all described by Simon (1886, 1897), had originally been misplaced in the genus *Acattyma* (L. Koch, 1878). Pocock (1901) recognized that Simon's *A. davidi*, *A. cunicularia* and *A. cryptica* had been misplaced and he therefore established the genus *Latouchia* to contain Simon's *Acattyma* species as well as two newly discovered species. Simon (1903: 890) acknowledged Pocock's new genus and the transfer of his *Acattyma* species to *Latouchia*. Pocock (1901) described two additional species, *L. fossoria* from China and *L. swinhoei* from Japan, and he designated *L. fossoria* as the type species of the genus *Latouchia* (Pocock, 1901: 211). This designation, however, is not recognized in the current version of the World Spider Catalog (2019), where *L. davidi* (Simon, 1886) (one of the two earliest described species) is given as the type species of *Latouchia*. This ambiguous information leads to further taxonomical complications, firstly because the holotype of *L. davidi* might be lost, and secondly because the type locality given by Simon (1886: 163) is difficult to trace. According to geographical information given in the World Spider Catalog (2019), *L. davidi* occurs in China. However, the type locality given by Simon (1886: 163), "Mou-Pin", might refer to "Khong Mou Pin" (22.483°N, 103.317°E) in northern Vietnam. Given the above, information about *Latouchia* provided in the World Spider Catalog (2019) needs correction. *Latouchia fossoria* should be indicated as type species of the genus, and the geographical origin of *L. davidi* should be indicated as eastern Asia. The question if Simon's *Acattyma davidi*, *A. cunicularia* and *A. cryptica* were correctly transferred to *Latouchia* remains open until the type specimen of these species have been recovered.

***Latouchia stridulans* sp. nov.**

Figs 7-22, 48-49

Types: MHNG, sample SV-03/18; male holotype (ID: PS-014; matured on 1.XI.2004), one female paratype (ID: PS-015); Vietnam, Lam Dong Province, Dambri Waterfall, ca 18 km north of Bao Loc; WGS84 11.6450, 107.7435; alt. 850 m, old secondary forest, roadside; 2.09.2003; leg. P. J. Schwendinger.

Etymology: The species name, a Latinised present participle, refers to the presence of a conspicuous and supposedly diagnostic series of crescent-shaped ridges on the retrolateral side of the basal segment of the chelicerae, here interpreted as part of a stridulatory organ.

Diagnosis: This species is distinguished from all known *Latouchia* species, for which sufficient information is available, by the presence of a series of crescent-shaped ridges (presumably part of astridulatory organ) on the retrolateral side of the basal segment of the chelicerae (Fig. 11). This character is present in both sexes. The new species furthermore differs from other *Latouchia* species in the morphology of the spermathecae, which are only slightly constricted in the distal half of both parallel receptacles (Fig. 18), and in the long, slender and regularly curved embolus with a small, subapical triangular side tooth (Figs 19-22).

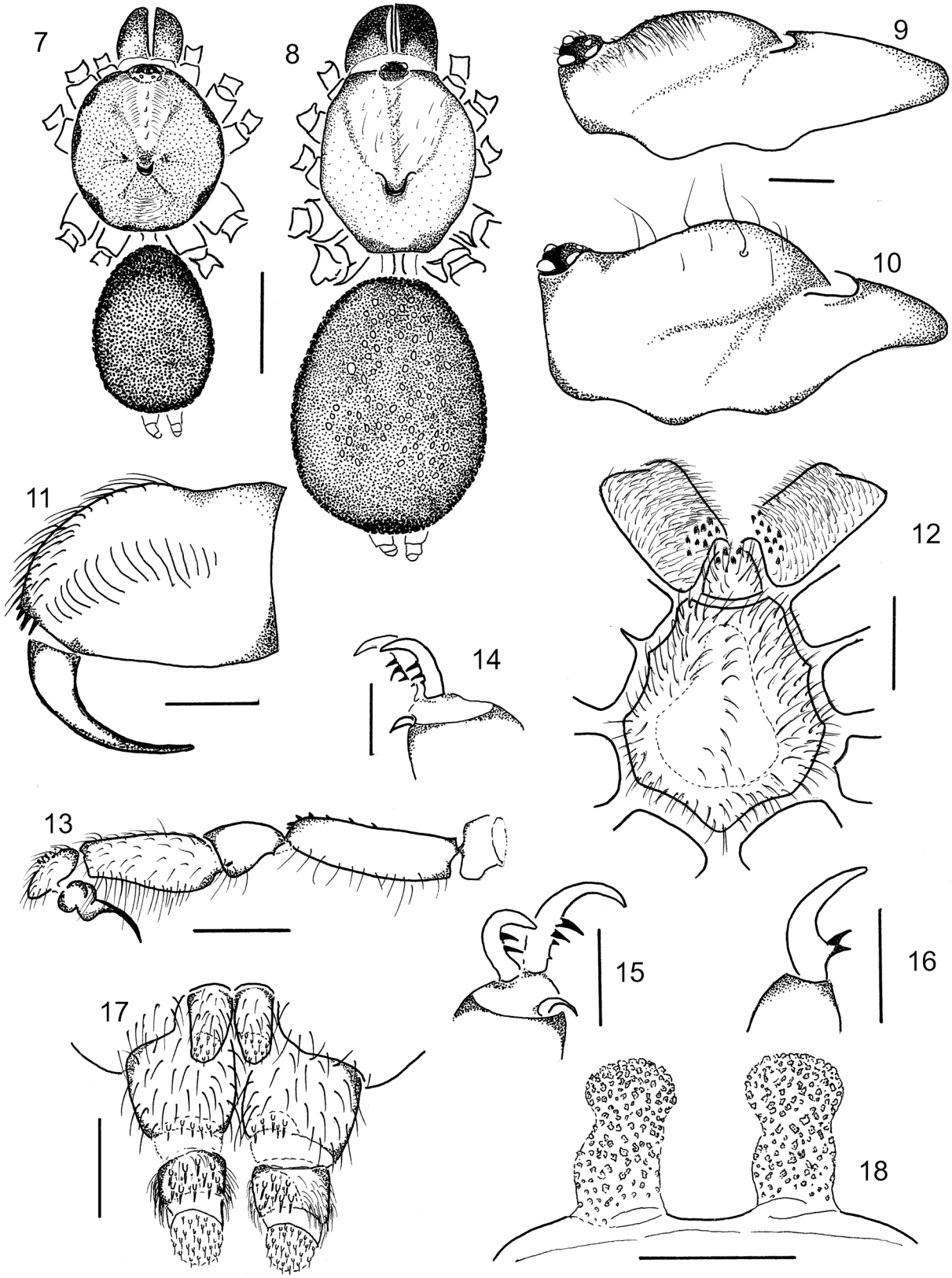
Description of male (holotype)

Colouration: Carapace uniformly dull dark brown with some shading, darkest along the edges. Chelicerae distinctly bicoloured, ventrally and proximally yellow, distally brown. Abdomen dorsally uniformly blackish grey, ventrally creamy yellow with numerous dark blotches between posterior booklungs and spinnerets. Sternum, labium, maxillae and ventral side of leg coxae yellow. Spinnerets creamy white. Distal segments of legs and palps yellow, proximal segments brown, femora entirely dark brown in palps and legs I-II, only dorsally brown in legs III-IV.

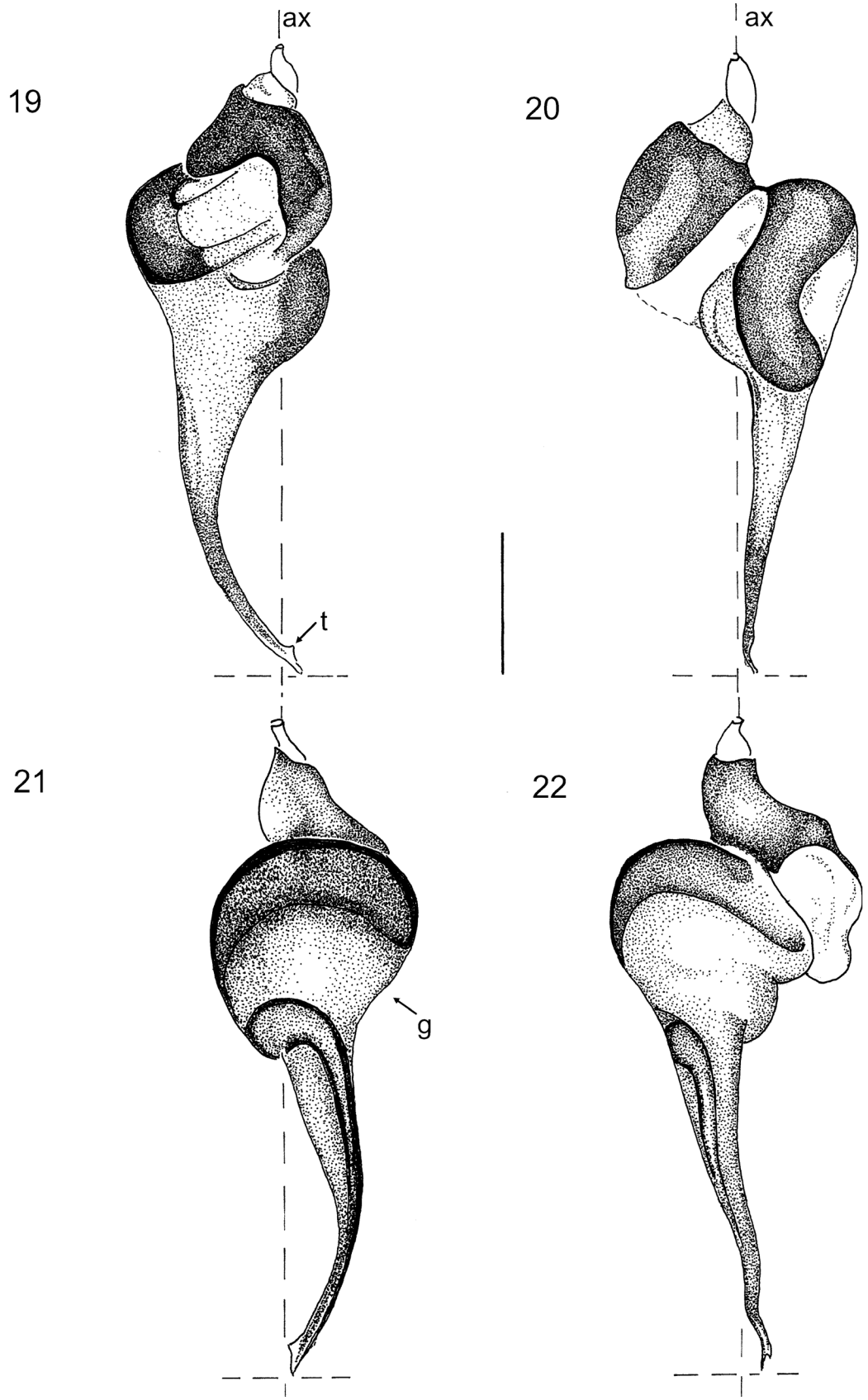
Carapace (Figs 7, 9): Slightly longer than wide (w/l = 0.9), with thickened rim around lateral and posterior edges, cuticle coriaceous (terminology following Pocock, 1901), with fine grainy texture and wrinkles between eyes and fovea, glabrous except for few fine bristles on cephalic part. Cephalic part slightly elevated (Fig. 9), rising gradually from eye group before sloping in a regular curve down to fovea. Fovea procurved, crescent-shaped. Thoracic part gradually descending from fovea to posterior edge of carapace (Fig. 9). Clypeus very narrow, hidden under forward-projecting ocular mound. Eye group on elevated mound (Fig. 9), almost twice as wide as long (EL/PR = 0.55), slightly trapezoidal, PR slightly wider than AR (AR/PR = 1.03); lateral eyes larger than median eyes. AME less than their diameter apart, anterior eyes grey, posterior eyes pearly white.

Chelicerae: Retrolateral series of distinct regularly-spaced, crescent-shaped ridges and depressions over the length of the basal segment forming the rasp of a stridulatory organ (Fig. 11). Dorsally glabrous zone separating longitudinal bands with fine bristles, these distally merging into a field of stronger bristles and apical rastellar teeth. Rastellum on small elevation. Ventral fang groove lined on both sides with rows of small conical teeth (five in prolateral row, four in retrolateral row). Fang long and sharply pointed (Fig. 11).

Ventral side of cephalothorax: Sternum slightly longer than wide (w/l = 0.9), narrowing anteriorly, widest between coxae II and III. Central sigilla large, fused, extending forward, with a single, longitudinal, median



Figs 7-18. *Latouchia stridulans* sp. nov. (7) Dorsal habitus of male holotype (ID: PS-014). (8) Dorsal habitus of male paratype (ID: PS-015). (9) Lateral view of carapace of male. (10) Idem, of female. (11) Left chelicera in retrolateral view (note stridulatory ridges). (12) Ventral side of cephalothorax of female (note fused central sigilla with central longitudinal row of bristles). (13) Left palp of male in retrolateral view. (14) Tarsal claws of leg I of male. (15) Tarsal claws of leg I of female. (16) Palp claw of female (note bifid tooth). (17) Spinnerets of female in ventral view. (18) Spermathecae in ventral view. Scale lines with number of millimetres between parentheses: Figs 7-10 (5); Figs 12-13 17 (2); Fig. 11 (1); Figs 14-16, 18 (0.5).



Figs 19-22. *Latouchia stridulans* sp. nov., male holotype (ID: PS-014), bulb with rotation axis (ax) indicated by broken line. (19) Ventral view (t = triangular tooth). (20) Retolateral view. (21) Dorsal view (g = globular part of bulb). (22) Prolateral view. Scale line 0.5 mm.

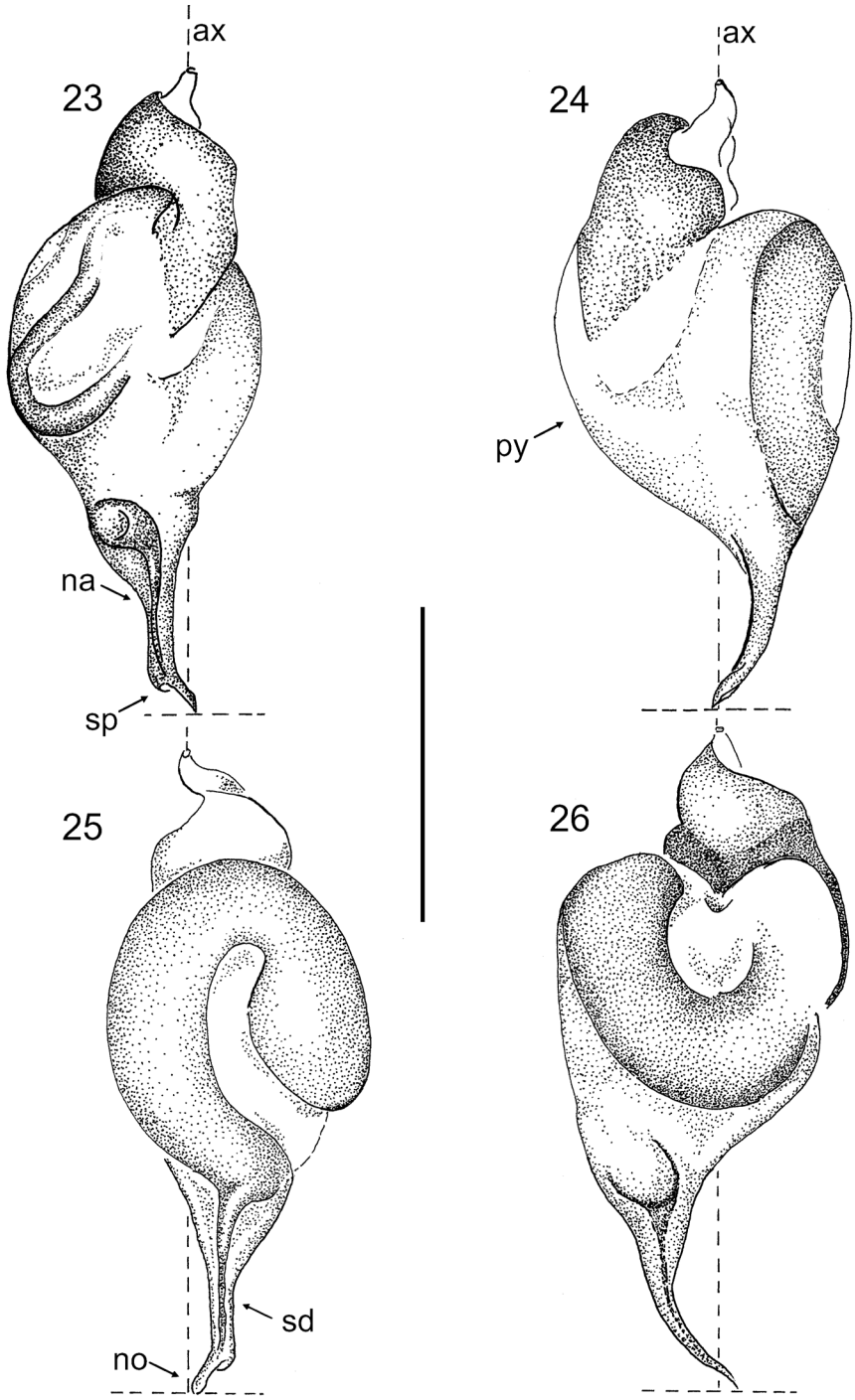
row of fine bristles. Labium semicone-shaped, truncated at anterior margin, wider than long (w/l = 1.2). A single apical cuspule present. Maxillae longer than wide, roughly rectangular, distal prolateral heel absent, group of small cuspules present along proximal edge.
Palps (Fig. 13): Cymbium spineless, with dorsal groups of 11 to 13 clavate trichobothria. Tibia proximally slightly inflated, with dense ventral group of strong bristles over full length of segment. Femur with small but distinct group of curved, short, thorn-like spines dorso-distally. Tibia and femur not longer than half length of carapace (PTi/CL = 0.4; PFe/CL = 0.5). Bulb (Figs 19-22) with proximal part globular in dorsal view (Fig. 21), clearly separated into a proximal and a distal part in pro- and retrolateral view (Figs 20, 22). Embolus long, nearly half length of total bulb (EmL/BuL = 0.48), regularly curved (best seen in ventral and dorsal view (Figs 19, 21), subapically with a distinct triangular "tooth" visible only in ventral and dorsal view (Figs 19, 21).
Legs: All tarsi scopulate, furnished with small, very fine spines and, except for tarsus IV, with few dorsal clavate trichobothria. Lateral groups of short, sharp spines on anterior metatarsi and tibiae; stronger short spines present on patellae and in particular in dorsal distal zone of femora. Leg III with numerous spines on all segments, most prominent in dorsal prolateral zone of trochanter, distal patellar spines arranged in a short transverse row. Leg IV with short spines on all segments except coxa.
Paired claws (Fig. 14): Three or four sharp teeth of different lengths, distal or subdistal tooth longest. Unpaired claw smooth.
Abdomen (Fig. 7): Ovoid, soft, with evenly spaced short bristles.
Spinnerets: As in female (see below).
Measurements: TBL 16.6; CL 6.9; CW 6.3; CP 4.2; AR 1.10; PR 1.13; EL 0.62; dALE 0.32; dPLE 0.32; dAME 0.20; dPME 0.18; diAME 0.13; diPME 0.37; SL 3.7; SW 3.4; LL 0.8; LW 1.1; MaxL 2.1; PaL 9.1 (1.3 + 2.5 + 1.8 + 3.5); LL1 19.5 (1.5 + 3.8 + 5.0 + 3.0 + 6.2); LL2 17.3 (1.6 + 3.5 + 3.7 + 2.9 + 5.6); LL3 16.5 (1.9 + 4.1 + 3.1 + 2.6 + 4.8); LL4 22.2 (2.3 + 5.2 + 5.2 + 3.0 + 6.5); BuL 2.26; BuW 0.75; EmL 1.08.

Description of female (paratype)
Colouration: Generally as in male, but slightly lighter and more shaded brown carapace and lighter grey dorsal side of abdomen.
Carapace (Figs 8, 10): Longer than wide (CW/CL = 0.9), cephalic part strongly elevated, with shallow saddle-shaped depression between ocular mound and highest elevation shortly anterior of a steep decent to fovea (Fig. 10). Texture of cuticle smooth, few bristles of very different lengths and strengths widely scattered over cephalic part. Few very fine bristles on thoracic part. Fovea with outward curving ends (Fig. 8). Slope of thoracic part, clypeus and eye group as in male.
Chelicerae: Stronger than in male. Rastellum on a low elevation. Rows of teeth on either side of the fang groove stronger than in male.
Ventral side of cephalothorax (Fig. 12): Sternum as in male. Labium shaped as in male, but with small distal group of four cuspulus. Maxillae shaped as in male, prolateral distal heel strongly reduced, with a group of about 20 cuspules along proximal margin.
Palps: Tarsus with dorsal group of 11 to 13 clavate trichobothria, tarsus and tibia with dense lateral groups of mainly curvy spines over full lengths of segments, tarsal claw with one bifid proximal tooth (Fig. 16).
Legs: Posterior two pairs stronger than anterior two pairs, with clavate trichobothria as in male, distal three segments of legs I-II with dense groups of mainly curvy spines on their lateral surfaces, ventrally spineless, curvy spines absent from posterior legs. Spines on patella and metatarsus III situated dorsally, no trochanter spines as in male but long bristles instead.
Paired claws (Fig. 15): With proximal two to four teeth of different lengths, distal ones longest.
Abdomen: Larger than in male.
Spinnerets (Fig. 17): PMS one-segmented, digitiform, with light-coloured apical spigot field. PLS three-segmented, with macrospigots present on all segments. Proximal segment as wide as long, slightly cone-shaped, with narrow ventroapical spigot field, median segment short and cylindrical, its ventral spigot field with 7-9 prominent macrospigots irregularly distributed, distal segment very short and dome-shaped, apical spigot field with one or two central macrospigots.
Spermathecae: Monopartite parallel receptacles column-shaped, with only a slight constriction subcentrally and fully covered with gland pores for their entire length (Fig. 18).
Measurements: TBL 20.4; CL 7.5; CW 6.4; CP 5.1; AR 1.23; PR 1.28; EL 0.68; dALE 0.31; dPLE 0.33; dAME 0.20; dPME 0.22; diAME 0.13; diPME 0.41; SL 4.5; SW 4.0; LL 1.1; LW 1.3; MaxL 2.6; PaL 12.4 (2.7 + 2.8 + 2.6 + 4.3); LL1 13.7 (1.2 + 1.9 + 2.9 + 3.1 + 4.6); LL2 12.4 (1.2 + 1.9 + 2.3 + 2.8 + 4.2); LL3 12.4 (1.6 + 2.2 + 1.9 + 2.6 + 4.1); LL4 17.1 (1.8 + 3.1 + 3.5 + 3.3 + 5.4); Int 0.31; Ext 0.84.

Biology: The type specimens were collected from earth banks on one side of a dirt road in an old secondary forest near a waterfall. The burrows were quite short (not much longer than the spiders themselves) and had two wafer-like trapdoors. The backdoor opened into a blind chamber behind the burrow into which the spiders retreated when the front door was forced open.

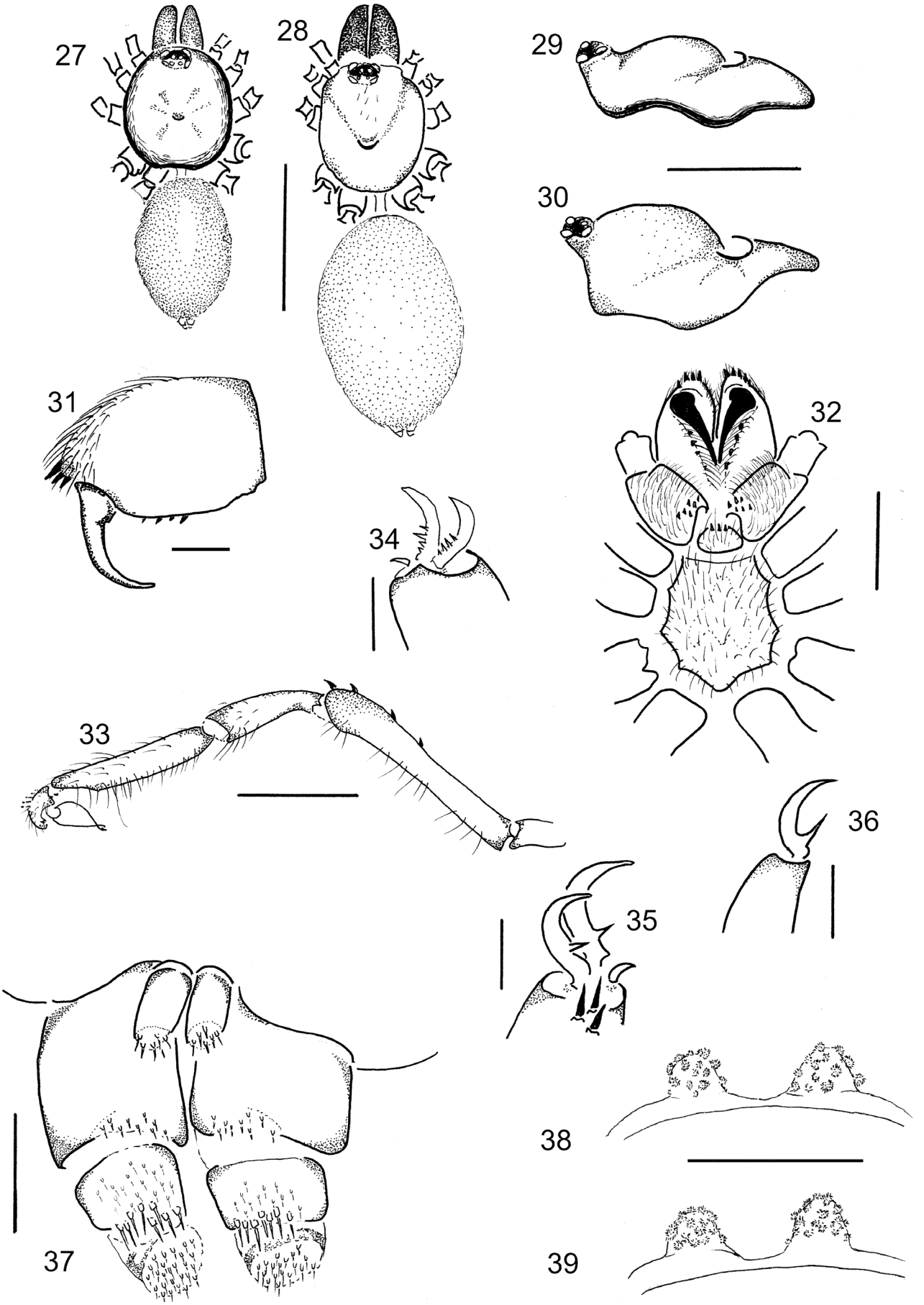
***Latouchia schwendingeri* sp. nov.**
Figs 23-39, 50-51

Types: MHNG, sample SV-03/05; male holotype (ID: PS-022; matured in early June 2004), one female allotype (ID: PS-016) and one female paratype (ID:



Figs 23-26. *Latouchia schwendingeri* sp. nov., male holotype (ID: PS-022), bulb with rotating axis (ax) indicated by broken vertical line. (23) Ventral view (na = medial abrupt narrowing of embolus; sp = spermductpore). (24) Retolateral view (py = pyriform proximal part). (25) Dorsal view (no = nose; sd = spermduct). (26) Prolateral view. Scale line 0.5 mm.

Figs 27-39. *Latouchia schwendingeri* sp. nov. (27) Dorsal habitus of male holotype (ID: PS-022). (28) Dorsal habitus of female allotype (ID: PS-016). (29) Lateral side of carapace of male. (30) Idem, of female. (31) Left chelicera of female in retrolateral view (note absence of stridulatory ridges). (32) Ventral Cephalothorax of female (note indistinctly fused central sigilla). (33) Left palp of male in retrolateral view (note elongated tibia, patella and femur). (34) Tarsal claws of leg I of male. (35) Tarsal claws of leg I of female. (36) Palp claw of female (note single sharp tooth). (37) Spinnerets of female in ventral view. (38) Spermathecae of female allotype (ID: PS-016) in ventral view. (39) Spermathecae of female paratype (ID: PS-017) in ventral view. Scale lines with numbers of millimetres between parentheses: Figs 27-30 (5); Figs 32-33 (2); Fig. 31 (1); Figs 37-39 (0.5); Figs 34-36 (0.2). ►



PS-017); Vietnam, Kien Giang Province, Nui Hang Tien, Hang Tien, north of Hong Chong; WGS84 10.18867, 104.59611; altitude 1 m (inside limestone cave); 11.08.2003; leg. P. J. Schwendinger.

Etymology: This species is named after Peter J. Schwendinger who collected and raised the type specimens and made them available for this study.

Diagnosis: This species is distinguished from all known *Latouchia* species, for which sufficient information is available, by its small size as measured by the length of the carapace. Male CL 3.9 in *L. schwendingeri* sp. nov. versus an average male CL of 6.1 (SD = 0.8) in eight *Latouchia* species reported on in the literature. Females CL 4.3 in *L. schwendingeri* sp. nov. versus an average female CL of 6.9 (SD = 1.8) in fifteen *Latouchia* species reported in the literature. The male furthermore differs from males described and illustrated in the literature (Pocock, 1901; Strand, 1907, 1910; Schenkel, 1953, 1963; Song & Hu, 1982; Song *et al.*, 1983; Haupt & Shimojana, 2001; Song *et al*., 2001; Tso *et al*., 2003; Ono, 2010), by an elongated proximal part of the bulb and by a short embolus with a bent 'nose-like' tip (Figs 23-26). Females differ from all known females of *Latouchia* species, with the exception of *L. huberi* sp. nov. described below, by the multilobed, 'berry-like' receptacles of the spermathecae (Figs 38-39). Females of *L. schwendigeri* sp. nov. differ from those of *L. huberi* sp. nov. by the very short, dome-shaped receptacles of the spermathecae (compare Figs 38-39 with Figs 46-47) and by leg III being distinctly longer than leg II.

Description of male (holotype)

Colouration: Carapace uniformly dull dark brown; abdomen dorsally almost uniformly light grey, with a faintly lighter zone in cardiac region, ventrally light grey, slightly yellowish; chelicerae uniformly brown; sternum and ventral side of leg coxae light brown; labium and maxillae darker brown; PMS creamy white, PLS light yellowish; legs generally light brown, proximally slightly darker than distally; palps slightly darker brown than legs, dorsal side of femora of all limbs dark brown, generally ranging from brown proximally to light yellow distally.

Carapace (Figs 27, 29): Roundish in dorsal view, slightly longer than wide (w/l = 0.9), with thickened rim around lateral and caudal margins, texture of cuticle finely granular, wrinkled along the edges, glabrous except for few fine bristles on cephalic part. Fovea procurved and regularly crescent-shaped, with thickened posterior rim. Cephalic part regularly curved upward, with a narrow depression directly posterior of eye group, thoracic part of carapace gradually curving downward from fovea (Fig. 29). Clypeus narrow; ocular process almost touching anterior carapace edge. Eye group twice as wide as long (EL/PR = 0.5), slightly trapezoidal, PR slightly wider than AR (AR/PR = 1.06), AME on low mound, anterior eyes grey, posterior eyes pearly white.

Chelicerae (Fig. 31): Dorsally with two wide glabrous zones separated by longitudinal bands with fine bristles, these distally merging with a field of stronger bristles and apical rastellar teeth; ventral fang groove dentate along both edges, teeth in both rows separated and irregularly arranged; fang long and sharp; rastellar teeth on a low mound.

Ventral side of cephalothorax: Sternum slightly longer than wide (w/l = 0.9), roughly oval in shape, widest between coxae II and III, sigilla indistinct. Labium wider than long (w/l = 1.2), roundish, dome-shaped, without cuspules. Maxillae roughly rectangular, without cuspules or distal prolateral heel.

Palps (Fig. 33): Tibia and femur strongly elongated. Cymbium dorsally with small group of 4-5 clavate trichobothria, spines absent. Femur with curved, short, thorn-like spines dorsally in distal half of segment. Bulb (Figs 23-26) with proximal part pyriform (Fig. 24), longer than embolus. Embolus proximally wide, medially abruptly narrowing (Fig. 23), distally bent, with a 'nose-shaped' part extending beyond sperm duct pore (best seen in ventral and dorsal views, Figs 23, 25).

Legs: Tarsi spineless, spines present on all other segments, trochanter spines small. Leg I with strong spines on the prolateral side of patella, on prolateral and ventral side of tibia and on ventral side of metatarsus; patella III with spines on all sides and with a distinctive transverse spine row along dorsodistal margin. Tarsi I and II with thin scopula (absent from tarsi III and IV), few clavate trichobothria dorsally in proximal half of segment (absent from tarsus IV).

Paired claws: Anterior legs with short rows of 3-4 teeth grouped together (Fig. 34), posterior legs with rows of only 1-2 teeth; third claw small, unarmed and curved.

Abdomen: Ovoid in dorsal view, soft, with fine bristles evenly spaced.

Spinnerets: As in female (see below).

Measurements: TBL 9.8; CL 3.9; CW 3.5; CP 2.2; AR 0.78; PR 0.83; EL 0.39; dALE 0.26; dPLE 0.14; dAME 0.13; dPME 0.13; diAME 0.07; diPME 0.23; SL 2.1; SW 1.8; LL 0.6; LW 0.8; MaxL 1.4; PaL 8.9 (0.6 + 2.7 + 2.0 + 3.6); LL1 12.7 (1.2 + 2.7 + 2.7 + 2.0 + 4.1); LL2 11.6 (1.2 + 2.6 + 2.4 + 1.7 + 3.7); LL3 11.0 (1.5 + 2.9 + 1.9 + 1.6 + 3.1); LL4 14.0 (1.6 + 3.7 + 3.0 + 1.7 + 4.0) BuL 1.01; BuW 0.41; EmL 0.37.

Description of female (allotype)

Colouration: Carapace yellow, abdomen light grey, other body parts as in male.

Carapace (Figs 28, 30): Cuticle smooth, with few bristles of very different lengths and strengths widely distributed over cephalic part and with very few fine bristles on thoracic part. Cephalic part elevated, curving upward from ocular mound before descending steeply down to fovea (Fig. 30). Thoracic part almost straight, gently

sloping down from fovea to posterior carapace margin. Fovea procurved, slightly recurving at both ends.
Chelicerae: Stronger than in male; rastellum with four strong apical teeth in a transverse row on a distinct elevation; parallel rows of strong teeth on each side of fang groove.
Ventral side of cephalothorax (Fig. 32): Sternum as in male (SW/SL = 0.9). Labium as in male, but with small group of two to three apical cuspulus. Maxillae, as in male, prolateral distal heel absent, with groups of about 14 sharp pointed cuspules along proximal margin.
Palps: Tarsus with dorsal groups of 7 clavate trichobothria, tarsus and tibia with dense lateral groups of mainly curvy spines over entire lengths of segments (as illustrated for *L. huberi* sp. nov. in Fig. 43), tarsal claw smooth or with one sharp proximal tooth (Fig. 36).
Legs: Posterior two pairs of legs stronger than anterior two pairs, tarsal clavate trichobothria as in male, distal two segments of legs I and II with bands of spines on their lateral surfaces (as illustrated for *L. huberi* sp. nov. in Fig. 44), more dorsally situated spines in these groups short and curvy, more ventrally situated spines longer and straight; bands of spines on tibiae reduced. Spines on patella and metatarsus III situated dorsally; no trochanter spines as in male, but long bristles instead.
Paired claws (Fig. 35): With single proximal tooth (reduced on leg IV).
Abdomen: Larger than in male.
Spinnerets: PMS digitiform, with few fine distal spigots. PLS with macrospigots only distally on median segment (Fig. 37). Proximal segment as wide as long, cylindrical, with few fine distal spigots; median segment short, with double row of distal macrospigots; distal segment very short, knob-shaped, with apical field of fine spigots.
Spermathecae (Figs 38-39): Monopartite, very short, dome-shaped, with numerous vesicles on surface giving them a raspberry-like appearance.
Measurements (allotype): TBL 14.2; CL 4.3; CW 3.6; CP 2.7; AR 0.84; PR 0.89; EL 0.62; dALE 0.24; dPLE 0.17; dAME 0.12; dPME 0.17; diAME 0.08; diPME 0.31; SL 2.6; SW 2.2; LL 0.7; LW 0.9; MaxL 1.6; PaL 8.0 (1.7 + 1.8 + 1.7 + 2.8); LL1 8.6 (0.9 + 1.3 + 1.7 + 1.8 + 2.9); LL2 7.4 (0.9 + 1.1 + 1.4 + 1.6 + 2.4); LL3 8.0 (1.2 + 1.4 + 1.1 + 1.8 + 2.5); LL4 10.5 (1.3 + 2.0 + 2.1 + 1.9 + 3.2); Int 0.24; Ext 0.63.
Measurements (paratype): TBL 12.9; CL 4.2; CW 3.6; CP 2.7; AR 0.77; PR 0.83; EL 0.40; dALE 0.26; dPLE 0.17; dAME 0.12; dPME 0.14; diAME 0.06; diPME 0.32; SL 2.4; SW 2.2; LL 0.7; LW 0.9; MaxL 1.4; PaL 7.3 (1.6 + 1.6 + 1.5 + 2.6); LL1 7.8 (0.9 + 1.1 + 1.4 + 1.7 + 2.7); LL2 6.6 (0.8 + 1.0 + 1.1 + 1.4 + 2.3); LL3 7.4 (1.1 + 1.3 + 1.1 + 1.6 + 2.3); LL4 9.5 (1.2 + 1.7 + 1.9 + 1.8 + 2.9); Int 0.30; Ext 0.66.

Biology: The specimens examined were collected from burrows dug into the loamy floor of a limestone cave at the coast. The cave itself was not flooded during high tide, but its surroundings were. The burrows were distinctly longer than the spider inhabitants and equipped with a single, thick, cork-shaped trapdoor. Several burrows were found close to each other, which is unusual for SE-Asian Ummidiinae.

***Latouchia huberi* sp. nov.**

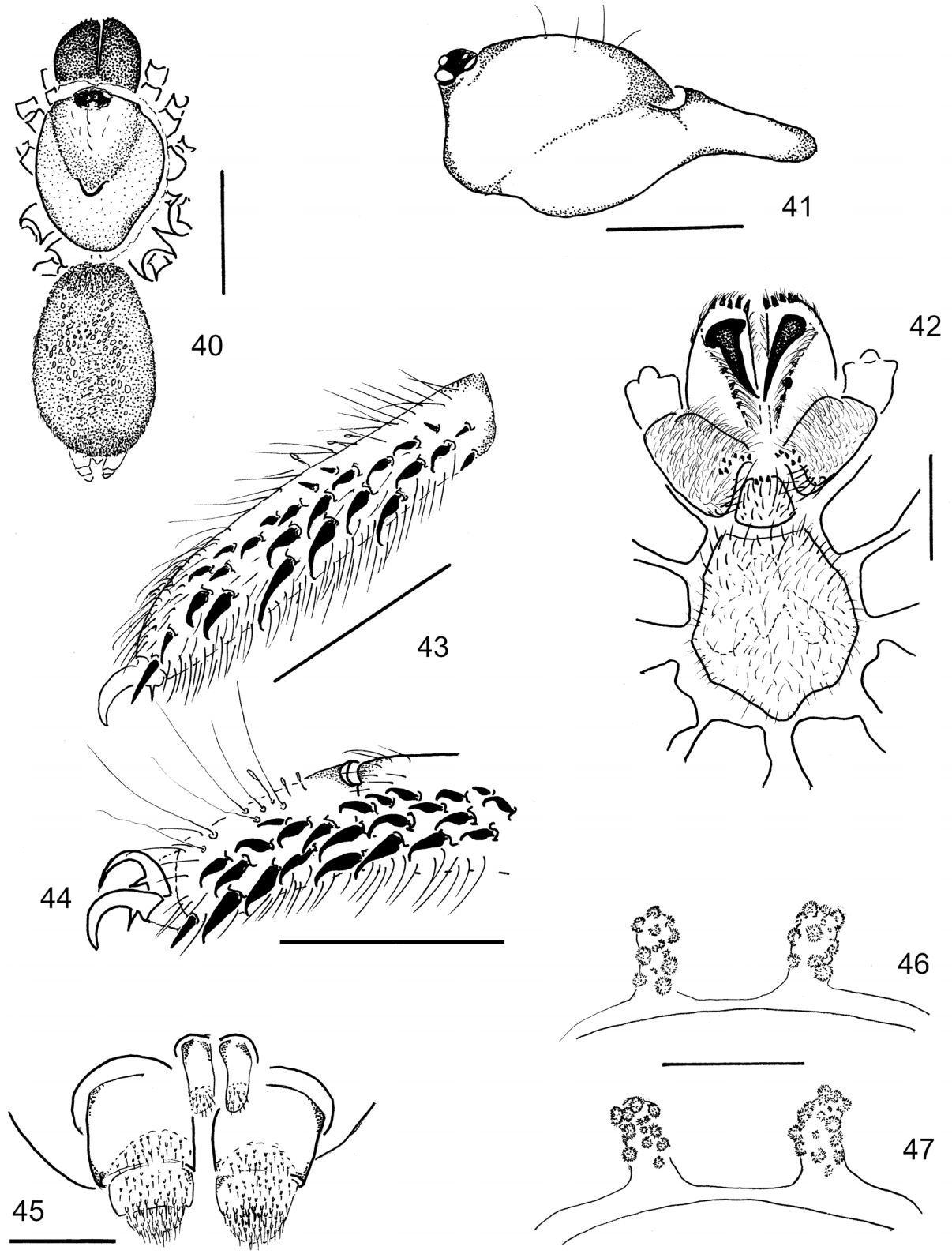
Figs 40-47, 52

Types: MHNG, sample SV-03/04; female holotype (ID: PS-020), 3 female paratypes (ID: PS-018, PS-019, PS-021, PS-023); Vietnam, Kien Giang Prov., Mui Nai Beach; WGS84 10.37856, 104.44864; altitude 5 to 50 m; 10.08.2003; leg. P. J. Schwendinger.

Etymology: The species is named after Siegfried Huber (Mühlhofen, Germany), an expert collector of cryptozoic arachnids, several of which belong to species new to science.

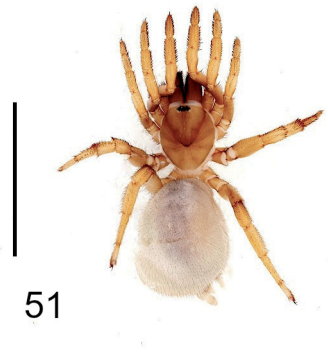
Diagnosis: Females are very similar to those of *L. schwendingeri* sp. nov. described above, but different in the, on average, larger size of adult females (CL 5.7, SD = 0.5, n = 5 versus CL 4.2-4.3, n = 2 in *L. schwendingeri* sp. nov.), in the distinctly darker coloured abdomen (compare Fig. 40 with Fig. 28 and Fig. 52 with Fig. 51), in the relative lengths of leg II and leg III (see diagnosis of *L. schwendingeri* female above) and in the longer, straight, tube-shaped receptacles of the spermathecae (Figs 46-47).

Description of female (holotype)
Colouration: Carapace brown, thoracic part slightly lighter than cephalic part, abdomen dorsally uniformly dark grey, ventrally light grey, chelicerae uniformly dark brown, sternum and ventral side of leg coxae yellowish brown, labium and maxillae darker brown, PMS light grey, PLS light yellowish, legs generally light brown, ventrally yellowish.
Carapace (Figs 40-41): Longer than wide (CW/CL = 0.8), posteriorly narrowing, cuticle smooth, glabrous except for some fine bristles on elevated cephalic part. Cephalic part only slightly rising behind ocular process and then descending steeply to fovea (Fig. 41), thoracic part gradually descending from fovea to posterior carapace margin. Fovea procurved, slightly recurving at both ends.
Chelicerae: Rastellum composed of strong teeth grouped on a distinct process; parallel rows of strong, teeth along sides of fang groove; teeth in retrolateral row strongest.
Ventral side of cephalothorax (Fig. 42): Sternum longer than wide (SW/SL = 0.9). Sigilla fused, impression indistinct. Labium cone-shaped, anteriorly truncated, proximally wider than long (LW/LL = 1.3), apically with a group of three sharp pointed cuspules. Maxillae roughly rectangular, with distinct proximal 'heel' and with groups of 10-12 sharp pointed cuspules along proximal margin, distal prolateral heel absent.



Figs 40-47. *Latouchia huberi* sp. nov. (40) Dorsal habitus of female holotype (ID: PS-020). (41) Lateral aspect of carapace of female. (42) Ventral Cephalothorax of female (note indistinctly fused central sigilla). (43) Left palp tarsus of female in retrolateral view (note dense field of curvy spines over entire length of segment). (44) Distal end of leg I of female in retrolateral view (note dense fields of curvy spines, single claw tooth and clavate trichobothria on dorsal side of tarsus). (45) Spinnerets of female holotype in ventral view. (46) Spermathecae of female holotype (ID: PS-020) in ventral view. (47) Spermathecae female paratype (ID: PS-021) in ventral view. Scale lines with number of millimetres between parentheses: Figs 40-41 (5); Fig. 42 (2); Figs 43-47 (1).

Figs 48-49. *Latouchia stridulans* sp. nov., dorsal habitus of specimens as studied submerged in 70% ethanol. (48) Male holotype, (49) Female allotype. Scale bars 2 mm.



Figs 50-51. *Latouchia schwendingeri* sp. nov. dorsal habitus of specimens as studied submerged in 70% ethanol. (50) Male holotype, scale bar 1 mm. (51) Female allotype, scale bar 2 mm.

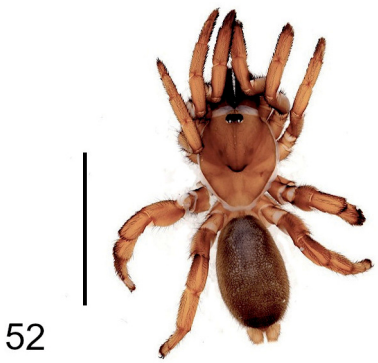


Fig. 52. *Latouchia huberi* sp. nov. dorsal habitus of specimen as studied submerged in 70% ethanol. Female holotype, scale bar 2 mm.

Palp: Tarsus (Fig. 43) with dorsal groups of 4-5 clavate trichobothria, tarsus and tibia with dense lateral bands of mainly curvy spines over entire lengths of segments, tarsal claw with small proximal tooth.
Legs: Posterior two pairs of legs stronger than anterior two pairs, with few clavate trichobothria proximally on tarsi I (Fig. 44) and II, reduced on tarsus III and absent from tarsus IV. Distal two segments of legs I and II with bands of spines on their lateral surfaces (Fig. 44), more dorsal spines in these groups short and curvy, more ventral spines longer and straight, tibial spine groups restricted to distal half of segment. Spines on patella and metatarsus III situated dorsally, trochanter without modifications.
Paired claws (Fig. 44): With single proximal tooth (smaller on claws of leg IV).
Abdomen: Ovoid, evenly covered with fine bristles, few larger bristles in anterior part of dorsal area.
Spinnerets: PMS digitiform, with few fine distal spigots. PLS with macrospigots only distally on median segment (Fig. 45). Proximal segment as wide as long, cylindrical, with few fine distal spigots; median segment short, with double row of distal macrospigots; distal segment very short, knob-shaped, with apical field of fine spigots.
Spermathecae (Figs 46-47): Monopartite, two column-shaped receptacles almost parallel to each other, with numerous berry-like vesicles.
Measurements (holotype): TBL 16.4; CL 6.2; CW 5.0; CP 3.9; AR 1.08; PR 1.12; EL 0.58; dALE 0.37; dPLE 0.24; dAME 0.14; dPME 0.18; diAME 0.14; diPME 0.40; SL 3.6; SW 3.2; LL 0.9; LW 1.2; MaxL 2.2; PaL 10.3 (2.1 + 2.3 + 2.3 + 3.6); LL1 11.0 (1.0 + 1.6 + 2.2 + 2.5 + 3.7); LL2 9.8 (1.1 + 1.5 + 1.8 + 2.2 + 3.2); LL3 9.7 (1.4 + 1.8 + 1.3 + 2.2 + 3.0); LL4 12.9 (1.5 + 2.6 + 2.4 + 2.6 + 3.8); Int 0.35; Ext 0.63.
Variation in measurements of females (n = 4): TBL 13.7-16.4; CL 5.0-6.2; CW 4.3-5.0; CP 3.2-3.9; AR 0.90-1.08; PR 0.98-1.12; EL 0.51-0.58; dALE 0.29-0.37; dPLE 0.18-0.24; dAME 0.12-0.14; dPME 0.15-18; diAME 0.11-0.14; diPME 0.32-0.41; SL 3.1-3.6; SW 2.7-3.2; LL 0.9; LW 1.1-1.2; MaxL 1.9-2.2; PaL 9.0-10.3; LL1 9.3-11.0; LL2 8.2-9.8; LL3 8.5-9.7; LL4 10.9-12.9; Int 0.25-0.35, Ext 0.55-0.63.

Biology: The type specimens were collected from earthbanks along a road near the coast, where such spiders appeared to be quite abundant (unusual for SE-Asian Ummidiinae). Their burrows were quite long (5-8 cm) and equipped with a single, cork-shaped trapdoor, much like in *L. schwendingeri* sp. nov.

DISCUSSION

Within the Rastelloidina (i.e. mygalomorph spiders carrying a distinct rastellum at the apex of the proximal segment of the chelicerae), the Ummidiinae are remarkable in several aspects. In phylogenetic analysis they form a distinct taxon containing three genera: *Ummidia*, *Conothele* and *Latouchia* (Godwin *et al*., 2018). Morphologically Ummidiinae differ from all other rastelloids by the presence of clavate trichobothria on the dorsal side of the tarsi of legs and palps. Clavate trichobothria however, are also present in the rastelliod/idiopid genus *Prothemenops*, but in contrast to the ummidines, here clavate trichobothria are located on the metatarsi of legs and on the tarsi of the palps Schwendinger (1991), Schwendinger & Hongpadharakiree (2014). In their geographical distribution the Ummidiinae deviate from the common pattern of regionally restricted geographical ranges seen in nearly all mygalomorph taxa. The sister genera *Ummidia* and *Conothele* are morphologically and behaviourally indistinguishable (personal observation) and together show an almost cosmopolitan distribution. *Ummidia* is known from the Americas, southern Europe, northern Africa and Central Asia, *Conothele* is known from India, Southeast Asia, Australia and several islands in the Pacific and in the Indian Ocean. The remarkable worldwide uniformity of ummidiines is interrupted only in southeastern Asia where *Conothele* occurs sympatrically with the morphologically distinct genus *Latouchia*. From observations reported here it is obvious that ummidiine diversity in southeastern Asia is currently insufficiently known and it is expected that unknown genera await description. The substantial morphological difference found here between *L. stridulans* sp. nov. on one hand and *L. schwendingeri* sp. nov. and *L. huberi* sp. nov. on the other hand indicate the necessity to subdivide the genus *Latouchia* into two or more genera. Above reported differences in the structure of burrows and trapdoors provide further support for the division of the genus. The absence of reference material at this stage however, prevents further taxonomical refinement.

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REFERENCES

Charitonov D.E. 1946. New forms of spiders of the USSR. *Izvestija Estedvenno-Nauchnogo Instituta pri Molotovskom Gosudarstvennom Universitete imeni M. Gor'kogo* 12: 19-32.

Decae A.E. 2010. The genus *Ummidia* in the western Mediterraneran, a review (Araneae, Mygalomorphae, Ctenizidae). *Journal of Arachnology* 38: 328-340.

Godwin R.L., Opatova V., Garrison N.L., Hamilton C.A., Bond J.E. 2018. Phylogeny of a cosmopolitan family of morphologically conserved trapdoor spiders (Mygalomorphae, Ctenizidae) using Anchored Hybrid Enrichment, with a description of the family, Halonoproctidae Pocock 1901. *Molecular Phylogenetics and Evolution* 126: 303-313.

Haupt J., Shimojana M. 2001. The spider fauna of soil banks: the genus *Latouchia* (Arachnida, Araneae, Ctenizidae) in southern Japan and Taiwan. *Mitteilungen aus dem Museum für Naturkunde in Berlin* (Zoologische Reihe) 77: 95-110.

Koch L. 1878. Japanesische Arachniden und Myriapoden. *Verhandlungen der kaiserlich-königlichen zoologisch-botanischen Gesellschaft in Wien* 27: 735-798.

Ono H. 2010. Four new spiders (Arachnida, Araneae) of the families Liphistiidae, Ctenizidae, Araneidae and Ctenidae from Vietnam. *Memoirs of the National Museum of Nature and Science Tokyo* 46: 1-12.

Pocock R.I. 1901. On some new trap-door spiders from China. *Proceedings of the Zoological Society of London* 70(2): 207-215.

Raven R.J. 1985. The spider infraorder Mygalomorphae (Araneae): cladistics and systematics. *Bulletin of the American Museum of Natural History* 182(1): 1-180.

Schenkel E. 1953. Chinesische Arachnoidea aus dem Museum Hoangho-Peiho in Tientsin. *Boletim do Museu Nacional do Rio de Janeiro* (N.S., Zool.) 119: 1-108.

Schenkel E. 1963. Ostasiatische Spinnen aus dem Muséum d'Histoire naturelle de Paris. *Mémoires du Muséum National d'Histoire Naturelle de Paris* (A, Zool.) 25: 1-481.

Simon E. 1886. Arachnides recueillis par M. A. Pavie (sous-chef du service des postes au Cambodge) dans le royaume de Siam, au Cambodge et en Cochinchine. *Actes de la Société Linnéenne de Bordeaux* 40: 137-166.

Simon E. 1897. Matériaux pour servir à la faune arachnologique de l'Asie méridionale. V. Arachnides recueillis à Dehra-Dun (N. W. Prov.) et dans le Dekkan par M. A. Smythies. *Mémoires de la Société Zoologique de France* 10: 252-262.

Simon E. 1903. Histoire naturelle des araignées, vol. 2. *Roret, Paris*, pp. 669-1080.

Song D.X., Hu J.L. 1982. A description of the female of *Latouchia pavlovi* Schenkel 1953 (Araneida: Ctenizidae). *Journal of Shadong University* 2: 178-181.

Song D.X., Qiu Q.H., Zheng Z.M. 1983. A new species of spider of the genus *Latouchia* (Araneae: Ctenizidae) from China. *Zoological Research* 4: 373-376.

Song D.X., Zhu M.S., Chen J. 2001. The Fauna of Hebei, China: Araneae. *Hebei University of Science and Techology Publishing House, Shijiazhuang,* 510 pp.

Strand E. 1907. Avicularиidae und Atypidae des Kgl. Naturalienkabinetts in Stuttgart. *Jahreshefte des Vereins für vaterländische Naturkunde in Württemberg* 63: 1-100.

Strand E. 1910. Eine neue japanische Ctenizine (Araneae). *Deutsche Entomologische Zeitschrift* 1910: 441-442.

Schwendinger P.J. 1991. Two new trap-door spiders from Thailand (Araneae, Mygalomorphae, Idiopidae). *Bulletin of the British arachnological Society* 8: 233-240.

Schwendinger P.J., Hongpadharakiree K. 2014. Three new *Prothemenops* species (Araneae: Idiopidae) from central Thailand. *Zootaxa* 3893(4): 530-550. Https://doi:10.11646/zootaxa.3893.4.3

Thorell T. 1887. Viaggio di L. Fea in Birmania e regioni vicine. II. Primo saggio sui ragni birmani. *Annali del Museo Civico di Storia Naturale di Genova* 25: 5-417.

Tso I.M., Haupt J., Zhu M.S. 2003. The trapdoor spider family Ctenizidae (Arachnida: Araneae) from Taiwan. *Raffles Bulletin of Zoology* 51: 25-33.

World Spider Catalog 2019. World Spider Catalog. Version 20.0. Natural History Museum Bern. Online at http://wsc.nmbe.ch (accessed on July 14th 2019). Https://doi: 10.24436/2