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New euagrid spider species from Thailand and Malaysia, and new localities of *Leptothele bencha* (Arachnida: Araneae)

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Abstract: *Leptothele chang* Schwendinger, sp. nov. (males and females) is described and additional localities of *L. bencha* Raven & Schwendinger, 1995 in southern Thailand are given. *Malayathele* Schwendinger, gen. nov. is established, and four new species from Peninsular Malaysia are placed in this genus. These are *M. cameronensis* Schwendinger, sp. nov. (male and female), *M. kanching* Schwendinger, sp. nov. (males and females), *M. maculosa* Schwendinger, sp. nov. (males and females) and *M. ulu* Schwendinger, sp. nov. (males and females). Identification keys to the genera of Euagridae in Asia and to the species of *Leptothele* and *Malayathele* gen. nov. are given. Information on variation of taxonomic characters, biology, sexual behaviour and biogeography is provided.

Keywords: Taxonomy - Mygalomorphae - Euagridae - Masteriinae - *Phyxioschema* - variation - distribution - biology - mating behaviour.

INTRODUCTION

Leptothele was established as a monotypic genus by Raven & Schwendinger (1995: 637) and regarded as sister to the American genus *Euagrus* Ausserer, 1875 plus the Asian genus *Phyxioschema* Simon, 1889. All three genera share the synapomorphic presence of a retrodorsal band of hooked spinules on femur I and of a retroventral band on femur II of males (used to lock legs I and II together during mating; Coyle, 1986), as well as the presence of a medioventral spur carrying megaspines on tibia II of males (Coyle, 1988; Raven, 1981a; Raven & Schwendinger, 1995). Originally described in the family Dipluridae, *Euagrus*, *Phyxioschema* and *Leptothele* were recently transferred to the family Euagridae Raven, 1979, which was established as a tribe (then spelled Evagrini), later elevated to a subfamily by Raven (1985) and recently to a family by Opatova *et al.* (2020) on the basis of a purely genomic analysis which did not include *Phyxioschema* and *Leptothele* (Opatova *et al.*, 2020: fig. 3). Twelve genera and 81 species were previously placed in this family (World Spider Catalog, 2020); here one genus and five species are added.

Raven & Schwendinger (1995: 637) stated that the dentition of the unpaired leg claws in *Leptothele bencha* is intermediary between the condition in the diplurid subfamily Masteriinae (all teeth set on a common raised base) and the Euagrinae (all teeth sessile on the claw) (Raven, 1985: fig. 6 and table 7). In *L. bencha* the distalmost tooth is sessile on the claw, whereas the remaining teeth are on a common, yet quite low base. The illustrated unpaired claw is that of leg I (Raven & Schwendinger, 1995: fig. 3F). The same was also found in one of the newly collected *L. bencha* specimens (a female from Ko Siray), but only on the anterior legs (Fig. 1E showing the unpaired claw of leg I). On leg III, however, all teeth are clearly sessile on the claw (Fig. 1F). The reverse situation can be seen in *L. chang* sp. nov.: leg I has all teeth sessile on the claw (Fig. 1G) and leg III has the proximal teeth raised on a low common base (Fig. 1H). The same situation is also found in *Phyxioschema huberi* Schwendinger, 2009 (Fig. 1C-D) and in *Malayathele ulu* sp. nov. (Fig. 1I-J). For *P. spelaeum* Schwendinger, 2009 another variant was illustrated: the three distal teeth on leg IV are sessile, whereas the basal five teeth are on an indistinct common base (Schwendinger, 2009: fig. 21D). So it seems to be a shared trait in the genera *Phyxioschema*, *Leptothele* and *Malayathele* gen. nov. that

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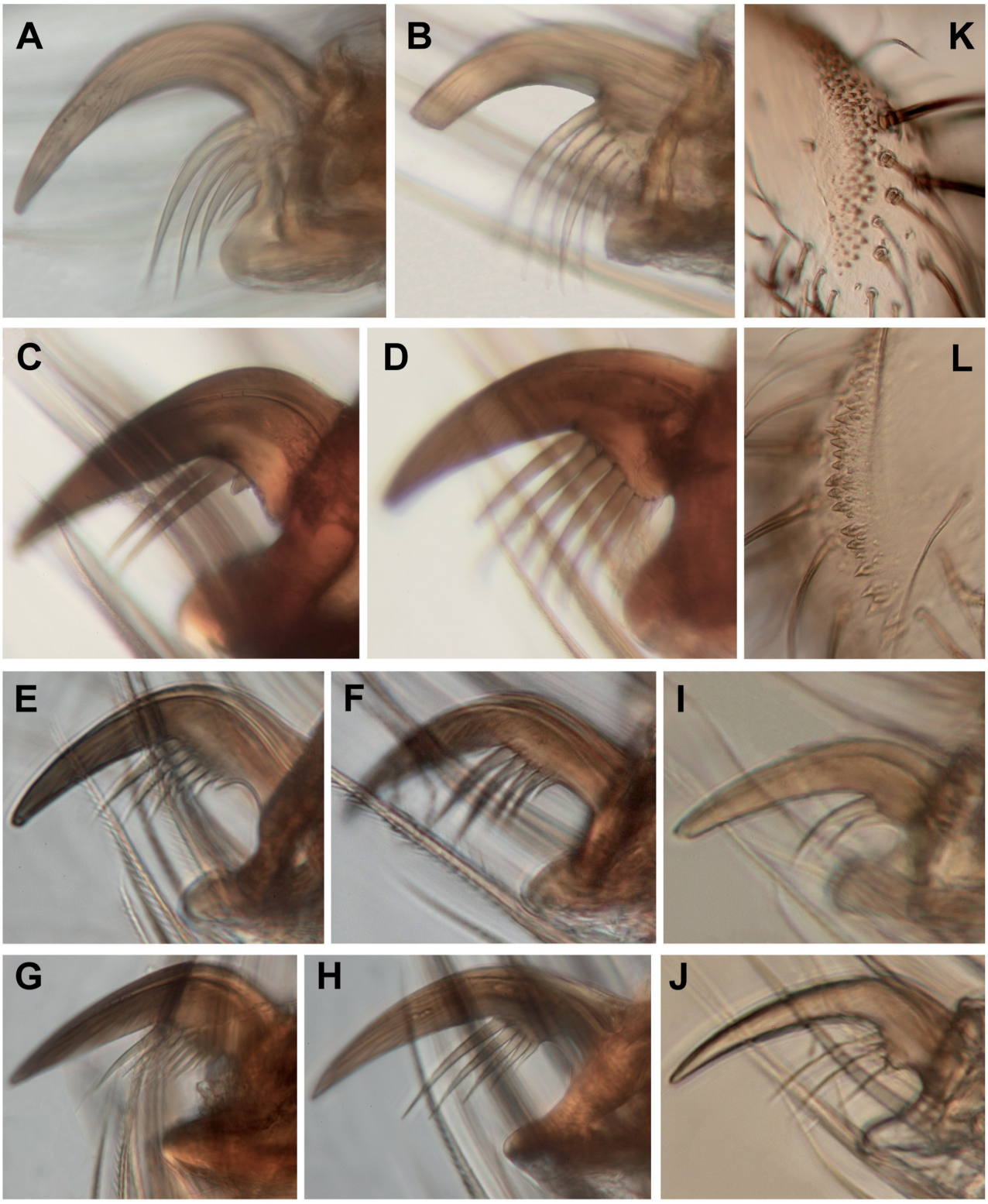

Fig. 1. Photos of unpaired leg claws, lateral view (A-J), and of serrula on palpal coxa, anteroventral view (K-L). (A) *Masteria* cf. *cavicola* (Simon, 1892), female (in MHNG; 13.IV.1977; leg. P. Strinati & V. Aellen) from a cave near Bagio, Luzon, the Phillipines, leg II. (B) Same, leg IV. (C) *Phyxioschema huberi* Schwendinger, 2009, exuvia of female paratype, leg I. (D) Same, leg IV. (E) *Leptothele bencha*, female from Ko Sirey, leg I. (F) Same, leg III. (G) *Leptothele chang* sp. nov., exuvia of female paratype, leg I. (H) Same, leg III. (I) *Malayathele ulu* sp. nov., exuvia of female paratype, leg I. (J) Same, leg IV. (K) *Leptothele chang* sp. nov., exuvia of female paratype. (L) *Malayathele kanching* sp. nov., exuvia of female paratype. Not to scale.

some teeth on the unpaired claws of some legs are set on a common base, and this does "severely test" the distinction between Euagrinae and Masteriinae with regards to the dentition of the unpaired claw (Raven & Schwendinger, 1995: 637). Further muddying the waters is a female specimen of *Masteria* sp. [presumably *M. cavicola* (Simon, 1892)] from a cave in the Philippines, deposited in the MHNG, that does not have all teeth of the unpaired claws of leg II and IV raised on a common base (Fig. 1A-B) – certainly not those of leg II (Fig. 1A). This is quite different from the typical masteriine dentition illustrated for *Masteria magna* Raven, 1981b and *Striamea gertschi* Raven, 1981b in which all teeth are clearly raised on a distinct common base (Raven, 1981b: fig. 24, and Raven, 1981b: fig. 23 as well as Passanha & Brescovit, 2018: fig. 35B, respectively). At the moment, and without a more comprehensive comparative study, the morphology of the unpaired claw cannot be considered as a reliable character for the distinction of family-level taxa in the Dipluridae and Euagridae.

The geographical ranges of *Leptothele* and *Phyxioschema* slightly overlap in Krabi Province, southern Thailand (Fig. 2; Schwendinger, 2009: fig. 1). However, in that contact zone the ecological niches of both genera are quite different: *L. bencha* builds tiny webs in small spaces in the soil and leaf litter on mostly granite bedrock, whereas all *Phyxioschema* spp. in southern Thailand live in quite large (comparable to those of *Macrothele* spp.) webs in holes and cracks of limestone cliffs, cave walls and speleothems. *Leptothele* was previously known from only a single species, *L. bencha*, and only from the type locality in southern Thailand. In the meantime this species has been collected at several other localities in that area, and specimens of five additional, quite closely related euagrid species were discovered further to the south on the Thai-Malay Peninsula. These are treated in the following.

MATERIAL AND METHODS

Methods: Morphological characters were studied and drawn mainly with a Zeiss SV11 stereomicroscope and an attached drawing tube, the vulvae and claws with a Nikon Optiphot and a Zeiss Axioskop compound microscope with attached drawing tubes. Female copulatory organs were mostly examined from alcohol-preserved specimens after making the dissected parts transparent by first dipping them into cold KOH for less than a minute and then drawing them in lactic acid without removing the gland tissue because clearing off the surrounding gland tissue results in the collapse of receptacular heads. Body measurements are all in mm (for other measurements the units are given) and were taken on the dorsal side, between midpoint of anterior and posterior margin. Total length includes chelicerae and anal tubercle, but not the spinnerets. Leg and palp measurement are given in the following manner: total length (femur + patella + tibia + metatarsus + tarsus). Spine counts taken from both sides of the body (e.g. left and right tibia I) are separated by a forward slash. Terminology follows that used in Raven & Schwendinger (1995) and Schwendinger (2009). In the paragraph "Variation" only taxonomic characters considered to be relevant are mentioned. Hairs and weak bristles are not shown in the drawings of male characters. In the figure legends references to illustrations that are to the same scale are separated by commas, references to illustrations of different scales by semi-colons. The species are presented in geographical order, from north to south.

Museum acronyms: The museums holding type specimens and non-type specimens are given by acronyms in the paragraphs on material examined for each species. MHNG = Muséum d'histoire naturelle de Genève, Switzerland; NHMS = Lee Kong Chian Natural History Museum, Singapore; QMS = Queensland Museum, Brisbane, Australia; THNHM = Thailand Natural History Museum, Pathumthani, Thailand.

Other abbreviations used in the text: ALE = anterior lateral eyes; AME = anterior median eyes; d = dorsal; MOQ = median ocular quadrangle; p = prolateral; PLE = posterior lateral eyes; PLS = posterior lateral spinnerets; PME = posterior median eyes; PMS = posterior median spinnerets; r = retrolateral; v = ventral. Additional abbreviations are explained in the corresponding figure legends.

TAXONOMY

Euagridae Raven, 1979

Diagnosis: See Raven, 1985: 78-79.

Leptothele Raven & Schwendinger, 1995

Leptothele Raven & Schwendinger, 1995: 636-637.

Type species: *Leptothele bencha* Raven & Schwendinger, 1995 by monotypy and by designation.

Species included: *Leptothele bencha* Raven & Schwendinger, 1995 and *L. chang* sp. nov.

Revised diagnosis: Distinguished from *Phyxioschema* by males lacking a prolateral band of elongated spinules and by possessing a much shorter ventral spur (Figs 3B, E, 5E, 6G cf. Raven, 1981: fig. 7; Schwendinger, 2009: figs 2D, 4C, 5C, 9C, 12C, 15C) and a low transversal subdistal ventral ridge on tibia II (Figs 3B-C, E-F, I-J, 5E, 6G-K), and by possessing a single, widely conical or mound-like ventral process instead of 2-3 longitudinal ridges on metatarsus II (Figs 3B-C, E-F, I-J, 5E, 6G-I cf. Raven, 1981a: fig. 7; Schwendinger, 2009: figs 2D, 6J, 10J, 13J, 16K, 19L). Females with

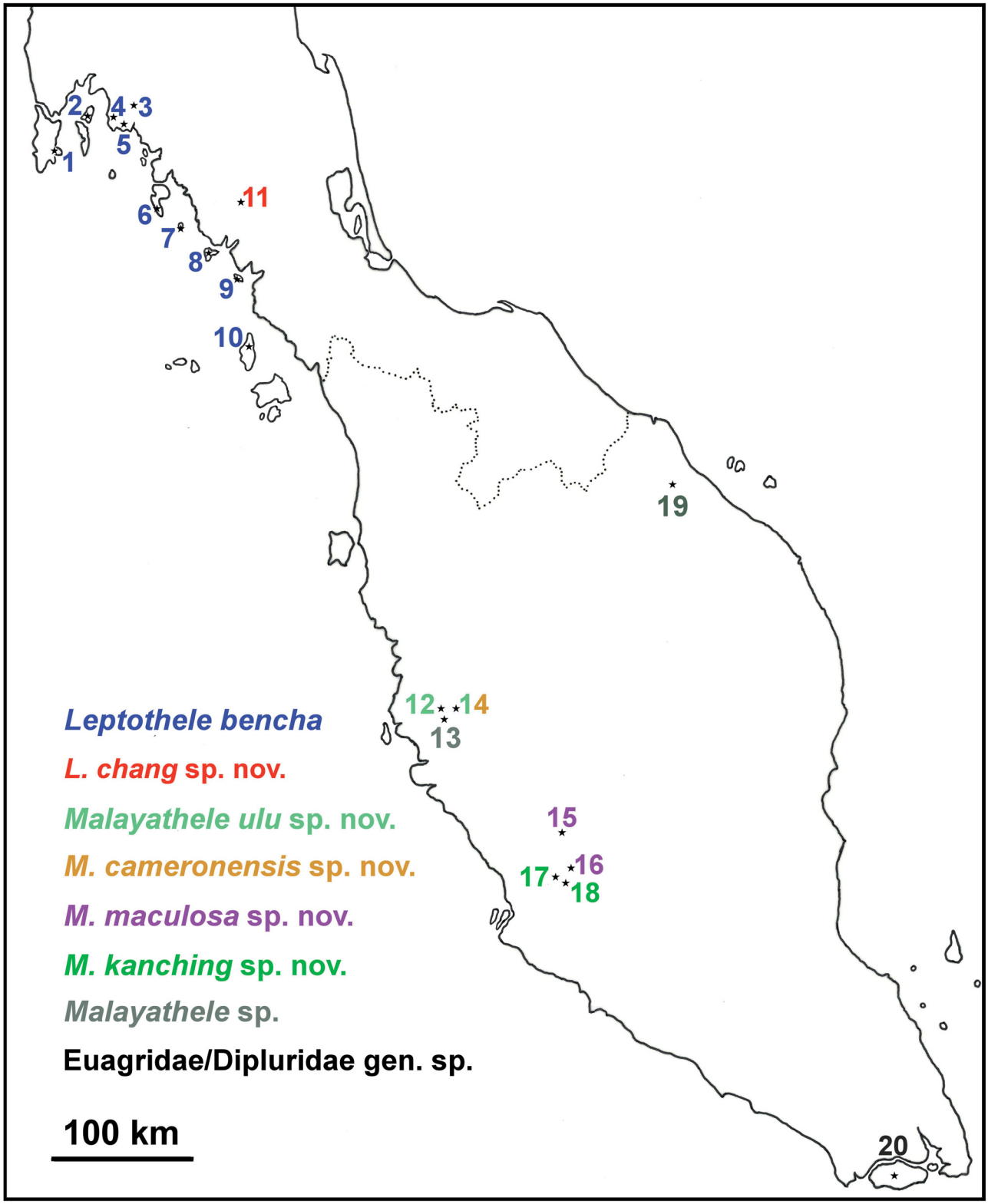

Fig. 2. Localities of *Leptothele* spp. and *Malayathele* spp. on the Thai-Malay Peninsula. The coast of Sumatra is omitted. 1 - Ko Sirey (*L. bencha*); 2 - Ko Yao Noi (*L. bencha*); 3 - Khao Phanom Bencha (*L. bencha*, type locality); 4 - Thab Khaek - Hang Nak Hill and Khlong Jilat (*L. bencha*); 5 - Ban Chong Phlie (*L. bencha*); 6 - Ko Lanta (*L. bencha*); 7 - Ko Muk (*L. bencha*); 8 - Ko Libong (*L. bencha*); 9 - Ko Sukon (*L. bencha*); 10 - Ko Tarutao (*L. bencha*); 11 - Tham Khao Chang Hai (*L. chang* sp. nov., type locality); 12 - Ulu Groh (*M. ulu* sp. nov., type locality); 13 - Chenderiang (*Malayathele* sp.); 14 - Cameron Highlands (*M. cameronensis* sp. nov., type locality; *M. ulu* sp. nov.); 15 - Fraser's Hill (*M. maculosa* sp. nov., type locality); 16 - Genting Highlands (*M. maculosa* sp. nov.); 17 - Templer Park (*M. kanching* sp. nov.; type locality); 18 - Ulu Gombak (*M. kanching* sp. nov.); 19 - Jeram Pasu Waterfall (*Malayathele* sp.); 20 - Singapore (Euagridae/Dipluridae gen. sp.).

Key to the genera of Euagridae in Asia:

1A Males with a band of elongated spinules on prolateral side of tibia II (Raven, 1981a: fig. 7), with a distinct, quite long spur (carrying megaspines) on ventral side of tibia II, and with 2-3 longitudinal keels on ventral side of metatarsus II (proventral one reduced to a small cone in *P. sayamense* Schwendinger, 2009: fig. 13I-J); patella I with a row of short, sigmoid or (rarely) curved retroventral-distal spines (Schwendinger, 2009: figs 3L, 6F, 10F, 13F, 16F); femur II with a long proventral band of hooked spinules (almost or actually reaching distal margin of leg article; Schwendinger, 2009: figs 2B, 4E, 5E, 9E, 12E, 15E, 18E); palpal tarsus with strong distal bristles (not spines; Schwendinger, 2009: fig. 2C). Females with or without secondary receptacles, if present then situated posterior of median receptacles (Schwendinger, 2009: figs 3A-I, 7, 11, 14, 17, 20; Schwendinger & Zonstein, 2011: figs 4-5, 8). Both sexes usually with spines on tarsi of posterior legs (most males of *P. suthepium* Raven & Schwendinger, 1989 and some *P. eripnastes* Schwendinger, 2009 without). Central Asia and all over Thailand..... ..... *Phyxioschema*

1B Males without a band of elongated spinules on prolateral side of tibia II (Figs 5E, 12G), with a rather indistinct short spur (carrying megaspines) on ventral side of tibia II, and with 1-2 mound-like, conical or tooth-shaped processes on ventral side of metatarsus II (exception: a short retroventral keel in *M. cameronensis* sp. nov., Fig. 11G-J); patella I with a row of long, not sigmoid bristles (Figs 6F, 8F, 11F, 13I) or with only a single curved spine retroventrally-distally (Fig. 15E); femur II with a short proventral band of hooked spinules (distant from distal margin of leg article; Figs 5F, 10B); palpal tarsus with distinct distal spines (Figs 3A, D, H, 6B-E, 8A-E, 11A-D, 15A-C). Females without secondary receptacles (Figs 4, 7, 9, 11K, 16), if exceptionally present, then situated anterior of median receptacles (Fig. 7C). Both sexes without spines on tarsi of posterior legs. Southern Thailand and Peninsular Malaysia 2

2A Small body size (carapace length in males 1.52-2.73), distal article of PLS pseudosegmented (Fig. 5I), no metatarsal preening combs in both sexes. Males with at least two megaspines and with a transversal subdistal ridge on ventral side of tibia II (Figs 3B-C, E-F, I-J, 5E, 6G-K); metatarsus II with a single conical or mound-like process on ventral side (Figs 3B-C, E-F, I-J, 5E, 6G-I); tarsi I-II not ventrally bulged (Fig. 5H). Females with quite long spermathecal trunks; stalks of median receptacles not sclerotised (Figs 4, 7). Southern Thailand ..... *Leptothele*

2B Very small body size (carapace length in males 1.11-1.44), distal article of PLS not pseudosegmented (Fig. 12J-K), metatarsal preening combs present on legs II-IV in both sexes. Males with only one ventral megaspine and without a subdistal ridge on ventral side of tibia II (Figs 8H-K, 10B, 11G-J, 12G, 13J-M, 15F-H); metatarsus II with two small conical processes, a proventral and a retroventral one (Figs 13J-K, M, 15F-H), or with only a small conical retroventral process (Fig. 8I-J), or with a small conical proventral and a keel-shaped retroventral processes (Fig. 11G-J); tarsi I-II ventrally bulged (Fig. 10D). Females with rather short spermathecal trunks; stalks of median receptacles sclerotised (Figs 9, 11K, 14, 16). Peninsular Malaysia .....*Malayathele* gen. nov.

Key to the species of *Leptothele*:

1A Small body size (carapace lengths in males 1.52-2.04). Males normally with two ventral megaspines (Fig. 3C, F; single asymmetrical exception, Fig. 3J) and always without wrinkles behind and in front of subdistal-ventral ridge on tibia II (Fig. 3C, F, J); ventral process on metatarsus II widely conical (Fig. 3B, E, I); bulbous part of palpal organ as long as wide or wider than long (Fig. 3A, D, H, G). Females with quite long and narrow spermathecal trunks; stalks of median receptacles mostly shorter than corresponding heads (Fig. 4A-D), except for females from Ko Siray (Fig. 4E-F) ..... *L. bencha*

1B Larger body size (carapace lengths in males 2.30-2.73). Males with 2-3 ventral megaspines and with wrinkles behind and in front of subdistal ridge on tibia II (Fig. 6H-K); ventral process on metatarsus II less distinct, developed as a low, wide mound (Fig. 6G); bulbous part of palpal organ longer than wide (Fig. 6A-E). Females with relatively shorter and wider spermathecal trunks; stalks of median receptacles very long and thin, almost twice of corresponding head lengths (Fig. 7) .....*L. chang* sp. nov.

vulvae quite similar to those of *Phyxioschema* females, but stalks of receptacles not sclerotised and usually no secondary receptacles present [one exception – unsymmetrical and situated anterior of median receptacle – in *L. chang* sp. nov. (Fig. 7C); secondary receptacles in *Phyxioschema*, if present, posterior of or at same level as median receptacle, see Schwendinger, 2009: figs 3A-I, 11, 17 and Schwendinger & Zonstein, 2011: figs 4-5, 8]. Metatarsal preening combs absent (present in *P. suthepium* and *P. erawan* Schwendinger, 2009, but not in other *Phyxioschema*). Distinguished from *Malayathele* gen. nov. by distal article of PLS with a pseudosegmentation (Fig. 5I cf. Fig. 12J-K) and by lacking metatarsal preening combs in both sexes; males with 2-3 (Figs 3C, F, 6H-K; exceptionally more, Fig. 3J) megaspines (only one in *Malayathele* gen. nov., Figs 8I-J, 11I-J, 13J, 15F) and a transversal subdistal ridge (Figs 3B-C, E-F, I-J, 6G-K; absent in *Malayathele* gen. nov.) on ventral side of tibia II, and with a single, widely conical or mound-like median process on metatarsus II (Figs 3B-C, E-F, I-J, 6G-I; 1-2 small conical processes or one conical process plus a short keel-shaped process in *Malayathele* gen. nov., Figs 8H-K, 11G-J, 13J-M, 15F-H); tarsi I-II not ventrally bulged (Fig. 5H cf. Fig. 10D). Females distinguished from those of *Malayathele* gen. nov. by possessing median receptacular stalks with unsclerotised walls (Figs 4, 7 cf. Figs 9, 11K, 14, 16). Revised character: teeth on unpaired leg claws either all sessile (Fig. 1F-G) or proximal teeth raised on indistinct common base (Fig. 1E, H).

Distribution: Southern Thailand (Fig. 2, localities 1-11).

Leptothele bencha Raven & Schwendinger, 1995
Figs 1E-F, 3-4

Leptothele bencha Raven & Schwendinger, 1995: 637-639, figs 2C, 3E-F, 4E, 5F-G, 9 (description of males and females).

Holotype: QMS 29275; male; THAILAND, Krabi Province, Khao Phanom Bencha National Park, near Huay To Waterfall, 8°14’16”N, 98°55’02”E, 260 m; 21.IX.1992; leg. P.J. Schwendinger.

Paratypes: QMS 29276; 3 females; same data as for holotype. – MHNG; 1 male and 1 female; same data as for holotype.

Other material examined: MHNG (sample THMA-00/14); 5 males (matured 17.VIII.2000, 24.IX.2000, beginning XII.2000), 11 females; THAILAND, Phuket Province, Ko Sirey, 7°53’10”N, 98°26’11”E, 50 m; 12.VIII.2000; leg. P.J. Schwendinger. – MHNG (sample TH-02/11); 1 male, 1 female; Ko Sirey, 30 m; 22.VIII.2002; leg. P.J. Schwendinger. – MHNG; 4 females; THAILAND, Krabi Province, Khao Phanom Bencha National Park, near Huay To Waterfall (the type locality), 260 m; 21.IX.1992; leg. P.J. Schwendinger. – MHNG (sample THA-99/1); 1 female; THAILAND, Krabi Province, Khao Phanom Bencha National Park, near Huay To Waterfall, 8°14’24”N, 98°54’56”E, 100-190 m; 11.X.1999; leg. P.J. Schwendinger. – MHNG (sample TH-07/10); 5 females; THAILAND, Phang Nga Province, Ko Yao Noi, 8°11’04”N, 98°38’02”E, 70 m; 16.VII.2007; leg. P.J. Schwendinger. – MHNG (sample TH-06/07); 2 males (one of them matured XII.2006), 2 females; THAILAND, Ko Yao Noi, near Ban An Pao, 8°09’53”N, 98°37’20”E, 150 m; 21.IX.2006; leg. P.J. Schwendinger. – MHNG (sample THMA-08/10); 2 females; THAILAND, Krabi Province & District, Khlong Jilat, 8°05’18”N, 98°52’56”E, 60 m; 16.VI.2008; leg. P.J. Schwendinger. – MHNG (sample THMA-08/07); 1 male (hatched VIII.08, matured end XII.09), 4 females; THAILAND, Krabi Province & District, Thab Khaek - Hang Nak Hill, near waterfall, 8°05’43”N, 98°45’11”E, 300 m; 13.VI.2008; leg. P.J. Schwendinger. – MHNG (sample TH-09/09); 1 female; THAILAND, Krabi Province & District, Ban Chong Phlie, 8°04’50”N, 98°49’50”E, 80 m; 13.VI.2009; leg. P.J. Schwendinger. – MHNG (sample THA-99/3); 3 males (hatched end XII.1999; matured 18.VI.2000, VII.-VIII.2000, IX.2000), 9 females; THAILAND, Krabi Province, Ko Lanta, 7°28’36”N, 99°05’25”E, 5 m; 15.X.1999; leg. P.J. Schwendinger. – MHNG (sample TH-09/03); 2 females; THAILAND, Trang Province, Ko Muk, near Morakot Cave, 7°21’52”N, 99°17’30”E, 60 m; 28.V.2009; leg. P.J. Schwendinger. – MHNG (sample TH-05/09); 4 males (one collected mature, others matured 16.IX.2005, 7.X.2005, 9.XI.2005), 11 females; THAILAND, Trang Province, Ko Libong, near Ao Tokae, 7°16’04”N, 99°22’39”E, 30 m; 20.VII.2005; leg. P.J. Schwendinger. – MHNG (sample TH-09/02); 1 male, 10 females; THAILAND, Trang Province, Ko Sukon, 7°05’51”N, 99°34’53”E, 140 m; 23.V.2009; leg. P.J. Schwendinger. – MHNG; 6 males (matured 13.II.1996, 20.IX.1996, 13.VI.1997, 10.VII.1997, 22.VIII.1997, 27.VIII.1997), 12 females; THAILAND, Satun Province, Ko Tarutao, 6°40’60”N, 99°38’47”E, 30 m; 12.I.1996; leg. P.J. Schwendinger. – THNHM; 1 male (matured 10.IX.1996), 1 female; THAILAND, Satun Province, Ko Tarutao, 30 m; 12.I.1996; leg. P.J. Schwendinger.

Extended diagnosis: Distinguished from *L. chang* sp. nov. by smaller size and darker body colour. Males with shorter bulbous part of palpal organ (Fig. 3A, D, G, H cf. Fig. 6A-E), normally only with two ventral megaspines [Fig. 3C, F (one exception with four megaspines, Fig. 3J); 2-3 megaspines in *L. chang* sp. nov., Fig. 6H-K] and without wrinkles behind and in front of subdistal ventral ridge on tibia II (Fig. 3C, F, J; present in *L. chang* sp. nov., Fig. 6H-K), and with a more distinct, conical ventral process on metatarsus

II (Fig. 3B, E, I cf. Fig. 6G). Females with longer and narrower spermathecal trunks and with much shorter stalks of median receptacles (Fig. 4 cf. Fig. 7).

Variation: Carapace lengths in males (n = 25) range 1.52-2.04, carapace widths 1.29-1.78. The smallest male examined is the paratype deposited in the MHNG, the largest male is from Thab Khaek - Hang Nak Hill. The largest female (from Khlong Jilat) has a 2.94 long and 2.49 wide carapace. Among the 25 males examined 24 have two ventral megaspines on the tibiae of both legs II. Only a single male (from Ko Sukon) has a relatively low ventral spur carrying four megaspines on its left tibia II (Fig. 3I-J), which is clearly abnormal; its right tibia II is equipped with a more elevated (i.e. normal for this species) ventral spur carrying two megaspines. The holotype (not re-examined) appears to lack any proximal spines on the ventral side of metatarsus I of at least the right leg (Raven & Schwendinger, 1995: 638, fig. 9F), but all males examined for this study (including a paratype) have 1-2 weak spines at that position. A male from Ko Libong has a slightly longer bulbal part of the palpal organ (Fig. 3H) than the other conspecific males examined.

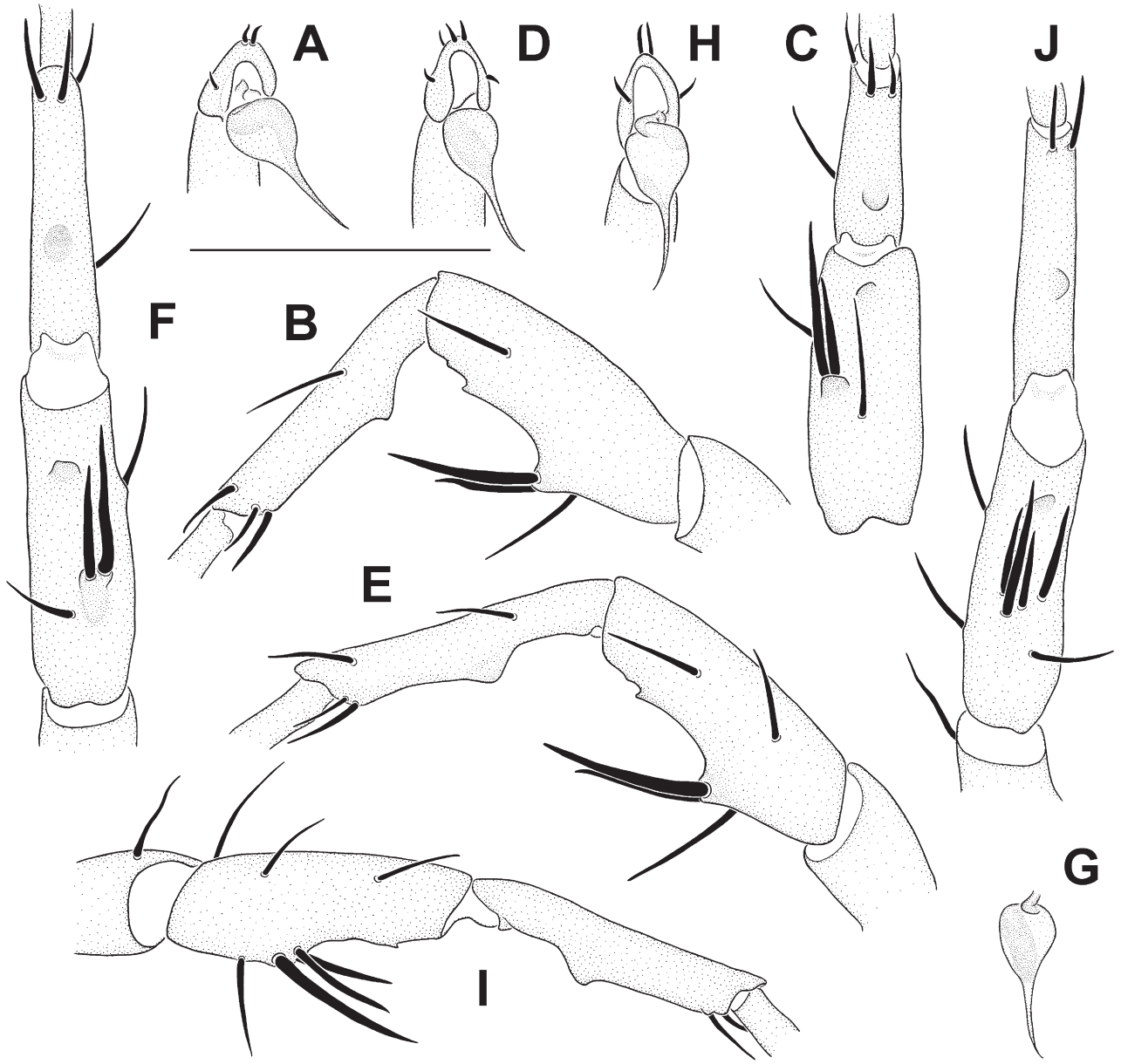

Fig. 3. *Leptothele bencha*; males from Ko Sirey (A-B), Ko Tarutao (C-F, G, showing two specimens), Ko Libong (H) and Ko Sukon (I-J). (A, D, H) Distal part of palp, ventral view. (B, E) Right tibia and metatarsus II, prolateral view. (C) Left tibia and metatarsus II, ventral view. (F) Right tibia and metatarsus II, ventral view. (G) Palpal organ, ventral view. (I) Left tibia and metatarsus II of aberrant specimen, prolateral view. (J) Same, ventral view. Scale line 1.0 mm.

The vulvae of two females from Ko Siray (the northernmost locality of this species; Fig. 4E-F) have median receptacles with relatively smaller heads and much longer stalks, as well as lateral receptacles with a much narrower apex than females from the other localities (Fig. 4A-D). Despite these quite pronounced differences in female genitalia, the males from Ko Siray show no relevant distinctions from the other males examined (Fig. 3A-B cf. Fig. 3C-J). We consider this as a geographical form that does not deserve specific or subspecific rank.

Remark: The "small pointed protuberances" on the spermathecae and receptacles of two paratypes shown in Raven & Schwendinger (1995: 638, fig. 9J-K) are actually the cuticular bases of gland ducts that empty through pores into the interior of the spermathecae (see also Schwendinger & Ono, 2011: figs 56-58, 61-64). These gland duct bases are clearly visible on exuviae (Fig. 7A, showing *L. chang* sp. nov.), but not on unstained vulvae dissected from specimens (only the pores are visible there, Fig. 4, see also Fig. 7B-D showing *L. chang* sp. nov.). These protuberances thus have no or only very limited taxonomic value.

Distribution: This species is known from 11 localities near the Andaman coast of southern Thailand (Fig. 2, localities 1-10, 4 refers to two nearby localities). Four sites (including the type locality) lie on the mainland in Krabi Province, on or near the coast, the others are on islands quite close to the mainland (the most distant is

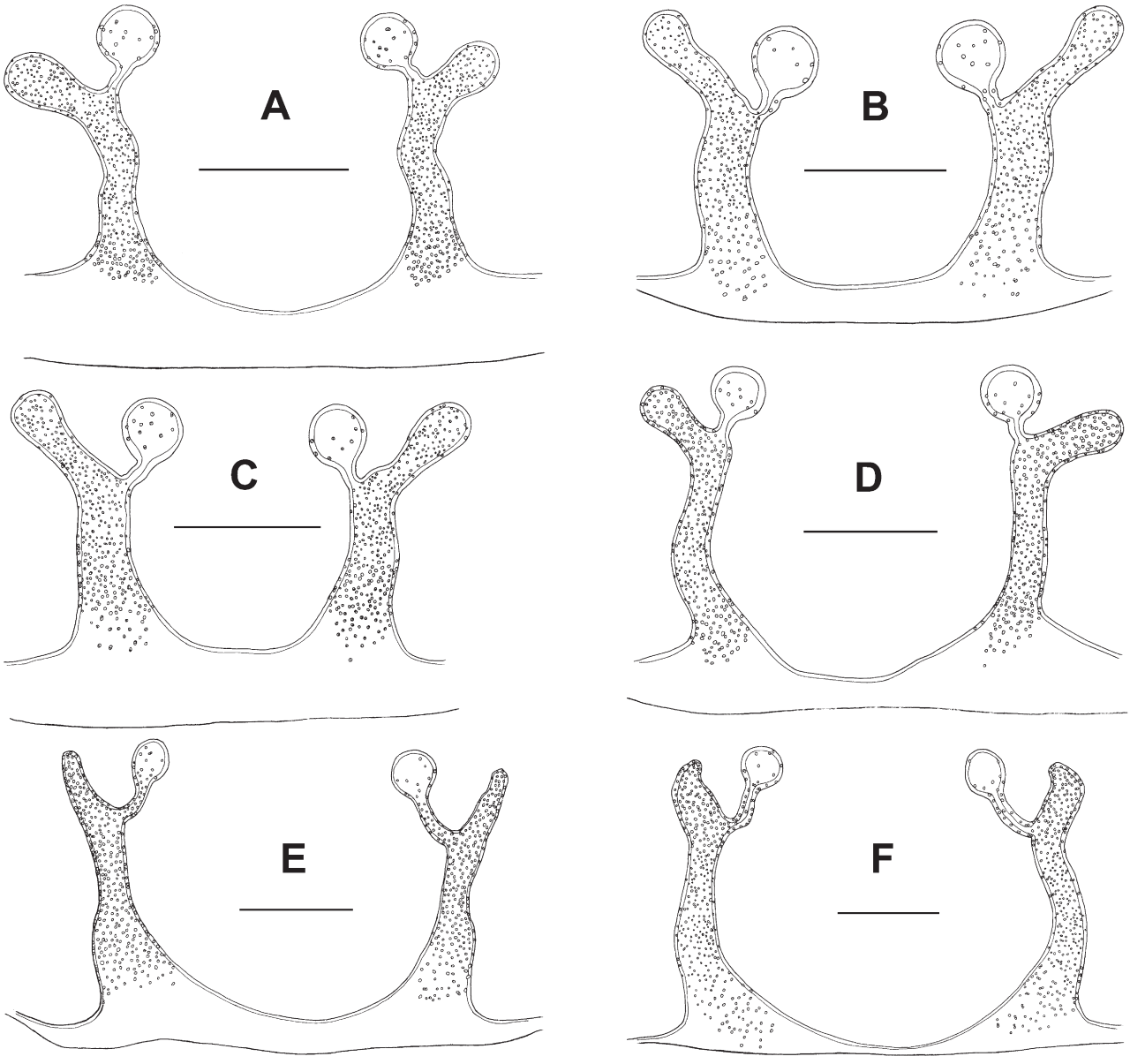

Fig. 4. *Leptothele bencha*; vulvae of six females, dorsal view. (A) Female from Ko Libong. (B-C) Two females from Ko Tarutao. (D) Female from Ko Lanta. (E-F) Two females from Ko Siray. Scale lines 0.1 mm.

Ko Tarutao, about 17 km offshore, Fig. 2, locality 10). Despite extensive sieving of forest litter on Phuket Island and at numerous additional forest sites in southern Thailand, no other conspecific specimens were collected.

Biology: Most spiders examined were collected by sieving leaf litter in semi-evergreen rain forests. At Thab Khaek - Hang Nak Hill they were found in tiny tunnel webs in holes of earthbanks on roadside and in holes and in moss on granite rock close to a small waterfall in the forest. This species does not have a clear preference for limestone (as *Phyxioschema* spp. in southern Thailand have): only at Ban Chong Phlie was a female collected from a web in a crack of a limestone bolder. Four females from Ko Libong produced egg sacs in captivity in late August 2005; from one of them spiderlings hatched 22 days later. In captivity – but not in nature – females from Ko Libong and Ko Tarutao camouflaged the white lenticular egg sacs by attaching soil particles to their surface. No limited mating period could be observed. Some males from the northern localities were collected as adults in the field between late June and early December, others collected as immatures matured in captivity during the same period of the year. On Ko Sukon a mature male was collected in late May, and males collected on Ko Tarutao in early January matured in February and between June and November.

In captivity a pair from Ko Tarutao mated in the following manner: The male courted in the web of the female by quivering and tiptoeing. He approached the female directly, abruptly and forcefully pulled her towards him, locked his tibia II spur and megaspines onto her femur II which was bent sideward at a right angle, whilst his legs I bent her legs I and palps far backwards. In this locked position, which lasted for 21 minutes, the male alternately inserted his palpal organs several times. The pair then separated abruptly and the female chased the male away. That female produced a first egg sac exactly one month later and the spiderlings hatched two weeks afterwards. A second egg sac was produced later. Another female (collected gravid) from Ko Tarutao constructed seven egg sacs in a succession. A total of 33 egg sacs were preserved, each containing 5-17 eggs and early instar spiderlings; eight eggs was the most common count (n = 7).

Leptothele chang Schwendinger, sp. nov.

Figs 1G-H, K, 5-7

Holotype: MHNG (sample THMA-00/08); male (matured 24.I.2001); THAILAND, Trang Province, Nayong District, Tham Khao Chang Hai, 7°35'24"N, 99°40'05"E, 50 m; 1. & 5.VIII.2000; leg. P.J. Schwendinger.

Paratypes: MHNG; 3 males (matured 13.I., 8.II., 10.IX.2001) and 13 females (allotype moulted 17.I.2001); same collecting data as for holotype. – THNHM; 1 male (matured 2.IV.2001) and 1 female; same collecting data as for holotype.

Etymology: Thai: chang (pronounced with a high tone and a long "a") = elephant. The epithet refers to the type locality, the Tham Khao Chang Hai (= cave of the mountain in which an elephant vanished) and to the size of the new species: it is the larger one of the two known *Leptothele* species. In colloquial Thai a big or tall person is often referred to as "tua chang" = with the body of an elephant.

Diagnosis: Distinguished from *L. bencha* by larger size and paler body colouration. Males with longer bulbous part of palpal organ (Fig. 6A-E cf. Fig. 3A, D, G; H being an exception), with 2-3 ventral megaspines on tibia II (Fig. 6G-K; in *L. bencha* normally two, Fig. 3B-C, E-F, four being an exception, Fig. 3I-J), with wrinkles in front and behind subdistal-ventral ridge on tibia II (Fig. 6H-K; wrinkles absent in *L. bencha*), and with a less pronounced, lower and basally wider ventral process on metatarsus II (Fig. 6G cf. Fig. 3B, E, I). Females with relatively shorter and wider spermathecae, median receptacles with very long and thin stalks (Fig. 7 cf. Fig. 4).

Description: MALE (holotype). Colour in alcohol (slightly darker in life) mostly light brown; sternum, opisthosoma and ventral side of body and limbs slightly lighter; prolateral zone of palpal coxae and all membranes cream-coloured; eye mound black (Fig. 5A-B).

Body 6.70 long. Carapace 2.58 long, 2.30 wide, oval, almost flat, thoracic part slightly higher than cephalic part, quite densely covered with fine, slightly wavy hairs, longest and strongest ones on posterior margin; a few bristles in front of eye mound; two long bristles in front of pitlike fovea.

Eyes on low mound; eye group 0.26 long, anterior eye row slightly procurved, 0.45 wide, posterior eye row slightly recurved, 0.48 wide. Eye diameters and interdistances: AME 0.09, ALE 0.17, PME 0.10, PLE 0.11; AME-AME 0.02, PME-PME 0.13. MOQ 0.20 long, 0.20 wide anteriorly, 0.35 posteriorly.

Chelicerae weak, without intercheliceral tumescence, each groove with 10 teeth on promargin and a short row of tiny medioproximal denticles. Palpal coxae 0.65 long, 0.35 wide; anterior lobe indistinct, with serrula composed of a band of denticles (see Fig. 1K showing female paratype); no cuspules. Labium 0.15 long, 0.50 wide, without cuspules; anterior edge distinctly setose, followed by pallid zone without setae; posterior part pigmented, with few short setae. Sternum 1.30 long, 1.20 wide, cordate; labiosternal suture fused with anterior pair of sigilla, three pairs of free sigilla indistinct and marginal.

Palps (Fig. 6C-E): Measurements: total length 3.75 (1.35 + 0.90 + 0.90 + 0.60). Several long strong bristles dorsally and ventrally on all articles, especially on femur and tibia; tarsus with two dorsodistal spines, plus one weak spine (or strong bristle) on each side disto-laterally. Trichobothria: 6+7 in two rows on tibiae, 8 in an irregular row on tarsi. Palpal organ with a narrow kidney-shaped subtegulum, a much longer and wider, asymmetrically pyriform tegulum, and a quite long (about as long as tegulum), thin embolus tapering to a slightly curved tip. Legs 2134. Leg I 8.80 long (2.45 + 1.30 + 1.90 + 1.90 + 1.25); leg II 8.18 long (2.35 + 1.20 + 1.53 + 1.80 + 1.30); leg III 8.85 long (2.30 + 1.10 + 1.80 + 2.25 + 1.40); leg IV 11.13 long (2.85 + 1.25 + 2.50 + 2.98 + 1.55). All tarsi evenly deep for entire length (not bulged on ventral side), not pseudosegmented and without spines (Fig. 5H); with a few scopuliform hairs (see Fig. 10C-E for *Malayathele cameronensis* sp. nov.) in distal portion,

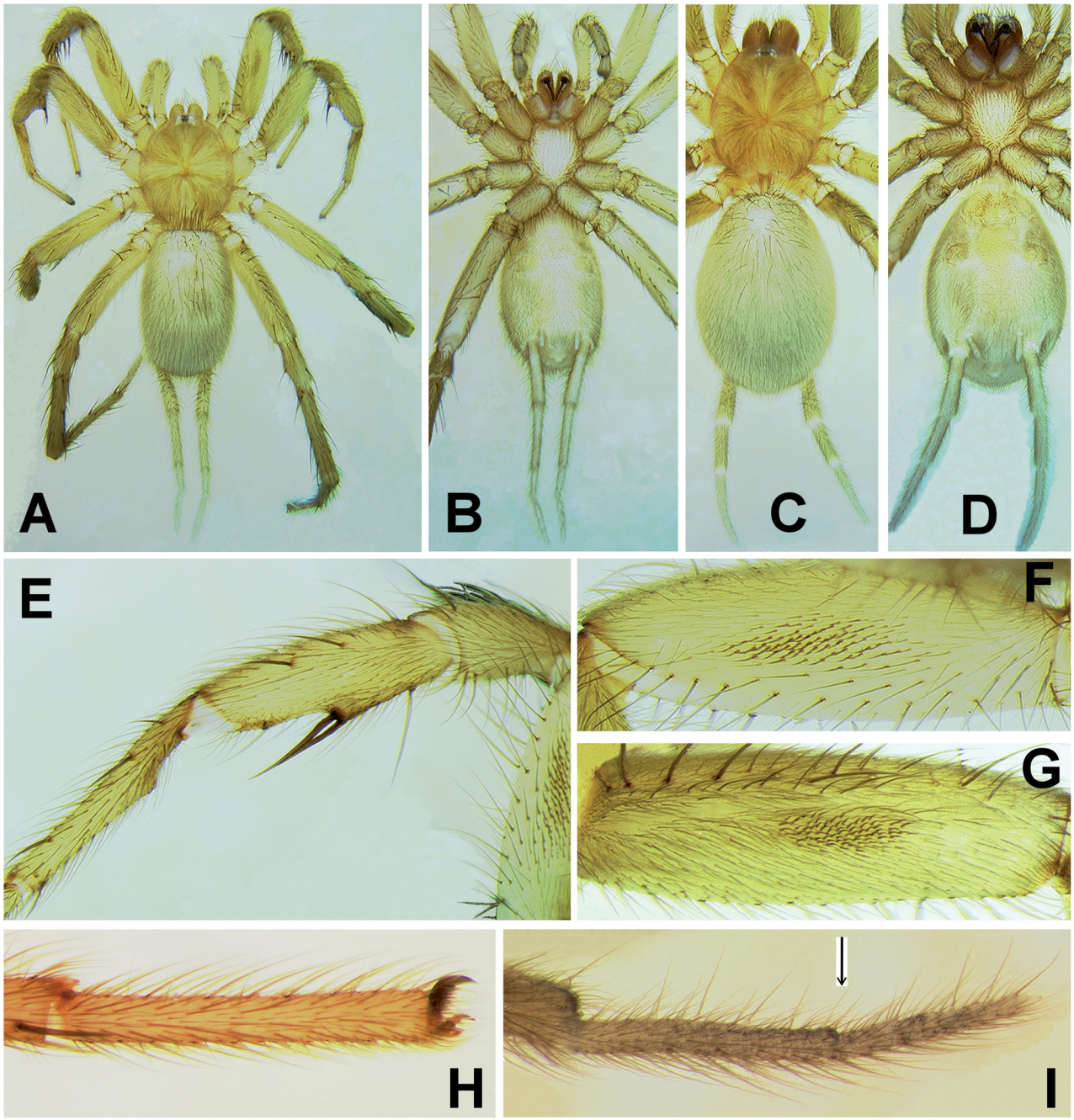

Fig. 5. *Leptothele chang* sp. nov.; male holotype (A-B, E-H), female allotype (C-D) and male paratype (I). (A, C) Habitus, dorsal view. (B, D) Habitus, ventral view. (E) Femur to metatarsus of right leg II, prolateral view. (F) Right femur II, proventral view. (G) Right femur I, retrodorsal view. (H) Tarsus I, lateral view. (I) Distal part of median article and entire distal article of PLS, lateral view; arrow indicating pseudosegmentation. Not to scale.

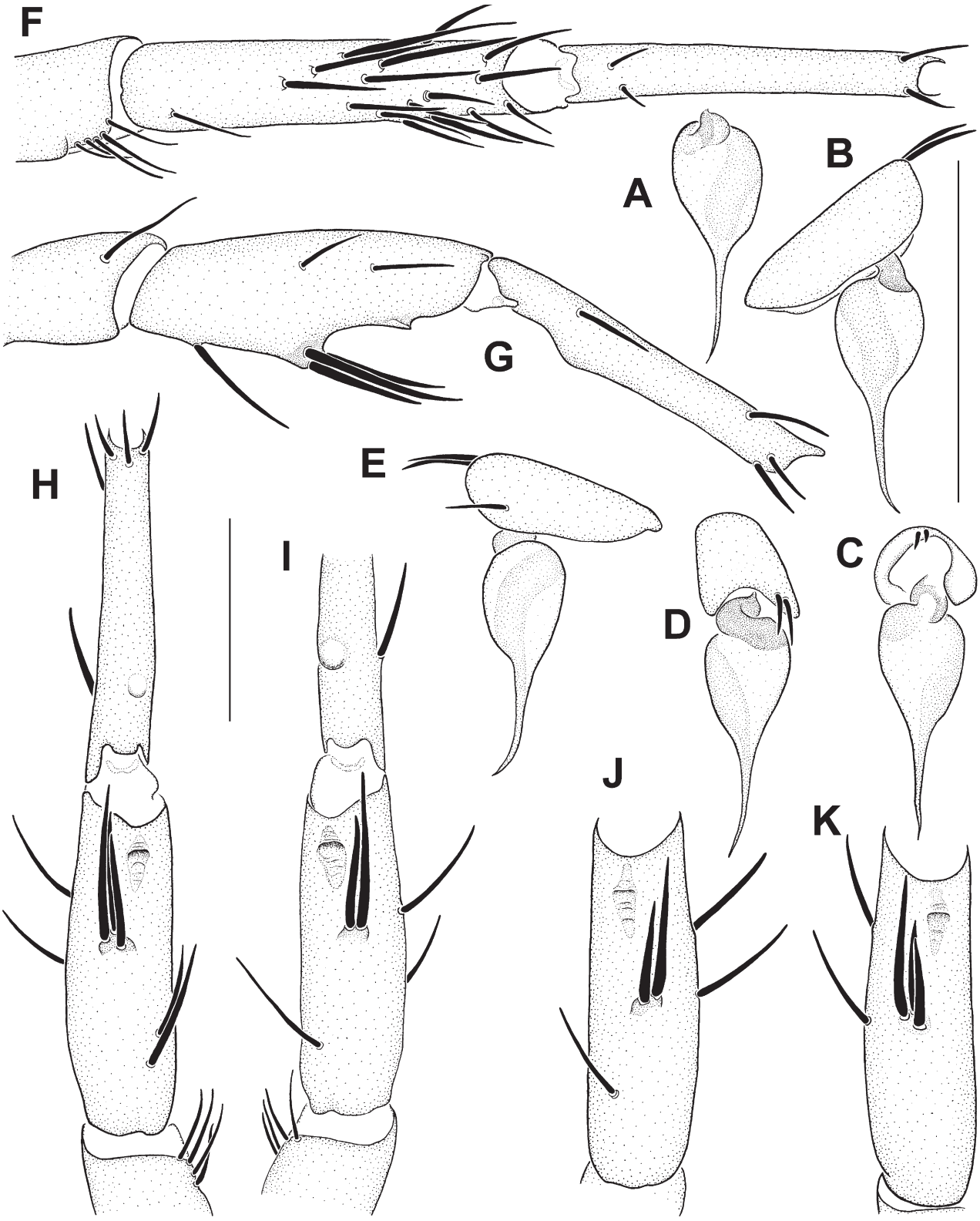

Fig. 6. *Leptothele chang* sp. nov.; male paratype (A-B, J-K) and male holotype (C-I). (A) Right palpal organ, ventral view. (B) Left palpal organ and palpal tarsus, prolateral view. (C) Right palpal organ and palpal tarsus, ventral view. (D) Left palpal organ and palpal tarsus, ventral view. (E) Right palpal organ and palpal tarsus, prolateral view. (F) Patella to metatarsus of left leg I, ventral view. (G) Patella to metatarsus of left leg II, prolateral view. (H) Same, ventral view. (I) Same of right leg II, ventral view. (J) Right tibia II, ventral view. (K) Left tibia II, ventral view. Scale lines 1.0 mm (A-E; F-K).

on anterior tarsi more distinct than on posterior tarsi. Metatarsal preening combs absent. Leg I: Metatarsus with 1/2 proximoventral spines and 2 distoventral spines; tibia not incrassate, not ventrally flattened, carrying 1 prolateral spine and 14/16 ventral spines; patella with a row of bristles retroventrally-distally (Fig. 6F); femur in median third with a short band of hooked spinules retrodorsally (Fig. 5G). Leg II: Ventral side of metatarsus with a low, basally wide, mound-like process in proximal third (Figs 5E, 6G-I). Tibia slightly incrassate, without band of elongate spinules on prolateral side (Figs 5E, 6G); ventral spur low, carrying 2/3 megaspines; low, sharp transversal ridge subdistally on ventral side of tibia lying in a lanceolate area covered by wrinkles (Fig. 6G-I). Band of hooked spinules proventrally on femur short, distant from distal margin of leg article (Fig. 5F).

Spines, trichobothria and claws of legs. All femora with numerous long strong bristles dorsally; I: patella d1; tibia p1, v14/16; metatarsus v3/4. II: patella d1; tibia p2, v2/3 (megaspines); metatarsus p2, v3. III: patella d3; tibia d2, p2, r1/2, v6; metatarsus d6, v6. IV: patella d3; tibia d1, p2, r2, v5/6; metatarsus d7/8, v5/7. Trichobothria: 7+7 in two rows on tibiae, 12 in a single row on metatarsi, 8 in a single row on tarsi. Paired tarsal claws with 11-14 teeth in one row on anterior legs, 9-11 on posterior legs; unpaired claw with 6 teeth on legs I-III, 5 on leg IV.

Opisthosoma 3.45 long, 2.25 wide; densely covered with fine adpressed grey hairs interspersed with longer brown bristles (longest on anterior margin). PMS 0.50 long, 0.10 wide in the middle, separated from each other by 0.90; PLS 3.65 long (proximal article 1.10 long and 0.30 wide, median article 1.15 long and 0.20 wide, distal article 1.4 long and 0.13 wide in the middle), separated from each other by 0.68. Distal article of PLS with a pseudosegmentation at mid-point (see Fig. 5I showing male paratype).

FEMALE (allotype). Colour in alcohol (slightly darker in life) mostly light reddish brown; chelicerae distinctly darker, opisthosoma and ventral side of body and limbs (especially sternum) lighter (Fig. 5C-D).

Body 9.63 long. Carapace 3.54 long, 3.07 wide, oval, almost flat, thoracic part as high as cephalic part, with hairs as in male. Eye group 0.29 long, anterior eye row slightly procurved, 0.55 wide, posterior eye row slightly recurved, 0.63 wide. Eye diameters and interdistances: AME 0.11, ALE 0.17, PME 0.11, PLE 0.12; AME-AME 0.06, PME-PME 0.24. MOQ 0.23 long, 0.26 wide anteriorly, 0.47 posteriorly.

Chelicerae stronger than in male, each groove with 12/13 teeth on promargin and a short row of 13/14 tiny medioproximal denticles. Palpal coxae 0.96 long, 0.59 wide; anterior lobe indistinct, serrula as in Fig. 1K; no cuspules. Labium 0.22 long, 0.68 wide, without cuspules. Sternum 1.65 long, 1.71 wide, cordate, with distinct labiosternal suture (fused with anterior pair of sigillae) and three free pairs of indistinct marginal sigilla.

Palps 5.81 long (1.89 + 1.09 + 1.40 + 1.43). Spination: several long strong bristles dorsally and ventrally on all

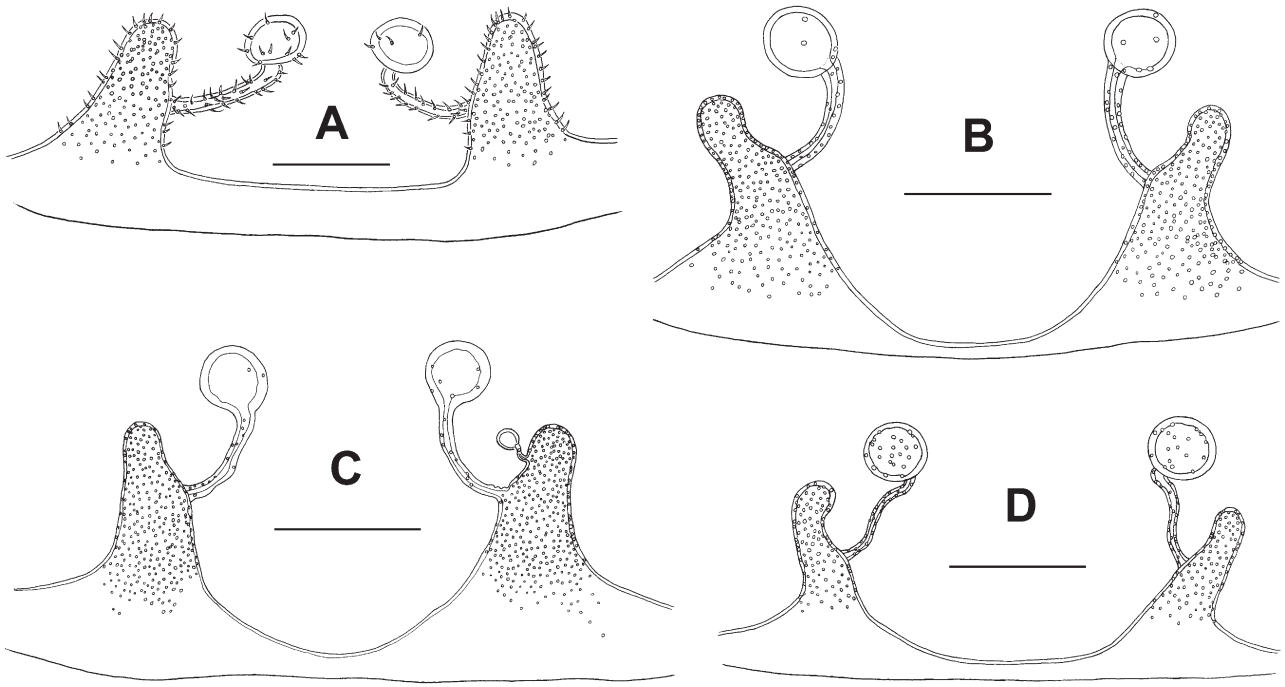

Fig. 7. *Leptothele chang* sp. nov.; vulvae of female allotype (A) and of three female paratypes (B-D), dorsal view. (A) Drawn from exuvia of allotype; cuticular gland duct bases visible. (B-D) Drawn from dissected paratypes; gland duct bases not visible but gland pores instead. (C) Right lateral receptacle carrying a tiny secondary receptacle. Scale lines 0.1 mm.

articles, especially on femur and tibia; tarsus with 8/9 spines ventrally. Trichobothria: 6/7+6/7 in two rows on tibiae, 8 in an irregular row on tarsi.

Legs 2134. Leg I 9.28 long (2.67 + 1.52 + 1.99 + 1.89 + 1.21); leg II 8.94 long (2.55 + 1.43 + 1.86 + 1.89 + 1.21); leg III 9.58 long (2.55 + 1.40 + 1.93 + 2.33 + 1.37); leg IV 11.73 long (3.04 + 1.55 + 2.61 + 2.98 + 1.55). Tarsi without spines and without discernible scopuliform hairs. Metatarsal preening combs absent.

Spines, trichobothria and claws of legs. All femora with numerous long strong bristles dorsally; I: patella d2; tibia p3, v4/6; metatarsus v6. II: patella d2; tibia p3, v5/6; metatarsus p2, v5/6. III: patella d3; tibia d2, p2/3, r2/3, v5/6; metatarsus d5, p1/2, r1/2, v6. IV: patella d3; tibia d2/3, p2, r3, v5/6; metatarsus d5, p2, r1/2, v6. Trichobothria: 7-8+7-8 in two rows on tibiae; 13-16 in one row on metatarsi; 8-9 in one row on tarsi. Paired tarsal claws with 12-15 teeth in a row on anterior legs, 10-12 on posterior legs; unpaired claw with 6 teeth on anterior legs, 5 on posteriors (see Fig. 1G-H showing female paratype).

Opisthosoma 5.40 long, 3.76 wide, with hairs as in male. PMS 0.68 long, 0.19 wide in the middle, separated from each other by 1.18; PLS 5.49 long (proximal article 1.77 long and 0.43 wide, median article 1.55 long and 0.34 wide, distal article 2.17 long and 0.22 wide in the middle), separated from each other by 1.43. Distal article of PLS with a pseudosegmentation at mid-point.

Spermathecae medium-long and moderately wide; lateral receptacles with narrowly rounded heads and no stalks; median receptacles with globular heads and very long (about twice as long as heads) and thin stalks, their walls not sclerotised (Fig. 7A).

Variation: Carapace lengths in males (n = 5) range 2.30-2.73, carapace width 2.03-2.43. In the largest female the carapace length is 3.57, the carapace width 3.10; the smallest reproductive female (constructed three egg sacs) has a carapace length of 2.48 and a carapace width of 2.26. Two males (including the holotype) have three ventral megaspines on the left tibia II and two megaspines on the right tibia II; the other three males have two megaspines on both tibiae II. Variation in the number of ventral megaspines (two probably being more common than three) on tibia II in this species appears to be much greater than in *L. bencha* (only a single, asymmetrical case among 24 specimens examined, and that is a very unusual tibia II with a very low ventral spur carrying four megaspines). A similar tibia II megaspine variation is known from *Phyxioschema suthepium* (45 males with 2+2, 2 with 2+3, 1 with 3+3; n = 48), *P. huberi* (5 males with 2+2, 3 with 3+3, 1 with 3+4, 1 with 4+5; n = 10) and *P. eripnastes* (3 males with 2+2, 1 with 2+3; n = 4) (Schwendinger, 2009). There are 11-16 ventral and 1-2 prolateral spines on tibia I, and metatarsus I has mostly two (on one leg three) distal spines, 0-2 median spines and 1-2 proximal spines. One male paratype has three dorsodistal spines (two strong, one weak) on both palpal tarsi, all other males have only two such spines. Variation in the shape of the vulva of four females is shown in Fig. 7. The allotype has lateral receptacles without recognizable stalks (Fig. 7A), whereas in the other females the stalks are more or less constricted (Fig. 7B-D). One of the females examined has a tiny secondary receptacle situated anterior of the median receptacle on one of its spermathecae (Fig. 7C).

Distribution and habitat: *Leptothele chang* sp. nov. is only known from its type locality in southern Thailand (Fig. 2, locality 11). Unlike the closely related *L. bencha*, the new species occurs quite far away from the coast, at the entrance of a limestone cave, but seemingly not in the dark parts of the cave or in the surroundings of the cave.

Biology: The type specimens were all collected from irregular tunnel webs spun between discarded wooden poles in the oligophotic zone and in holes and cracks in dry soil at the entrance of a limestone cave. When collected at the beginning of August, one female had a hemispherical egg sac (containing 28 eggs) suspended in the aerial portion of its web. Another female built an egg sac in captivity at the beginning of October of the same year. Six preserved egg sacs, four of them resulting from mating in captivity during the following year, contain 14-44 eggs and early instar spiderlings. These egg sacs were built 20-24 days after mating (4 observations). Females built up to three egg sacs and moulted three times per year. Males matured in captivity in January, February, April and November. There appears to be no limited mating period. Mating was performed as described for *L. bencha* in this text, with the tibia II coupling spurs and megaspines of the male locking onto femora II of the female and pushing them to the side. Then he very abruptly and forcefully pulled her towards him whilst bending her prosoma and anterior limbs backwards into the mating position. The first act of mating lasted only three minutes, but was repeated three times consecutively. The second copula of the same male, but with another female, was performed only once and it lasted for 20 minutes.

Malayathele Schwendinger, gen. nov.

Etymology: "Malaya" is one of the old names for Malaysia, the only county from where the new spider genus is known with certainty; "thele" (Greek for "nipple"; figurative for nipple-shaped or wart-shaped structures), refers to the long posterior lateral spinnerets of these spiders and to the close relationship with the genus *Leptothele*.

Type species: *Malayathele kanching* sp. nov., by present designation.

Diagnosis: Distinguished from *Phyxioschema* by characters given in the key to Euagridae genera of Asia, most prominently by small body size in both sexes, and by tibia II of males without elongate spinules on prolateral side (Figs 10B, 12G) and with only a single megaspine on a low ventromedian spur (Figs 8H-K, 10B, 11G-J, 12G, 13J-M, 15F-H). Distinguished from *Leptothele* by metatarsal preening combs present on legs II-IV in both sexes. Males with only one megaspine and no transversal subdistal ridge on ventral side of tibia II, and mostly with two small conical processes (a retroventral and a proventral one, Figs 12G, 13J-M, 15F-H; the proventral one absent in *M. ulu* sp. nov., Fig. 8I-J, the retroventral one keel-shaped in *M. cameronensis* sp. nov., Figs 10B, 11G-J) on metatarsus II; tarsi I-II ventrally bulged (Fig. 10D). Females distinguished by possessing median receptacular stalks with sclerotised walls (Figs 9, 11K, 14, 16).

Description: Body very small (carapace length in males 1.11-1.44), with relatively thin hair cover on carapace, no colour pattern (Fig. 12E-F, H-I) or a dark mottled pattern on hirsute opisthosoma (Fig. 12A-D). Fovea pitlike, with a pair of long straight bristles anterior of it (Fig. 12A, C, E, H). Eye group distinctly wider than long, anterior eye row slightly or not procurved, posterior eye row moderately or slightly recurved. Clypeus present, shorter than eye group length (Fig. 12A, C, E, H).

Chelicerae small, without rastellum, with teeth only on promargin of groove; intercheliceral tumescence absent. Palpal coxae rectangular, quite wide and posteriorly arched, with a bulging ventral surface, its prolateral zone glabrous and lightly pigmented; no cuspules present (Fig. 12B, F, I); anterior lobe indistinct, carrying a serrula formed by a narrow band of tiny denticles (Fig. 1L). Labium much wider than long, without cuspules; anterior edge carrying a row of bristles followed by a pallid zone without setae; posterior part pigmented, with few short setae. Sternum cordate; post-labial sigilla medially fused with quite long labiosternal suture; remaining three pairs of sigilla indiscernible.

Legs moderately long and thin, with spines on patellae to metatarsi; all tarsi aspinose and not pseudosegmented; tarsi I-II of males more or less distinctly bulged on ventral side and carrying a few scopuliform hairs (Fig. 10C-E); metatarsi II-IV of both sexes with preening combs; filiform trichobothria in two dorsal rows on tibiae, and in one row on metatarsi and tarsi; tarsal organ inconspicuous, cowpad-shaped, quite remote from distal margin of tarsus. Leg I of males with only two (Fig. 11E-F) or 6-7 (Figs 8F-G, 13H-I, 15D-E) ventral spines on cylindrical, not incrassate tibia; patella with a series of bristles (Figs 8F, 10A, 11F, 13I) or with a single spine (Fig. 15E) retroventrally-distally. Leg II of males with a small conical proventral process and a small conical retroventral processes (Figs 12G, 13J-K, M, 15F-H), or with only a small conical retroventral process (Fig. 8I-J), or with a small conical proventral process and a longer keel-shaped retroventral process (Figs 10B, 11G-J) on metatarsus; tibia with a single, slightly curved or slightly sigmoid megaspine on a low medioventral spur; area

Key to the species of *Malayathele* gen. nov.:

1A Males with corkscrew-shaped embolus (Fig. 11A-D), with only two ventral spines on metatarsus I (Figs 10A, 11E-F) and with retroventral process on metatarsus II developed as a short blunt keel (Fig. 11G-J). Females with very wide, quite short spermathecal trunks bearing rudimentary (reduced to a boss) lateral receptacles (Fig. 11K) .... *M. cameronensis* sp. nov.

1B Males with more or less strongly curved embolus (Figs 8A-E, 13A-G, 15A-C), with 6-7 ventral spines on metatarsus I (Figs 8F-G, 13H-I, 15D-E) and with retroventral process on metatarsus II developed as a small cone (Figs 8H-K, 13J-M, 15F-H). Females with narrower spermathecal trunks and with well-developed lateral receptacles (Figs 9, 14, 16) 2

2A Males with only slightly curved embolus (Fig. 8A-E) and with only one ventral process (the retroventral one) on metatarsus II (Fig. 8H-K). Females without dark pattern on opisthosoma; stalks of median receptacles longer than corresponding heads (Fig. 9) ..... *M. ulu* sp. nov.

2B Males with slightly or strongly curved embolus (Figs 13A-G, 15A-C) and with two ventral processes on metatarsus II (Figs 12G, 13J-M, 15F-H). Females with more or less distinct dark pattern on opisthosoma (Fig. 12A-D); stalks of median receptacles as long as or shorter than corresponding heads (Figs 14, 16) 3

3A Males with distally strongly curved embolus (Fig. 15A-C); patella I retroventrally-distally with a single spine (Fig. 15E). Females with dark pattern of opisthosoma indistinct and restricted to dorsal side; spermathecal trunks rectangular, lateral receptacles bent ventrad, their stalks not constricted (Fig. 16) ..... *M. kanching* sp. nov.

3B Males with only slightly curved embolus (Fig. 13A-G); patella I retroventrally-distally with a series of bristles (Fig. 13I). Females with dark pattern of opisthosoma distinct and extending to posteroventral side (Fig. 12A-D); spermathecal trunks conical, lateral receptacles directed anteriad, their stalks clearly constricted (Fig. 14) .... *M. maculosa* sp. nov.

between ventral spur and distoventral margin of tibia slightly flattened and wrinkled (Figs 8H-K, 10B, 11H-J, 12G, 13J-M; indistinct wrinkles in *M. kanching* sp. nov., Fig. 15F-H). Paired leg claws with a single row of 4-12 teeth; unpaired claws with 1-3 quite long teeth, the basal ones on posterior legs set on a common base (Figs 1I-J, 10C).

Palpal tarsus of males with two apical lobes, the retrodorsal lobe larger than the prodorsal one and carrying 2-3 distal spines (as in *Leptothele*); palpal organ with short lenticular subtegulum and wide bulbous tegular part, embolic part thin and apically pointed, either slightly curved (Figs 8A-E, 13A-G), strongly curved (Fig. 15A-C) or corkscrew-shaped (Fig. 11A-D).

Four widely separated spinnerets; no australotheline crescent at base of PLS; PMS short and with only one article; PLS long and composed of three articles (Fig. 12B, D, E-F, H-I); distal article of PLS not pseudosegmented, with a reduced pigmentation in posterior half (Fig. 12J-K).

Vulva with two spermathecae, each carrying two receptacles; lateral receptacles anteriad-directed (Figs 9, 11K, 14) or ventrad-directed (Fig. 16), perforated by numerous gland pores for their entire length, with more or less distinctly constricted, unsclerotised stalks (Figs 9, 14), without discernible stalks (Fig. 16) or altogether strongly reduced (Fig. 11K); median receptacles always clearly separated into a more or less strongly curved or twisted stalk with sclerotised walls and a bulbous or globular head perforated by few or no pores (Figs 9, 11K, 14, 16).

Species and distribution: *Malayathele cameronensis* sp. nov., *M. kanching* sp. nov., *M. maculosa* sp. nov. and *M. ulu* sp. nov., all from the Titiwangsa Mountain Range (= Main Range, Banjaran Besar) of Peninsular Malaysia and its foothills (Fig. 2, localities 12-18). At least one undescribed species in the northeastern part of the country (Fig. 2, locality 19).

Malayathele ulu Schwendinger, sp. nov.

Figs 1I-J, 8-9

Holotype: MHNG (sample SIM-01/14); male; MALAYSIA, Perak, E of Gopeng, Ulu Groh (= Geroh), 4°26'50''N, 101°16'07''E, rain forest, 500 m; 21.I.1994; leg. P.J. Schwendinger.

Paratypes: MHNG; 5 females; same collecting data as for holotype. – MHNG; 1 male, 3 females; MALAYSIA, Pahang, Cameron Highlands, Tanah Rata, 4°28.4-28.7'N, 101°21.6-22.1'E, 1470-1550 m; 25.IV.-15.V.2009; leg. P. Banar. – MHNG (sample WM93-15); 1 female; Pahang, Cameron Highlands, trails 4 and 13; 23.III.1993; leg. I. Löbl & F. Calame. – MHNG; 7 females; Pahang, Cameron Highlands, Orang Asli village near Gunung Perdah, 4°29.2'N, 101°22.1'E, 1575 m; 2.-14.V.2009; leg. P. Banar. – MHNG; 4 females, 5 juveniles; Pahang, Cameron Highlands, near Tanah Rata, Parit Falls, 4°28.5'N, 101°23'E, about 1500 m; 26.IV.2009; leg. P. Banar. – MHNG; 1 female; Pahang, Cameron Highlands, Tanah Rata, 4300 feet; 7.VIII.1972; leg. T. Jaccoud. – MHNG (sample I 82); 1 female; Pahang, Cameron Highlands, Tanah Rata; 24.III.1977; leg. T. Jaccoud & P. Marcuard.

Other material: MHNG; 3 juveniles; MALAYSIA, Perak, Gopeng, Ulu Groh, 4°26'50"N, 101°16'07"E, 500 m; 21.I.1994; leg. P.J. Schwendinger. – MHNG; 3 juveniles; Pahang, Cameron Highlands, Tanah Rata, 4°28.4-28.7'N, 101°21.6-22.1'E, 1470-1550 m; 25.IV.-15.V.2009; leg. P. Banar.

Etymology: The species epithet (derived from "hulu") is a Malay noun that means "upriver" and usually refers to a remote, undeveloped area. It is a reference to the type locality.

Diagnosis: Males distinguished from those of the other three congeneric species by the absence of a proventral process on metatarsus II (Fig. 8H-K), from that of *M. cameronensis* sp. nov. (which occurs in the same area) additionally by numerous (6-7 instead of only two) ventral spines on tibia I (Fig. 8F-G cf. Fig. 11E-F) and by a small conical retroventral process (instead of a keel-shaped one) on metatarsus II (Fig. 8H-K); additionally distinguished from males of *M. kanching* sp. nov. by a series of bristles (instead of a single spine) retroventrally-distally on patella I (Fig. 8F cf. Fig. 15E). Females distinguished from those of all other congeners by possessing median receptacles with long stalks (distinctly longer than corresponding heads; Fig. 9).

Description: MALE (holotype). Colour in alcohol (slightly darker in life) mostly very light brown; palpal organ and cheliceral claws darker; eye mound black; no dark pattern on opisthosoma.

Body 3.06 long. Carapace 1.29 long, 1.03 wide, oval, thoracic part slightly higher than cephalic part, sparsely covered with fine wavy hairs, a few stronger ones in front of eye mound and between eye mound and fovea; two long bristles in front of pitlike fovea. Eyes on low mound; eye group 0.13 long, anterior eye row slightly procurved, 0.21 wide, posterior eye row moderately recurved, 0.22 wide. Eye diameters and interdistances: AME 0.04, ALE 0.07, PME 0.06, PLE 0.07; AME-AME 0.02, PME-PME 0.02. MOQ 0.11 long, 0.07 wide anteriorly, 0.13 posteriorly.

Chelicerae weak, grooves with 13/14 teeth on promargin. Palpal coxae 0.33 long, 0.21 wide. Labium 0.13 long, 0.24 wide. Sternum 0.71 long, 0.65 wide.

Palps (Fig. 8C-E). Measurements: total length 1.81 (0.65 + 0.38 + 0.45 + 0.33). Spination: several long strong bristles dorsally and ventrally on all articles, especially on femur and tibia; tarsus with 2 dorsodistal spines, plus one short strong bristle prolaterally-distally and one retrolaterally-distally. Palpal organ with gently curved embolus tapering to a pointed apex.

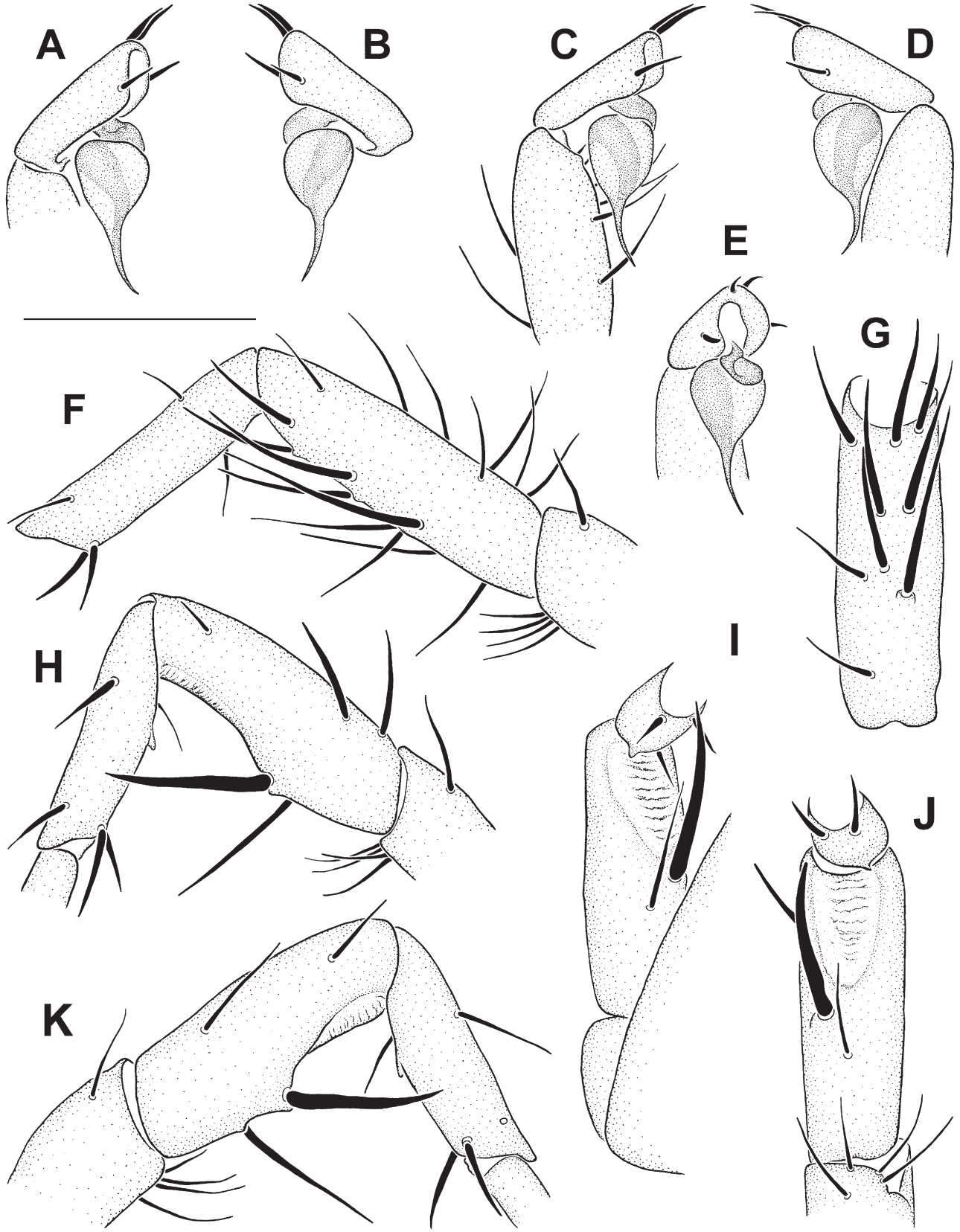

Fig. 8. *Malayathele ulu* sp. nov.; male paratype (A-B, J-K) and male holotype (C-I). (A, C) Distal part of left palp, prolateral view. (B, D) Same of right palp, prolateral view. (E) Distal part of left palp, ventral view. (F) Patella to metatarsus of right leg I, prolateral view. (G) Right tibia I, ventral view. (H) Patella to metatarsus of right leg II, prolateral view. (I) Same, retroventral view. (J) Patella to metatarsus of left leg II, ventral view. (K) Same, prolateral view. Scale line 0.5 mm.

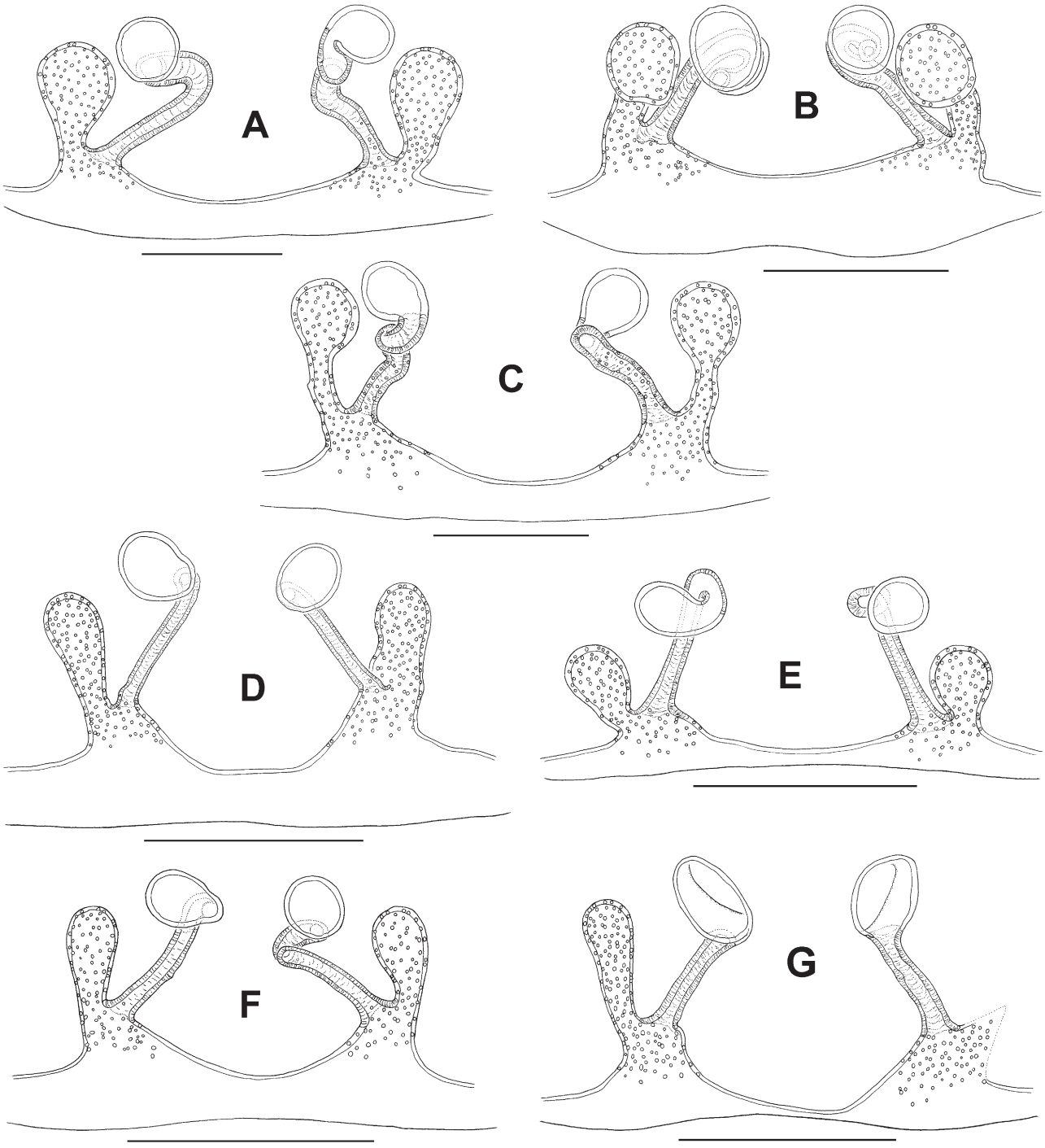

Fig. 9. *Malayathele ulu* sp. nov.; vulvae of seven females (all drawn from dissected specimens), dorsal view. (A) Allotype. (B-C) Paratypes from the type locality (Ulu Groh). (D-G) Paratypes from the Cameron Highlands: Parit Falls, 26.IV.2009 (D); Tanah Rata, 7.VIII.1972 (E); Gunung Perdah, 2.-14.V.2009 (F); trails 4 & 13, 23.III.1993, heads of median receptacles collapsed and right lateral receptacle torn off (G). Scale lines 0.1 mm.

Legs 3214. Leg I 3.42 long (0.98 + 0.60 + 0.70 + 0.63 + 0.51); leg II 3.18 long (0.93 + 0.55 + 0.61 + 0.58 + 0.51); leg III 3.13 long (0.83 + 0.48 + 0.58 + 0.70 + 0.54); leg IV 3.97 long (1.05 + 0.60 + 0.80 + 0.91 + 0.61). Tarsi not pseudosegmented and without spines; with a few scopuliform hairs in distal portion of anterior legs. Metatarsal preening combs on legs II-IV. Leg I: Tibia carrying 7 ventral spines plus 2 strong ventral bristles (Fig. 8G). Femur with quite wide band of hooked spinules retrodorsally. Leg II: Metatarsus with only a small conical retroventral process (Fig. 8H-I). Tibia with a low ventral spur carrying a single megaspine, plus a long strong ventral bristle more proximally; a series of fine transversal wrinkles subdistally on ventral side (Fig. 8H-I). Band of hooked spinules proventrally on femur II longer than corresponding band on femur I, the spinules more widely spaced.

Spines, trichobothria and claws of legs. All femora with numerous long strong bristles dorsally; I: tibia v7; metatarsus v2. II: tibia p2, v1 (megaspine); metatarsus v2. III: patella d1, r1; tibia d2, p2, r2, v5; metatarsus d4, p2, v3. IV: patella d1, r1; tibia d2, p2, r2, v5; metatarsus d5, p2, v4. Trichobothria not counted (difficult to see). Paired tarsal claws with 7-9 teeth on anterior legs, 5-7 on posterior legs; unpaired tarsal claws with 2-3 teeth.

Opisthosoma 1.36 long, 0.83 wide; densely covered with fine adpressed grey hairs interspersed with longer dark bristles (longest on anterior margin). PMS 0.23 long, 0.06 wide in the middle, separated from each other by 0.25. PLS 1.49 long (proximal article 0.49 long and 0.15 wide, median article 0.50 long and 0.13 wide, distal article 0.50 long and 0.10 wide in the middle), separated from each other by 0.45.

FEMALE (allotype). Colour in alcohol (slightly darker in life) as in male but slightly darker; no dark colour pattern on opisthosoma.

Body 4.43 long. Carapace 1.65 long, 1.29 wide. Eye group 0.16 long, anterior eye row slightly procurved, 0.20 wide, posterior eye row moderately recurved, 0.23 wide. Eye diameters and interdistances: AME 0.03, ALE 0.10, PME 0.08, PLE 0.12; AME-AME 0.02, PME-PME 0.04. MOQ 0.11 long, 0.10 wide anteriorly, 0.17 posteriorly.

Chelicerae stronger than in male, grooves with 14/15 teeth on promargin. Palpal coxae 0.44 long, 0.30 wide. Labium 0.11 long, 0.33 wide. Sternum 0.89 long, 0.81 wide.

Palps. Total length 2.36 (0.78 + 0.48 + 0.54 + 0.56). Several long strong bristles dorsally and ventrally on all articles, especially on femur and tibia; tarsus with five distinct ventral spines. Claws with 11 denticles.

Legs 3=214. Leg I 3.73 long (1.11 + 0.67 + 0.76 + 0.66 + 0.53); leg II 3.41 long (1.00 + 0.59 + 0.65 + 0.63 + 0.54); leg III 3.41 long (0.96 + 0.55 + 0.61 + 0.73 + 0.56); leg IV 4.29 long (1.20 + 0.70 + 0.84 + 0.96 + 0.59). Tarsi not pseudosegmented and without spines; without scopuliform hairs. Metatarsal preening combs on legs II-IV.

Spines, trichobothria and claws of legs. All femora with numerous long strong bristles dorsally; I: patella p2 (strong bristles); tibia v4/5 (strong bristles); metatarsus v2 (plus v2 strong bristles). II: patella p2 (strong bristles); tibia p2, v5 (strong bristles); metatarsus p2 (strong bristles), v2 (plus v2 strong bristles). III: patella d1 r1; tibia d2, p2, r2, v4 (plus v1 strong bristle); metatarsus d4, 2p, v5. IV: patella d1 r1; tibia d1, p2, r2, v5 (plus v1 strong bristle); metatarsus d5, p2, v4. Trichobothria not counted (difficult to see). Paired tarsal claws with 10-12 teeth on anterior legs, 8-10 on posterior legs; unpaired tarsal claws with 2-3 teeth (Fig. 1I-J showing different female).

Opisthosoma 2.30 long, 1.60 wide. PMS 0.28 long, 0.07 wide in the middle, separated from each other by 0.45. PLS 1.44 long (proximal article 0.50 long and 0.19 wide, median article 0.44 long and 0.16 wide, distal article 0.50 long and 0.11 wide in the middle), separated from each other by 0.65.

Spermathecae quite narrow; all receptacles with distinct stalks and pyriform heads; median receptacles much longer than lateral ones, their stalks thin and slightly twisted, with sclerotized walls; lateral receptacles with voluminous heads and short stalks, their walls not sclerotised (Fig. 9A).

Variation: Carapace length in males (n = 2) range 1.29-1.39, carapace width 1.03-1.06. Both males have the left leg I missing and carry seven ventral spines on the right tibia I. The largest female (from the type locality) has a 1.75 long and 1.35 wide carapace. In the male holotype the thoracic region of the carapace is slightly higher than the cephalic region, whereas in the male paratype both regions are equally high. For a slight variation in the proportions of the palpal organs see Fig. 8A-E. A stronger variation in the shape of the vulvae is shown in Fig. 9. In females from the Cameron Highlands the median receptacular stalks appear to be mostly straight and the lateral receptacular heads quite narrow (Fig. 9D-G), whereas in females from the type locality the median receptacular stalks are more strongly bent and twisted and the lateral receptacular heads are wider (Fig. 9A-C). These different vulva types are here considered as expressions of a lowland and an upland form, not of different subspecies. No taxonomically relevant differences in the characters of males from both forms were found (Fig. 8).

Distribution: This species occurs in the lowlands at the foot of the Cameron Highlands (Ulu Groh) and at altitudes of about 1500 m near Tanah Rata in the Cameron Highlands (Fig. 2, localities 12 and 14). It very likely also occurs at Chenderiang, a second lowland locality south of Ulu Groh (Fig. 2, locality 13). It would be interesting to investigate if and to what degree the lowland and upland populations are geographically and genetically separated from each other.

Biology: The spiders examined were collected by sieving ground litter in rain forests.

Malayathele cameronensis Schwendinger, sp. nov.

Figs 10-11

Holotype: MHNG; male; MALAYSIA, Pahang, Cameron Highlands, near Tanah Rata, Gunung Jasar, 4°28.4-28.7'N, 101°21.6-22.1'E, 1470-1700 m; 18.IV.-11.V.2009; leg. P. Banar.

Allotype: MHNG; 1 female; same collecting data as for holotype.

Other material: MHNG; 2 juveniles; collected together with the types.

Etymology: The species epithet is a Latinised adjective referring to the type locality of this species.

Diagnosis: Male distinguished from those of the other three congeneric species by the presence of a corkscrew-shaped embolus (Fig. 11A-D) and of a keel-shaped retroventral process on metatarsus II (Fig. 11G-J), tibia I with only two ventral spines (Fig. 11E-F); additionally distinguished from males of *M. ulu* sp. nov. by the presence of two (instead of one) ventral processes on metatarsus II (Fig. 11G-J cf. Fig. 8I-J), and from males of *M. kanching* sp. nov. by a series of bristles (instead of a single spine) retroventrally-distally on patella I (Fig. 11F cf. Fig. 15E). Female distinguished from those of all other congeners by possessing very wide spermathecal trunks with reduced, boss-like lateral receptacles and with strongly convoluted, quite wide and strongly sclerotised stalks of the median receptacles (Fig. 11K); additionally distinguished from females of *M. maculosa* sp. nov. (and to a lesser extent also of *M. kanching* sp. nov.) by the lack of a dark colour pattern on the opisthosoma.

Description: MALE (holotype). Colour in alcohol mostly light brown; sternum and opisthosoma (including spinnerets) lighter; palpal organ and cheliceral claws darker; eye mound black.

Body 3.13 long. Carapace 1.46 long, 1.18 wide, oval, thoracic part equally high as cephalic part; few hairs present (many abraded during sieving from leaf litter), a few stronger ones in front of eye mound and in two paramedian rows behind it; pits of two bristles in front of pitlike fovea. Eyes on low mound; eye group 0.20 long, anterior eye row slightly procurved, 0.29 wide, posterior eye row moderately recurved, 0.32 wide. Eye diameters and interdistances: AME 0.05, ALE 0.14, PME 0.09, PLE 0.11; AME-AME 0.02, PME-PME 0.05. MOQ 0.12 long, 0.10 wide anteriorly, 0.20 posteriorly.

Chelicerae weak, grooves with over 10 teeth on promargin (not all visible). Palpal coxae 0.40 long, 0.26 wide. Labium 0.10 long, 0.29 wide. Sternum 0.84 long, 0.78 wide.

Palps (Fig. 11A-D). Total length 2.05 (0.71 + 0.46 + 0.53 + 0.35). Several long strong bristles dorsally and ventrally on all articles, especially on femur and tibia; tarsus with 2 dorsodistal spines, plus one short and rather indistinct (in comparison with males of other congeners) strong bristle prolaterally-distally and retrolaterally-distally. Palpal organ with corkscrew-shaped embolus.

Legs 3214. Leg I 3.97 long (1.14 + 0.69 + 0.83 + 0.75 + 0.56); leg II 3.51 long (1.05 + 0.63 + 0.65 + 0.68 + 0.50); leg III 3.46 long (0.98 + 0.54 + 0.65 + 0.78 + 0.51); leg IV 4.68 long (1.25 + 0.69 + 0.98 + 1.11 + 0.65). Tarsi not pseudosegmented and without spines; with a few scopuliform hairs in distal portion of anterior legs (Fig. 10C-E). Metatarsal preening combs on legs II-IV. Leg I: Tibia carrying only 2 ventral spines plus 5 strong ventral bristles (Fig. 11E-F; one spine fallen off on left tibia, Fig. 10A). Femur with quite short band of hooked spinules retrodorsally (Fig. 10A). Leg II: Metatarsus with two small ventral processes, the retroventral one a low, short longitudinal keel situated subproximally, the proventral one a small cone situated more distally (Figs 10B, 11G-J). Tibia with a low ventral spur carrying a single megaspine plus a long strong ventral bristle more proximally; a series of fine transversal wrinkles subdistally on ventral side (Figs 10B, 11G-J). Band of hooked spinules proventrally on femur II slightly longer than corresponding band on femur I but not reaching distal margin of article, the spinules more widely spaced (Fig. 10B cf. Fig. 10A).

Spines, trichobothria and claws of legs. All femora with numerous long strong bristles dorsally; I: tibia v2; metatarsus v1. II: tibia p2, v1 (megaspine); metatarsus v1. III: patella d1, r1; tibia d2, p2, r2, v4; metatarsus d4, p2, v2. IV: patella d1, r1; tibia d2, p2, r2, v4; metatarsus d5, p1, r1, v3. Trichobothria not counted (difficult to see). Paired tarsal claws with 6-8 teeth on anterior legs, 4-5 on posterior legs; unpaired tarsal claws with 2-3 teeth.

Opisthosoma 1.38 long, 0.95 wide; most hairs abraded, some long dark bristles remaining on anterior margin. PMS 0.26 long, 0.09 wide in the middle, separated from each other by 0.23. PLS 1.28 long (proximal article 0.48 long and 0.18 wide, median article 0.36 long and 0.14 wide, distal article 0.44 long and 0.09 wide in the middle), separated from each other by 0.40.

FEMALE (allotype). Colour in alcohol as in male; no dark colour pattern on opisthosoma discernible.

Body 3.20 long. Carapace 1.38 long, 1.15 wide; thoracic part at same level as cephalic part; only few hairs present (abraded during sieving?), a few stronger ones in front of eye mound and in two paramedian rows behind it; a distinct pit of a single bristle in front of pitlike fovea. Eye group 0.16 long, anterior eye row essentially straight, 0.24 wide, posterior eye row moderately recurved, 0.26 wide. Eye diameters and interdistances: AME 0.03, ALE 0.12, PME 0.08, PLE 0.09; AME-AME 0.03, PME-PME 0.05. MOQ 0.09 long, 0.08 wide anteriorly, 0.17 posteriorly.

Chelicerae stronger than in male, grooves with 13 teeth on promargin. Palpal coxae 0.40 long, 0.26 wide. Labium 0.10 long, 0.29 wide. Sternum 0.79 long, 0.80 wide.

Palps. Total length 2.04 (0.69 + 0.40 + 0.44 + 0.51). No spines, but several long strong bristles dorsally and ventrally on all articles, especially on femur and tibia; tarsus with three strong bristles ventrally. Claws with about 12 teeth.

Legs 32(?)14. Leg I 3.24 long (0.95 + 0.60 + 0.64 + 0.60 + 0.45); leg II missing on both sides; leg III 2.89 long (0.84 + 0.49 + 0.51 + 0.61 + 0.44); leg IV 3.75 long (1.09 + 0.61 + 0.75 + 0.80 + 0.50). Tarsi not pseudosegmented and without spines; without scopuliform hairs. Metatarsal preening combs on legs (II?)III-IV.

Spines, trichobothria and claws of legs. All femora with numerous long strong bristles dorsally; I: metatarsus v2 (plus v2 strong bristles). II: missing. III: patella d2 r1; tibia d3, p2, r2, v4; metatarsus d4, p1, v3. IV: patella d1 r1; tibia d1/2, p2, r2, v5; metatarsus d4/5, p1, v5. Trichobothria not counted (difficult to see). Paired tarsal claws with about 8 teeth on anterior legs and 5 on posterior legs; unpaired tarsal claws with 2-3 teeth.

Opisthosoma 1.40 long, 1.10 wide. PMS 0.25 long, 0.09 wide in the middle, separated from each other by 0.24. PLS 1.29 long (proximal article 0.45 long and 0.16 wide, median article 0.44 long and 0.14 wide, distal article 0.40 long and 0.10 wide in the middle), separated from each other by 0.48.

Vulva with very wide spermathecal trunks; lateral receptacles strongly reduced, boss-like; median receptacles with wide, strongly sclerotised, quite wide and strongly convoluted stalks, these seemingly (to be confirmed when additional females become available) originating on dorsal side of spermathecal trunk (Fig. 11K; in all congeners on ventral or prolateral side).

Variation: The larger one of the two juveniles has two paramedian rows of relatively long bristles between the eye mound and the fovea. The rest of the carapace is only sparsely covered with fine hairs. This is probably the normal hair cover of this species.

Biology: The specimens examined were sieved from the leaf litter of a montane rain forest.

Distribution: *Malayathele cameronensis* sp. nov. is

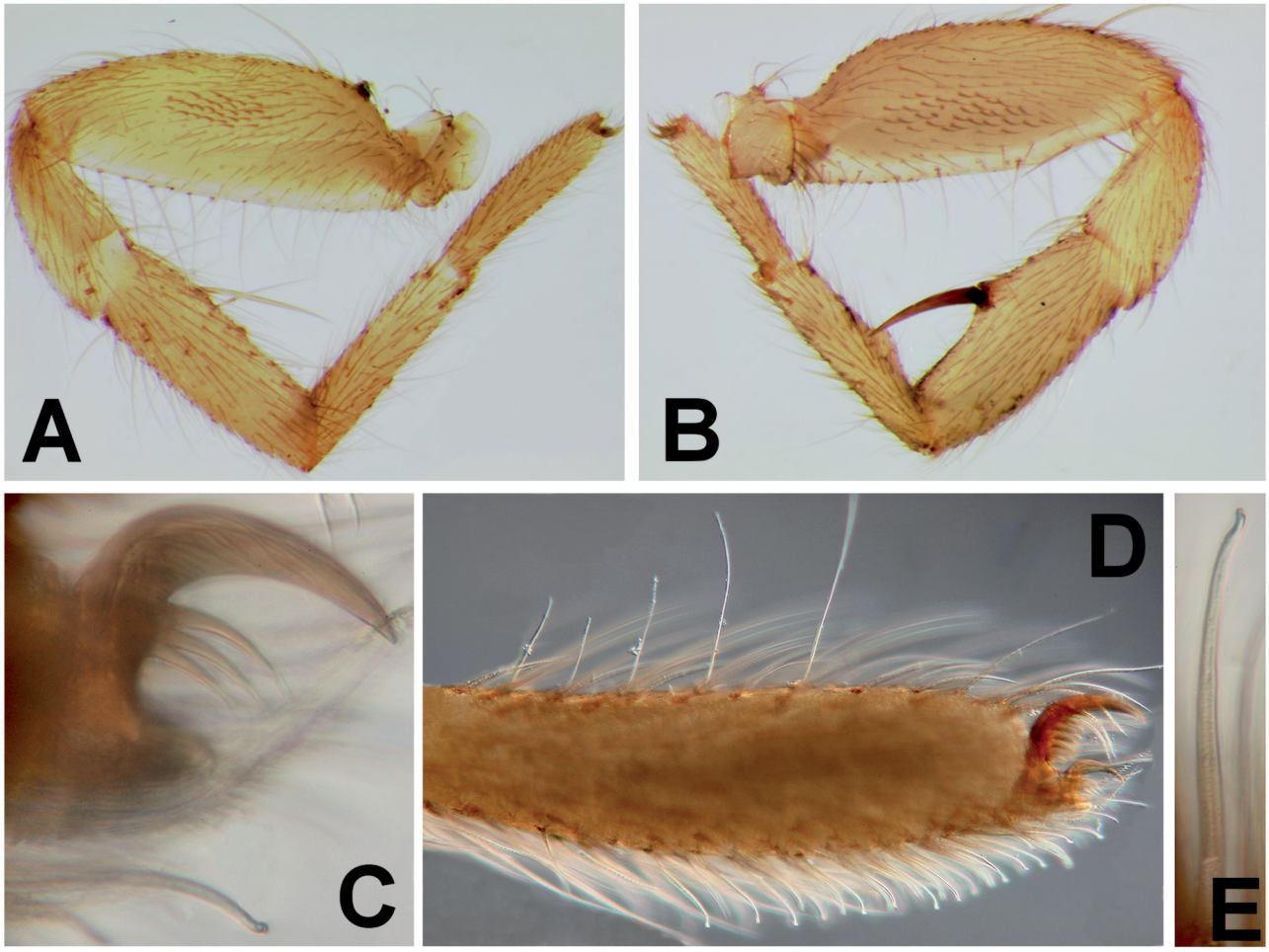

Fig. 10. *Malayathele cameronensis* sp. nov., male holotype. (A) Left leg I, retrolateral view; one ventral spine on tibia fallen off. (B) Left leg II, prolateral view. (C) Unpaired claw and scopuliform hairs of left leg II, prolateral view. (D) Ventrally bulged tarsus of left leg II, prolateral view. (E) Scopuliform hair on left tarsus II. Not to scale.

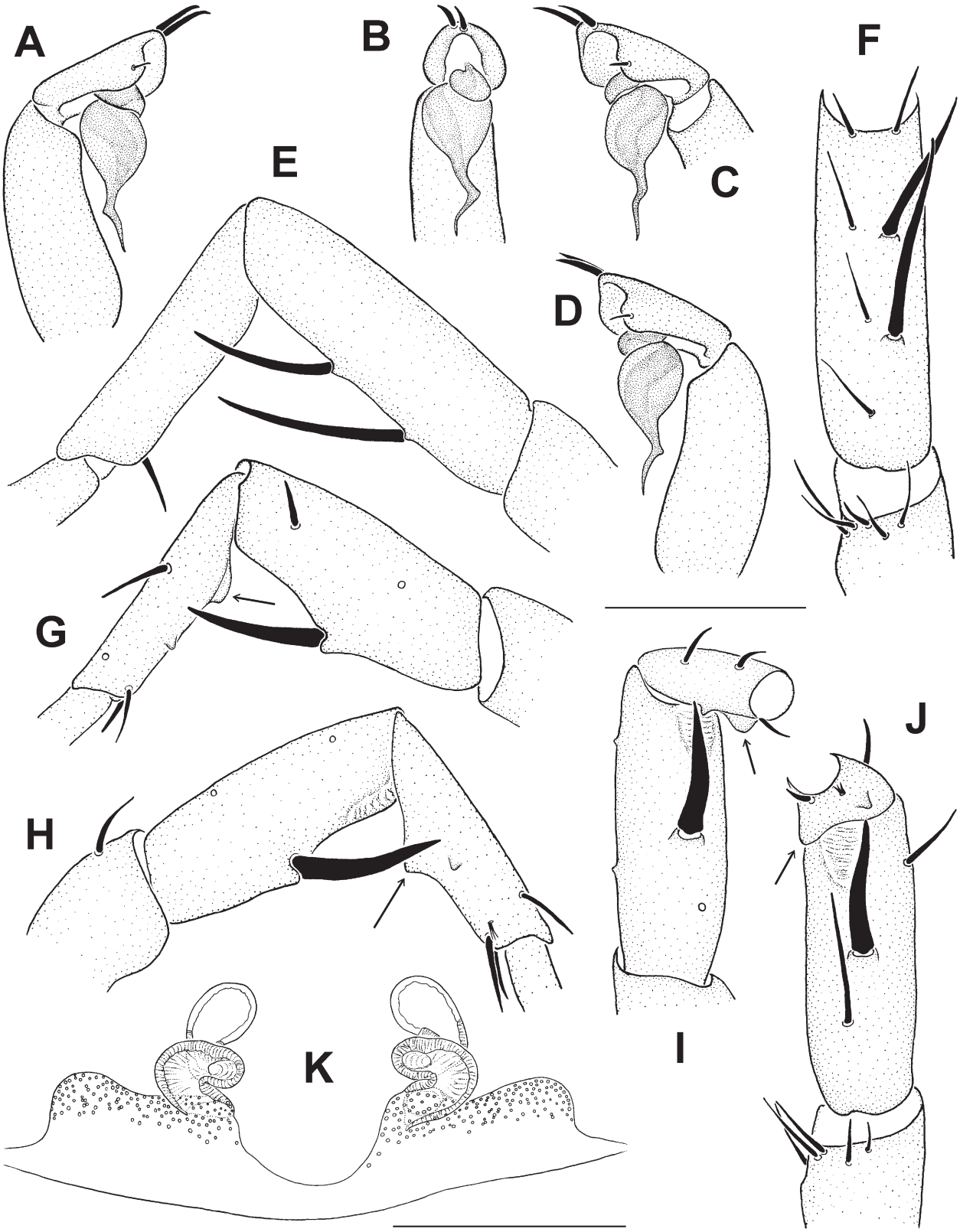

Fig. 11. *Malayathele cameronensis* sp. nov., male holotype (A-J) and female allotype (K). (A) Distal part of left palp, prolateral view. (B) Same, ventral view. (C) Distal part of right palp, proventral and slightly distal view. (D) Same, prolateral view. (E) Patella to metatarsus of right leg I, prolateral view. (F) Patella to tibia of right leg I, ventral view. (G) Patella to metatarsus of right leg II, prolateral view. (H) Same of left leg II, prolateral view. (I) Patella to metatarsus of left leg II, ventral view. (J) Same of right leg II, ventral view. (K) Vulva, dorsal view. Arrows indicate keel-shaped retroventral process on metatarsus II. Scale lines 0.5 mm (A-J), 0.1 mm (K).

known only from the type locality, below the summit of Gunung Jasar in the Cameron Highlands. Surprisingly it occurs only a few kilometres away from localities where *M. ulu* sp. nov. was collected.

Malayathele maculosa Schwendinger, sp. nov.

Figs 12A-D, 13-14

Holotype: MHNG (sample AS-04/12); male; MALAYSIA, Pahang (see comment in paragraph "Distribution"), Fraser's Hill, 1 km south of town, 3°41'N, 101°45'E, 1250 m; 27.VIII.2004; leg. A. Schulz.

Paratypes: MHNG (sample WM93-5); 1 male; Selangor, 1 km below Fraser's Hill, 1280 m; 15.III.1993; leg. I. Löbl & F. Calame. – MHNG (sample AS-04/10); 2 females; Pahang, Fraser's Hill, south side, 3°42'N, 101°45'E, 1300 m; 26.VIII.2004; leg. A. Schulz. – MHNG (sample AS-04/14); 1 male; Pahang, Fraser's Hill, 2 km south of town, 3°41'N, 101°45'E, 1200 m; 28.VIII.2004; leg. A. Schulz. – MHNG (sample AS-04/16); 1 female; Pahang, Fraser's Hill, 2 km south of town, 3°43'N, 101°44'E, 1300 m; 29.VIII.2004; leg. A. Schulz. – MHNG (sample MAL-04/02); 3 females; Pahang, Genting Highlands, Gunung Ulu Kali, below hotel complex, 3°25'42"N, 101°47'41"E, 1650 m, montane rain forest; 18./19.V.2004; leg. P.J. Schwendinger.

Other material: MHNG (sample AS-04/10); 1 juvenile; MALAYSIA, Pahang, Fraser's Hill, south side, 3°42'N, 101°45'E, 1300 m; 26.VIII.2004; leg. A. Schulz. – MHNG (sample AS-04/12); 2 juveniles; Pahang, Fraser's Hill, 1 km south of town, 1250 m; 27.VIII.2004; leg. A. Schulz. – MHNG (sample AS-04/14); 1 juvenile; Pahang, Fraser's Hill, 2 km south of town; 28.VIII.2004; leg. A. Schulz.

Etymology: The Latin adjective "maculosus, -a, -um" (= spotted, mottled) refers to the distinct dark colour pattern on the opisthosoma of females (Fig. 12A-D).

Diagnosis: Males quite similar to those of *M. ulu* sp. nov., distinguished by longer embolus (Fig. 13A-G cf. Fig. 8A-E) and by the presence of two ventral processes on metatarsus II (Fig. 13J-M; proventral one absent in *M. ulu* sp. nov., Fig. 8I-J); distinguished from males of *M. cameronensis* sp. nov. by a curved embolus (Fig. 13A-G; instead of corkscrew-shaped, Fig. 11A-D), by a small conical retroventral process on metatarsus II (Fig. 13J-M; instead of keel-shaped, Fig. 11G-J) and by 5-7 ventral spines on tibia I (Fig. 13H-I; instead of only two, Fig. 11E-F); distinguished from males of *M. kanching* sp. nov. by an only slightly curved embolus (Fig. 13A-G; instead of strongly curved, Fig. 15A-C). Females distinguished from those of all other congeners by a distinct dark colour pattern dorsally and posteroventrally on opisthosoma (Fig. 12A-D; in some *M. kanching* sp. nov. females a faint dorsal pattern confined to dorsal surface); vulva different from that of *M. cameronensis* sp. nov. and *M. kanching* sp. nov. by possessing well developed lateral receptacles with constricted stalks (Fig. 14 cf. Figs 11K, 16), and from that of *M. ulu* sp. nov. by median receptacular stalks shorter and originating more anteriorly (Fig. 14 cf. Fig. 9).

Description: MALE (holotype). Colour in alcohol mostly light brown; palpal organ and cheliceral claws darker; eye mound black; no dark pattern on opisthosoma.

Body 2.73 long. Carapace 1.18 long, 0.90 wide, oval, thoracic and cephalic part at same level; few hairs on carapace (many abraded during sieving), a few stronger hairs in front of eye mound and in two paramedian bands behind it; two long bristles in front of pitlike fovea. Eyes on low mound; eye group 0.14 long, anterior eye row very slightly procurved, 0.20 wide, posterior eye row moderately recurved, 0.23 wide. Eye diameters and interdistances: AME 0.03, ALE 0.09, PME 0.06, PLE 0.07; AME-AME 0.02, PME-PME 0.04. MOQ 0.10 long, 0.09 wide anteriorly, 0.14 posteriorly.

Chelicerae weak, grooves with over 10 teeth on promargin (not all visible). Palpal coxae 0.35 long, 0.23 wide. Labium 0.05 long, 0.19 wide. Sternum 0.69 long, 0.60 wide.

Palps (Fig. 13A-C). Total length 1.59 (0.60 + 0.38 + 0.43 + 0.18). Several long strong bristles dorsally and ventrally on all articles, especially on femur and tibia; tarsus with 2 dorsodistal spines, plus one strong bristle prolaterally-distally and one retrolaterally-distally. Palpal organ with comparatively long, moderately curved embolus.

Legs 3214. Leg I 3.00 long (0.89 + 0.51 + 0.61 + 0.55 + 0.44); leg II 2.78 long (0.83 + 0.50 + 0.53 + 0.51 + 0.41); leg III 2.73 long (0.75 + 0.44 + 0.50 + 0.60 + 0.44); leg IV 3.64 long (0.95 + 0.55 + 0.73 + 0.88 + 0.53). Tarsi not pseudosegmented and without spines; with a few scopuliform hairs in distal portion of anterior legs. Metatarsal preening combs on legs II-IV. Leg I: Tibia carrying 5/6 ventral spines plus one strong ventral bristles subbasally (Fig. 13H-I). Femur with quite short band of hooked spinules retrodorsally. Leg II: Metatarsus with two small conical ventral processes, the proventral one situated at mid-length, the retroventral more proximally (Fig. 13J-K). Tibia with a single megaspine on a low ventral spur and with a long strong ventral bristle more proximally; a series of fine transversal wrinkles subdistally on ventral side (Fig. 13J-L). Band of hooked spinules proventrally on femur II longer than corresponding band on femur I, remote from distal margin of article.

Spines, trichobothria and claws of legs. All femora with numerous long strong bristles dorsally; I: tibia v5/6. II: tibia v1 (megaspine; plus v1 and p2 strong bristles);

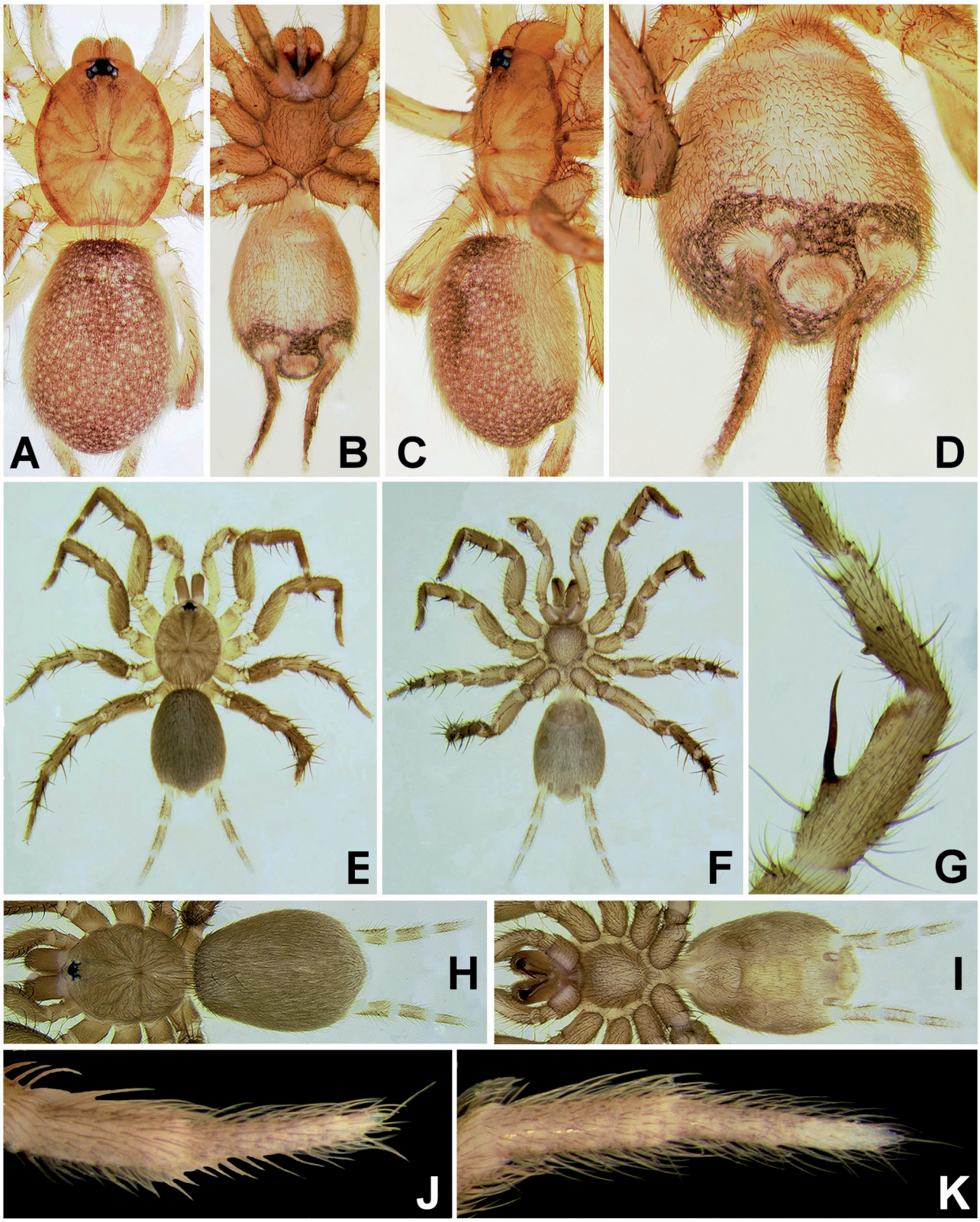

Fig. 12. *Malayathele maculosa* sp. nov., female paratype from Genting Highlands (A-D), *M. kanching* sp. nov., male holotype (E-G), female allotype (H-I) and male paratype (J-K). (A, E, H) Habitus, dorsal view. (B, F, I) Habitus, ventral view. (C) Habitus, dorsolateral view. (D) Opisthosoma, posteroventral view. (G) Tibia and metatarsus of right leg II, prolateral view. (J) Distal part of proximal article and entire median and distal articles of PLS, lateral view. (K) Same, ventral view. Not to scale.

metatarsus v2. III: patella p2, r1; tibia d1, p2, r1, v3 (plus v1 strong bristle); metatarsus d4, p2, v3. IV: patella p1, r1; tibia d1, p2, r2, v5 (plus v1 strong bristle); metatarsus d4, p2, r1, v4. Trichobothria not counted (difficult to see). Paired tarsal claws with 8 teeth on anterior legs, 6-7 on posterior legs; unpaired tarsal claws with 1-3 teeth.
Opisthosoma 1.28 long, 0.81 wide; most hairs on dorsal side abraded, some long dark bristles remaining on anterior margin. PMS 0.20 long, 0.06 wide in the middle, separated from each other by 0.18. PLS 1.11 long (proximal article 0.39 long and 0.14 wide, median article 0.33 long and 0.11 wide, distal article 0.39 long and 0.09 wide in the middle), separated from each other by 0.31.

FEMALE (allotype). Colour in alcohol mostly light brown, with a long, anteriorly widening pair of dark

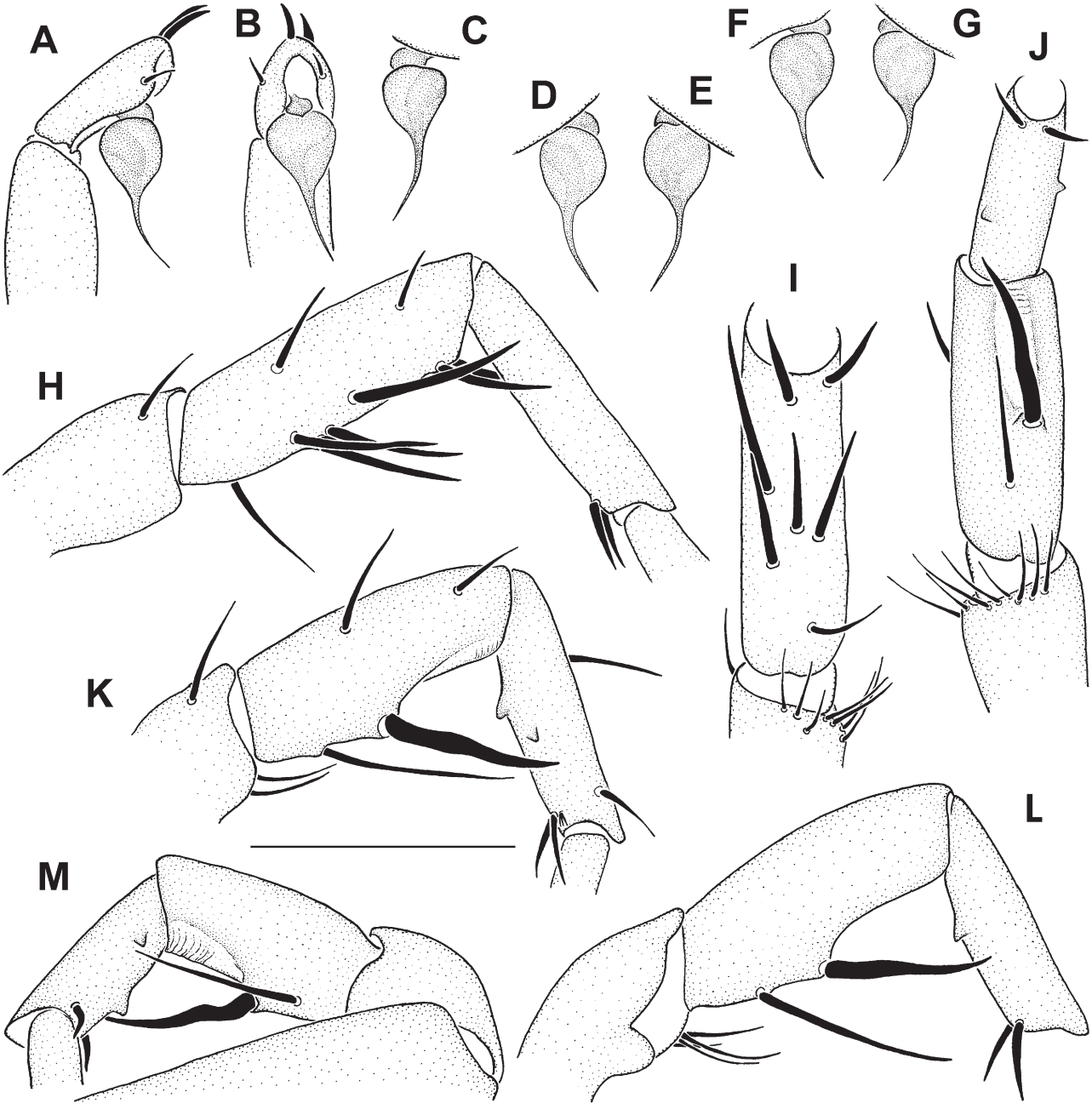

Fig. 13. *Malayathele maculosa* sp. nov., male holotype (A-C, H-L) and two male paratypes (D-E; F-G, M). (A) Distal part of left palp, prolateral view. (B) Same, ventral view. (C, E, G) Palpal organ of right palp, prolateral view. (D, F) Palpal organ of left palp, prolateral view. (H) Patella to metatarsus of left leg I, prolateral view. (I) Patella to tibia of left leg I, ventral view. (J) Patella to metatarsus of right leg II, ventral view. (K) Same of left leg II, prolateral view. (L) Same of right leg II, retrolateral view. (M) Same of left leg II, retrodorsal view. Scale line 0.5 mm.

bands between fovea and eye mound, shorter such paired bands on coxal elevations, and an unpaired band running into posterior margin of carapace (Fig. 12A showing female paratype). Opisthosoma with a dark speckled pattern on entire dorsal side and on posterior quarter of ventral side, leaving light rings around anal tubercle and bases of all spinnerets; lateral sides and anterior three quarters of ventral side cream-coloured (Fig. 12A-D showing female paratype).

Body 4.25 long. Carapace 1.66 long, 1.38 wide; thoracic part level with cephalic part; only few hairs (some abraded?) spread over carapace, a few stronger hairs in front of eye mound and in two paramedian bands behind it; two long bristles anterior of pitlike fovea (Fig. 12A, C showing female paratype). Eye group 0.17 long, anterior eye row very slightly procurved, 0.29 wide, posterior eye row moderately recurved, 0.30 wide. Eye diameters and interdistances: AME 0.05, ALE 0.11, PME 0.07, PLE 0.09; AME-AME 0.04, PME-PME 0.08. MOQ 0.12 long, 0.10 wide anteriorly, 0.19 posteriorly.

Chelicerae stronger than in males, grooves with 14/15 teeth on promargin. Palpal coxae 0.48 long, 0.31 wide. Labium 0.10 long, 0.35 wide. Sternum 0.95 long, 0.88 wide.

Palps. Total length 2.67 (0.84 + 0.55 + 0.63 + 0.65). Several long strong bristles on all articles; 5 weak ventral spines on tibia and 7 weak ventral spines on tarsus. Claws with 11 denticles.

Legs 3214. Leg I 4.17 long (1.20 + 0.74 + 0.89 + 0.79 + 0.55); leg II 3.83 (1.13 + 0.70 + 0.74 + 0.73 + 0.53); leg III 3.73 long (1.04 + 0.61 + 0.71 + 0.86 + 0.51); leg IV 4.97 long (1.38 + 0.78 + 1.00 + 1.15 + 0.66). Tarsi not pseudosegmented and without spines; without scopuliform hairs. Metatarsal preening combs on legs II-IV.

Spines, trichobothria and claws of legs. All femora with numerous long strong bristles dorsally; I: metatarsus v2. II: metatarsus v2. III: patella d1; tibia d2, p2, r1/2, v2/3; metatarsus d4, p2, v3/4. IV: patella d1; tibia d2, p2, r2, v4; metatarsus d4, p2, r1, v4. Trichobothria not counted (difficult to see). Paired tarsal claws with 10-12 teeth on anterior legs and 7-8 on posterior legs; unpaired tarsal claws with 1-3 teeth.

Opisthosoma 1.88 long, 1.28 wide. PMS 0.31 long, 0.10 wide in the middle, separated from each other by 0.40. PLS 1.67 long (proximal article 0.54 long and 0.20 wide, median article 0.50 long and 0.18 wide, distal article 0.63 long and 0.13 wide in the middle), separated from each other by 0.55.

Vulva with anteriorly narrowing spermathecal trunks; lateral receptacles well developed, stalks wide but clearly constricted, heads globular; median receptacles with medium-long, moderately curved stalks with sclerotised walls, originating quite high up on ventral side of spermathecal trunk, heads globular (Fig. 14A).

Variation: Carapace lengths in males (n = 3) range 1.11-1.26, carapace widths 0.84-0.98. The largest female (from the Genting Highlands) has a 1.73 long and 1.45 wide carapace. No noteworthy variation can be seen in the shape of the palpal organs of three males (Fig. 13A-G). There are 5-7 ventral spines on tibia I of males. Distal wrinkles on the ventral side of tibia II are indistinct in all three males examined; few of them are visible in the holotype (Fig. 13J-K), distinctly more in the male from sample AS-04/14 (Fig. 13M). Variation in the shape of the vulvae of three females is shown in

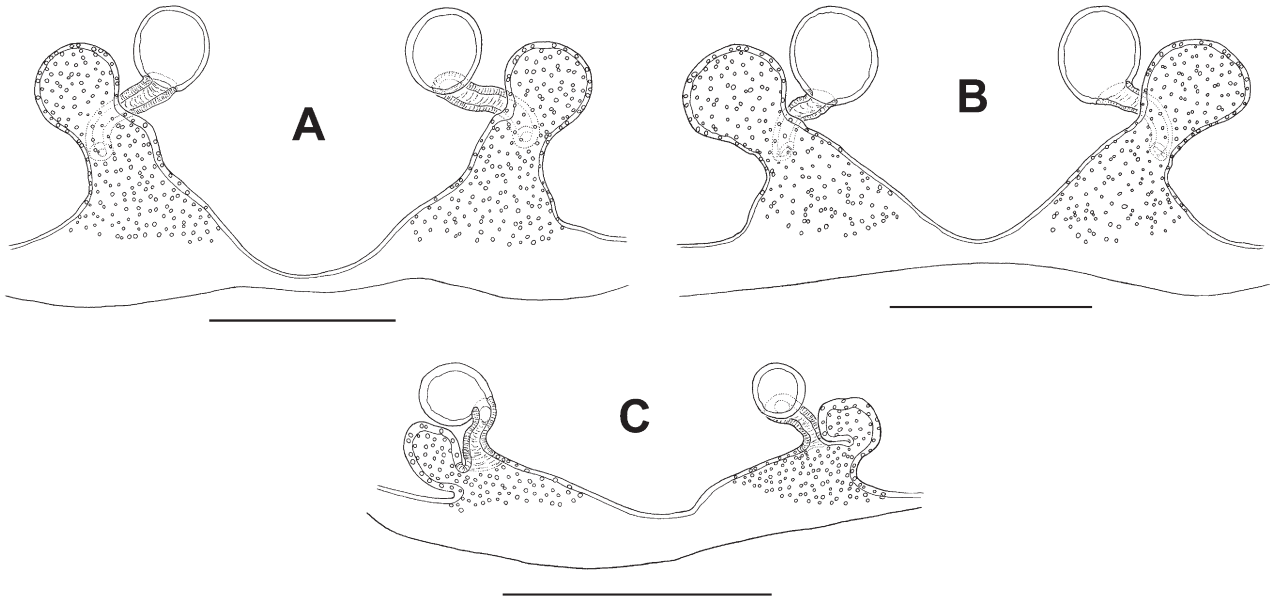

Fig. 14. *Malayathele maculosa* sp. nov., vulvae of three females (all drawn from dissected specimens), dorsal view. (A) Allotype. (B) Paratype from Genting Highlands. (C) Juvenile female paratype from Fraser's Hill. Scale lines 0.1 mm.

Fig. 14. The specimen from sample AS-04/10 is a small female and its vulva appears to be not fully developed (Fig. 14C).

Biology: The specimens examined were sifted from the leaf litter of montane rain forests.

Distribution: *Malayathele maculosa* sp. nov. is known from a few localities between 1200 m and 1300 m on Fraser's Hill, at the border between Pahang and Selangor, and from a locality at 1650 m in the Genting Highlands (Fig. 2, localities 15-16). Although some are given as situated in Pahang State, all localities (including the type locality) on Fraser's Hill probably lie on the Selangor side of the border.

Malayathele kanching Schwendinger, sp. nov.

Figs 1L, 12E-K, 15-16

Holotype: MHNG (sample SIM-01/14); male (matured beginning of XI.2001); MALAYSIA, Selangor, Templer Park (= Hutan Lipur Kanching), above Kanching Waterfall, 3°18'25"N, 101°37'10"E, rain forest, 230-370 m; 13.VII.2001; leg. P.J. Schwendinger.

Paratypes: MHNG; 3 males (matured beginning of VIII.2001, 2.X.2001, beginning of XI.2001) and 7 females (one of them the allotype); collected together with the holotype. – NHMS (sample SIM-01/14); 1 male (matured end of IX.2001) and 1 female; collected together with the holotype. – MHNG (sample F91-1223); 2 females; Selangor, Ulu Gombak, University of Malaya Field Centre, secondary forest along river, 200 m; 26.IX.1991; leg. D. Agosti.

Other material: MHNG and NHMS; 3 juveniles; collected together with the holotype.

Etymology: The species epithet, a name in apposition, refers to the type locality, the Hutan Lipur Kanching. It probably is the old spelling of the Malay word "kancing" = button, usually referring to a hook-like button.

Diagnosis: Males distinguished from those of all other congeners by a strongly curved embolus (Fig. 15A-C), by a single spine retroventrally-distally on patella I (Fig. 15E; in other species a series of bristles at that place), and by a pigmented, triangular area with very indistinct wrinkles retroventrally-distally on tarsus II (Fig. 15F; no pigmented area and more distinct wrinkles in males of other congeneric species); additionally distinct from males of *M. ulu* sp. nov. by the presence of two ventral processes on metatarsus II instead of only a retroventral one (Fig. 15F-H cf. Fig. 8I-J), and from the male holotype of *M. cameronensis* sp. nov. by having numerous ventral spines on metatarsus II instead of only two (Fig. 15D-E cf. Fig. 11E-F). Females distinguished from those of all other congeners by a vulva with wide, ventrad-bent lateral receptacles without constricted stalks (Fig. 16). Some females with a faint dark mottled colour pattern confined to dorsal surface of opisthosoma (some females without such a pattern, Fig. 12H; in females of *M. maculosa* sp. nov. pattern always present and extending to posteroventral area, Fig. 12A-D).

Description: MALE (holotype). Colour in alcohol (Fig. 12E-F, slightly darker in life) mostly light brown; palps, sternum and ventral side of spinnerets slightly lighter; proximal article of chelicerae slightly darker; all membranes and prolateral zone of palpal coxae cream-coloured; cheliceral claw and palpal organ dark brown; eye mound black; carapace with two distinct dark paramedian bands between eye mound and fovea, and with indistinct dark bands on coxal elevations.

Body 3.74 long. Carapace 1.34 long, 1.03 wide, oval, almost flat, thoracic part at same level as cephalic part, quite densely covered with fine, grey, wavy hairs; few stronger bristles in front of eye mound; two long straight bristles in front of pitlike fovea. Eyes on low mound; eye group 0.15 long, anterior eye row slightly procurved, 0.24 wide, posterior eye row moderately recurved, 0.25 wide. Eye diameters and interdistances: AME 0.04, ALE 0.10, PME 0.06, PLE 0.09; AME-AME 0.02, PME-PME 0.06. MOQ 0.12 long, 0.10 wide anteriorly, 0.16 posteriorly.

Chelicerae weak, grooves with 12/13 teeth on promargin and with a short row of tiny medioproximal denticles. Palpal coxae 0.34 long, 0.25 wide. Labium 0.12 long, 0.27 wide. Sternum 0.72 long, 0.71 wide.

Palps (Fig. 15A-B). Total length 1.87 (0.64 + 0.42 + 0.46 + 0.35). Several long strong bristles dorsally and ventrally on all articles, especially on femur and tibia; tarsus with 2 spines distally and with a strong bristle prolaterally-distally as well as retrolaterally-distally. Palpal organ with hook-shaped embolus, its apex strongly curved ventrad.

Legs 2314. Leg I 3.49 long (0.99 + 0.62 + 0.68 + 0.67 + 0.53); leg II 3.19 long (0.89 + 0.55 + 0.61 + 0.62 + 0.52); leg III 3.36 long (0.87 + 0.48 + 0.72 + 0.74 + 0.55); leg IV 4.16 long (1.08 + 0.60 + 0.82 + 0.99 + 0.67). Tarsi not pseudosegmented and without spines; with a few scopuliform hairs in distal portion of anterior legs. Metatarsal preening combs on legs II-IV (missing on right leg II). Leg I: Tibia carrying 6 ventral spines (Fig. 15D-E). Patella with a single, slightly curved retroventral-distal spine (Fig. 15E). Distal part of femur with short band of hooked spinules retrodorsally. Leg II: Metatarsus with two small conical processes, the proventral one slightly smaller and situated more distal than the retroventral one (Fig. 15F-G). Tibia ventrally with a low median spur carrying a single megaspine and with a long strong bristle situated more proximally; a pigmented triangular area with indistinct wrinkles retroventrally-distally (Fig. 15F). Band of hooked spinules proventrally on femur II slightly longer than corresponding retrodorsal band on femur I, remote from

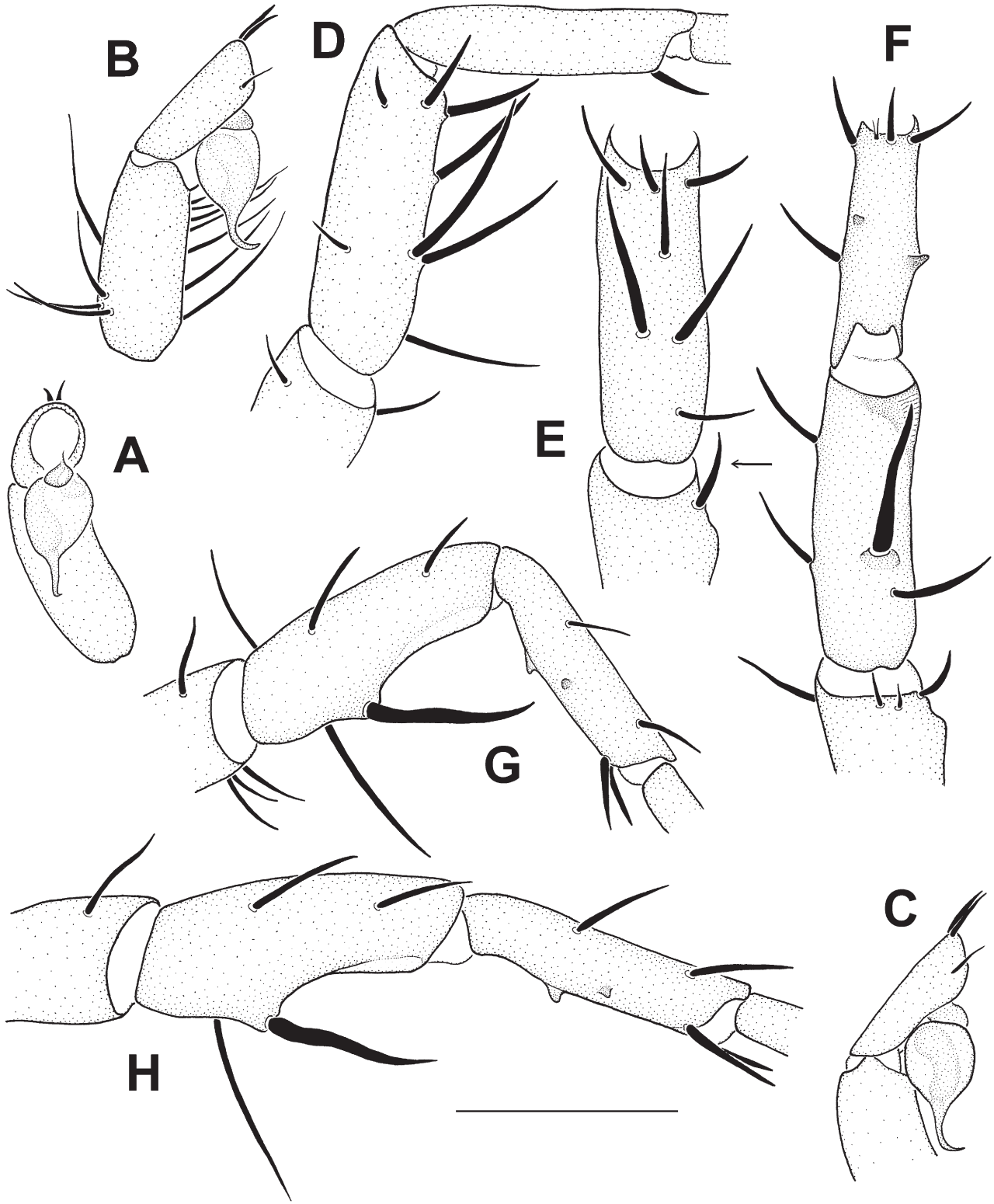

Fig. 15. *Malayathele kanching* sp. nov.; male holotype (A-B, D-G) and male paratype (C, H). (A) Distal part of right palp, ventral view. (B-C) Same of left palp, prolateral view. (D) Patella to metatarsus of left leg I, prolateral view. (E) Patella and tibia of left leg I, ventral view. (F) Patella to metatarsus of left leg II, ventral view. (G-H) Same, prolateral view. Arrow indicates single spine retroventrally-distally on patella I. Scale line 0.5 mm.

distal margin of article, spinules more widely spaced.
Spines, trichobothria and claws of legs. All femora with numerous long strong bristles dorsally; I: patella v1; tibia p2, v6; metatarsus v1. II: patella v1; tibia p2, v1 (megaspine); metatarsus p2, v2. III: patella d4; tibia d3, p2, r2, v5; metatarsus d5, v5. IV: patella d3; tibia d3, p2, r2, v6; metatarsus d6, v5. Trichobothria not counted (difficult to see). Paired tarsal claws with 8-9 teeth on anterior legs, 5-6 on posterior legs; unpaired claws with 2-3 teeth.
Opisthosoma 1.76 long, 1.19 wide; densely covered with fine adpressed grey hairs interspersed with longer dark bristles (longest on anterior margin; Fig. 12E-F). PMS 0.22 long, 0.07 wide in the middle, separated from each other by 0.37. PLS 1.63 long (proximal article 0.56 long and 0.15 wide, median article 0.55 long and 0.12 wide, distal article 0.52 long and 0.09 wide in the middle), separated from each other by 0.60; distal article not pseudosegmented, weakly pigmented in distal half (Fig. 12J-K showing male paratype).

FEMALE (allotype). Colour in alcohol as in male, but all dark bands on carapace indistinct, no dark colour pattern on dorsal side of opisthosoma discernible (Fig. 12H-I).
Body 5.20 long. Carapace 1.85 long, 1.53 wide. Eye group 0.19 long, anterior eye row slightly procurved, 0.29 wide, posterior eye row slightly recurved, 0.32 wide. Eye diameters and interdistances: AME 0.05, ALE 0.12, PME 0.08, PLE 0.09; AME-AME 0.04, PME-PME 0.06. MOQ 0.14 long, 0.12 wide anteriorly, 0.20 posteriorly.
Chelicerae stronger than in males, grooves with 15 teeth on promargin and with a short row of about 10 tiny medioproximal denticles. Palpal coxae 0.50 long, 0.36 wide; serrula composed of a band of tiny denticles (Fig. 1L showing female paratype). Labium 0.13 long, 0.43 wide. Sternum 0.98 long, 0.96 wide.
Palps. Total length 2.74 (0.90 + 0.56 + 0.63 + 0.65). Several long strong bristles dorsally and ventrally on all articles, especially on femur and tibia; tarsus with 4 distinct ventral spines. Claw with 10 teeth.
Legs 3214. Leg I 4.20 long (1.23 + 0.76 + 0.85 + 0.78 + 0.58); leg II 3.96 long (1.23 + 0.71 + 0.71 + 0.71 + 0.60); leg III 3.91 long (1.05 + 0.65 + 0.73 + 0.85 + 0.63); leg IV 4.97 long (1.28 + 0.90 + 1.00 + 1.10 + 0.69). Tarsi not pseudosegmented and without spines; without scopuliform hairs. Metatarsal preening combs on legs II-IV.
Spines, trichobothria and claws of legs. All femora with numerous long strong bristles dorsally; I: patella p2; tibia p2 (weak), v5; metatarsus v4/5. II: patella p2; tibia p2 (weak), v4; metatarsus p2, v5. III: patella d3; tibia d4, p2, v5; metatarsus d5, v5/6. IV: patella d2; tibia d6, p2, v5; metatarsus d6, v5/6. Trichobothria not counted (difficult to see). Paired tarsal claws with 9-11 teeth on anterior legs, 7-8 on posterior legs; unpaired tarsal claws with 2-3 teeth.
Opisthosoma 2.65 long, 1.88 wide. PMS 0.30 long, 0.10

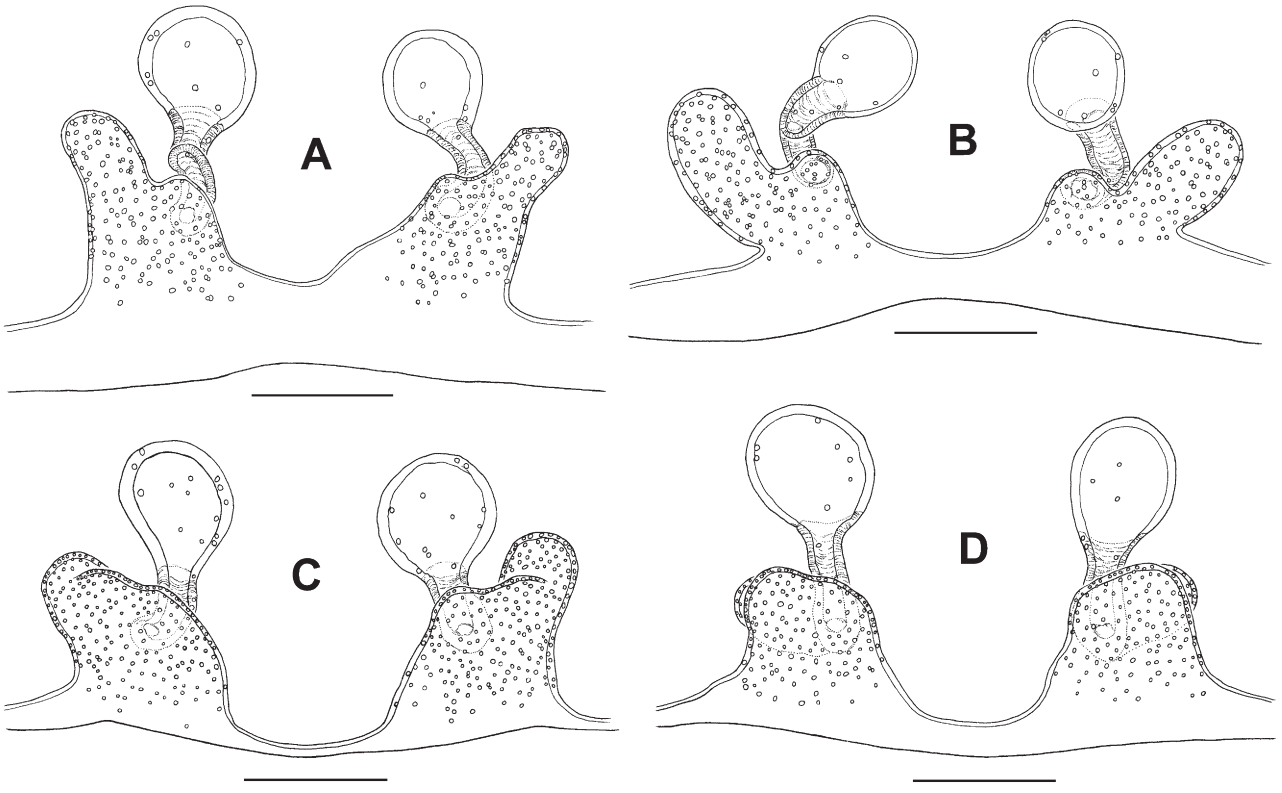

Fig. 16. *Malayathele kanching* sp. nov.; vulvae of four female paratypes, dorsal (A-B) to increasingly more postero-dorsal view (C-D). (A, C-D) Specimens from the Templer Park. (B) Specimen from Ulu Gombak. Scale lines 0.05 mm.

wide in the middle, separated from each other by 0.58. PLS 1.91 long (proximal article 0.68 long and 0.23 wide, median article 0.59 long and 0.19 wide, distal article 0.64 long and 0.14 wide in the middle), separated from each other by 0.88.
Spermathecae (of female paratypes, allotype not dissected; Fig. 16) wide, somewhat trapezoidal in shape; lateral receptacles without constricted stalks, therefore transition to spermathecae not well marked, apex bent ventrad; median receptacle with medium-long and medium-thin curved stalks with sclerotised walls.

Variation: Carapace lengths in males (n = 5) range 1.28-1.44, carapace widths 1.03-1.19. The largest female (from Templer Park) has a 1.87 long and 1.50 wide carapace. For variation in the shape of the vulvae see Fig. 16. The lateral receptacles are bent ventrad and therefore the vulvae look quite different when seen from different angles. The stalks of the median receptacles are more or less strongly curved or twisted. Variation in the shape of palpal organs and of tibiae and metatarsi II is shown in Fig. 15. All males possess a single retroventral-distal spine on patella I. There are 6-7 ventral spines on tibia I of males (seven spines only in two males and only on one side of the body). In all males, eleven females (including the allotype, Fig. 12H) and two juveniles from the type locality no dark dorsal pattern on the opisthosoma is discernible. In three females and one juvenile (all with most opisthosomal hairs abraded) a very indistinct one can be seen. In two females from Ulu Gombak (also with most hairs abraded) a dark mottled dorsal pattern is clearly visible, but it is less pronounced than in females of *M. maculosa* sp. nov. and it does not extend to the posteroventral area. Thus the opisthosomal colour pattern appears to be usually present in these two species, but it is hidden under the hair cover.

Relationships: Geographical proximity (in horizontal, not vertical respect), similarities in male and female copulatory organs and the common presence of a more or less pronounced dark pattern on the opisthosoma of females indicate a close relationship between *M. kanching* sp. nov. and *M. maculosa* sp. nov.

Distribution: This species is known from two lowland localities (Templer Park and Ulu Gombak) near Kuala Lumpur (Fig. 2, localities 17-18).

Biology: The specimens examined were collected by sieving leaf litter in rain forests. The Templer Park site is near a small stream and a waterfall. Some spiders from there were kept in captivity in Geneva where they mated and reproduced. Five males (collected in mid-July) matured between the beginning of August and the beginning of November of the same year, which probably corresponds to the mating period in nature.

Other related species

Numerous additional female and juvenile specimens with a euagrid/diplurid habitus, collected in Southeast Asia by sieving leaf litter and by soil extractions by means of Berlese funnels, are lodged in the MHNG. Mature male specimens are necessary for a proper generic placement (and in the case of the first species for a proper identification). These unidentified specimens do not seem to belong to *Phyxioschema* or *Masteria,* the latter of which has not yet been found on mainland SE-Asian or the Sunda Islands. They can be assigned to at least four species, three of them presumably unnamed.

***Malayathele* sp.**

Material: MHNG; 2 juveniles; MALAYSIA, Perak, NE of Chenderiang, 300 m, rain forest; 22.-31.I.1994; leg. P.J. Schwendinger.

Remark: The locality (Fig. 2, locality 13) lies about 20 km south of Ulu Groh, the type locality of *M. ulu* sp. nov., and these specimens are presumably conspecific.

***Malayathele* sp.**

Material: MHNG; 1 female; MALAYSIA, Kelantan, Jeram Pasu Waterfall, 100 m, rain forest; 10./11.I.1999; leg. P.J. Schwendinger.

Remarks: The locality (Fig. 2, locality 19) of this specimen is quite distant from the localities of the species described above. The spider is a fully adult female which possesses metatarsal preening combs and a relatively thin hair cover on the carapace, and therefore most likely belongs to the genus *Malayathele* gen. nov. Its vulva (not illustrated) resembles that of the *M. cameronensis* sp. nov. female in having reduced lateral receptacles; it is distinguished by narrow spermathecal trunks and by the lateral receptacles essentially lost.

***?Malayathele* sp.**

Material: MHNG; 1 female (sample Sum-06/31); INDONESIA, North Sumatra Province, Lumban Rang National Park, near road from Prapat to Porsea, 2°36’14”N, 99°02’42”E, 1350 m, rain forest; 1.VII.2006; leg. P.J. Schwendinger.

Remarks: This specimen resembles *Malayathele* specimens from Peninsular Malaysia in having metatarsal preening combs and a quite thin hair cover on the carapace. Due to the lack of cuspules and to the shape of the palpal coxae (with bulging ventral surface, pale and glabrous prolateral zone and without retrolateral-proximal heel) and of the labium (with pale

and glabrous anterior zone) it clearly is not an early instar of a *Macrothele* (Macrothelidae), a spider genus that also occurs on Sumatra and has a similar habitus. The specimen appears to be a female, but its genital region was not dissected. The locality (not given in Fig. 2) is far away from the localities of the species treated above, separated by the Straits of Malacca, and therefore it is possible that this specimen belongs to an undescribed genus. The MHNG houses extensive spider material collected by extraction of forest litter on Sumatra, but this is the only euagrid/diplurid specimen among them.

Euagridae/Dipluridae gen. sp.

Material: MHNG; 1 juvenile female (sample Sar-87/90); SINGAPORE, jungle part of Botanical Garden, 25 m; 16.XII.1987; leg. B. Hauser. – MHNG; 18 juveniles (sample SL/SI-93/2); SINGAPORE, NW corner of Sentosa Island, rain forest remnant, 30 m; 21.VII.1993; leg. B. Hauser. – MHNG; 6 juveniles (sample SBH-96/3); SINGAPORE, SE part of Bukit Timah Nature Reserve, Rifle Range Road, rain forest; 20.XI.1996; leg. B. Hauser. – MHNG; 10 juveniles (sample SBH-96/4); SINGAPORE, NNW of MacRitchie Reservoir, "Campnospermum Track", 40 m, rain forest remnant; 21.XI.1996; leg. B. Hauser. – MHNG; 1 juvenile (sample SBH-96/5); SINGAPORE, NNW of MacRitchie Reservoir, 60 m, rain forest; 21.XI.1996; leg. B. Hauser. – MHNG; 1 juvenile (sample SIM-01/06); INDONESIA, Bintan Island, about 5 km NW of Kijang, Mt Langkuas, 0°52'34"S, 104°34'45"E, 125-220 m, disturbed rain forest; 22./23. VI.2001; leg. P.J. Schwendinger. – MHNG; 3 juveniles (sample SIM-01/04); INDONESIA, Singkep Island, Batu Ampar Waterfall, about 10 km NW of Dabo, 0°29'31"S, 104°28'31"E, 80 m, rain forest; 17./18. VI.2001; leg. P.J. Schwendinger.

Remarks: All available specimens are distinctly smaller than the adult *Malayathele* gen. nov. specimens examined. The largest specimen (from Singapore; Fig. 2, locality 20) has a vulva with fully developed lateral receptacles, which resembles that of *M. kanching* sp. nov. females. However, the absence of metatarsal preening combs and the presence of only two eyes (seemingly the AME) indicate that this represents an undescribed genus. The spider fauna of Singapore Island is quite well documented, but to our knowledge no such spiders have ever been reported from there. It is possible that they were actually collected, but ignored or discarded as juveniles. Obviously this species is obscure, but nevertheless widely distributed on Singapore and the Indonesian islands south of it. Singkep Island is over 200 km away from Singapore.

DISCUSSION

Taxonomy: Within the species treated in this paper, two clearly defined groups can be recognized. The absence of metatarsal preening combs, the presence of two or more megaspines and of a transversal subdistal ridge on the ventral side on tibia II clearly distinguishes *L. bencha* and *L. chang* sp. nov. in southern Thailand from the four species in Malaysia. The latter lack metatarsal preening combs, and the ventral side of tibia II has only a single megaspine and no subdistal ridge. Females of the Thai species (*Leptothele* spp.) have non-sclerotised median receptacular stalks, the Malaysian species have those stalks sclerotized. These very obvious morphological differences justify the separation of these two species groups into different genera, and thus *Malayathele* gen. nov. is established to harbour the four new Malaysian species.

Within those, *M. kanching* sp. nov. and *M. cameronensis* sp. nov. stand out by displaying modifications of the embolus (hook-shaped and corkscrew-shaped, respectively) not seen in other Asian Euagridae. In *Leptothele* spp. and *Phyxioschema* spp. the embolus is quite straight and/or only slightly curved at the apex (Schwendinger, 2009; Schwendinger & Zonstein, 2011; Schwendinger & Zamani, 2018). Moreover, these two exceptional species possess modifications of the lateral receptacles (bent ventrad and stalk not constricted in *M. kanching* sp. nov.; reduced to a boss in *M. cameronensis* sp. nov.) that are also unique within the Asian Euagridae. The unnamed *Malayathele* sp. at the Jeram Pasu Waterfall (Fig. 2, locality 19), so far only known from a single female, is equally remarkable: it has completely reduced lateral receptacles (not illustrated). Without a phylogeny and more species (undoubtedly additional ones will be discovered in the future) it is premature to draw conclusions on relationships, but we believe that dwarfism and a trend for modifications of the embolus and of the lateral receptacles is a strong indication that *Malayathele* spp. are more derived than the species in *Leptothele* and *Phyxioschema*.

Biogeography: The newly available material shows that Euagridae (and possibly Dipluridae) are fairly species-rich and widely distributed on the Thai-Malay Peninsula, Sumatra, Singapore and nearby islands. *Leptothele bencha* is widespread and actually fairly common along the Andaman coast of southern Thailand (south of Phangnga), but due to its small size and obscure habitat (leaf litter) has so far been largely overlooked. This lack of previous records is particularly surprising for the generally well-investigated spider fauna of Singapore. Further collecting by means of sieving or Berlese-extraction of forest litter in that area will undoubtedly uncover a much greater diversity in species and genera, and probably also a much wider geographical range.

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