

# Integrative taxonomy of *Leptonetela* spiders (Araneae, Leptonetidae), with descriptions of 46 new species

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## ABSTRACT

Extreme environments, such as subterranean habitats, are suspected to be responsible for morphologically inseparable cryptic or sibling species and can bias biodiversity assessment. A DNA barcode is a short, standardized DNA sequence used for taxonomic purposes and has the potential to lessen the challenges presented by a biotic inventory. Here, we investigate the diversity of the genus *Leptonetela* Kratochvíl, 1978 that is endemic to karst systems in Eurasia using DNA barcoding. We analyzed six hundred and twenty four specimens using one mitochondrial gene fragment (COI). The results show that DNA barcoding is an efficient and rapid species identification method in this genus. It indicated the existence of 90 species, a result consistent with previous taxonomic hypotheses and supported the existence of extreme male pedipalpal tibial spine and median apophysis polymorphism in *Leptonetela* species, with direct implications for the taxonomy of the group and its diversity, using DNA barcoding gap and automatic barcode gap discovery (ABGD) analyses. Based on the molecular and morphological evidence, we delimit and diagnose 90 *Leptonetela* species, including the type species *Leptonetela kanellisi* (Deeleman-Reinhold, 1971); 46 of them are previously undescribed species. *Leptonetela tianxinensis* (Tong & Li, 2008) comb. nov. is transferred from the genus *Leptonetela* Simon, 1872; The genus *Guineta* Lin & Li, 2010 syn. nov. is junior synonym of *Leptonetela*, *Leptonetela gigachela* (Lin & Li, 2010) comb. nov. is transferred from genus *Guineta*. The genus *Sinoneta* Lin & Li, 2010 syn. nov. is junior synonym of *Leptonetela*, *Leptonetela notabilis* (Lin & Li, 2010) comb. nov., *Leptonetela sexdigiti* (Lin & Li, 2010) comb. nov. are transferred from genus *Sinoneta*; *Leptonetela sanchahe* nom. nov. is proposed as replace name for *Sinoneta palmata* (Chen et al., 2010) because *Leptonetela*

*palmata* is a preoccupied name.

**Keywords:** DNA barcoding; Phylogeny; Phenotype; Species delineation

## INTRODUCTION

Subterranean ecosystems, such as caves and cracks, are evident mainly in karst areas, which represent nearly 4% of the rocky outcrops of the world. These environments are marked by permanent darkness, a lack of diurnal and annual rhythms, and extremely scarce food sources (Culver & White, 2005; Howarth, 1983; Poulson & White, 1969). Many studies show that despite stressful and unfavorable conditions, the subsurface habitat harbors diverse animal communities (mainly invertebrates) (Amara-Zettler et al., 2002; Flot et al., 2010; López-García et al., 2001; Mathieu et al., 1997; Niemiller et al., 2012; Sket, 1999). Troglobionts are expected to adopt strategies that are characterized by significant geographic isolation and numerous local endemics (Convey, 1997; Waterman, 2001). Because the diversity of possible adaptive responses decline with stress intensity (Nevo, 2001), evolution in harsh environments is also expected to be influenced by convergence (Little & Vrijenhoek, 2003; Rothschild & Mancinelli, 2001; Waterman, 2001). Therefore, in subterranean and more generally in extreme environments, diversification and speciation processes should be largely influenced by island-like habitats, such as caves, allopatric speciation and vicariant events, and could be masked by morphological convergence. For these groups of organisms,

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morphology alone cannot determine species boundaries. So identifying morphologically inseparable cryptic or sibling species requires an integrative approach with a set of taxonomic tools, including DNA analysis.

DNA barcoding relies on the use of a standardized DNA region as a tag for accurate and rapid species identification (Hebert & Gregory, 2005) and has been advanced to help overcome the 'taxonomic impediment' (Herbert et al., 2003a; Tautz et al., 2003). It aids in the identification of species in applied settings, the association of morphologically distinct life-cycle forms within a species, the detection of host-specific lineages and the detection of morphologically cryptic species (Miller & Footitt, 2009). DNA barcoding has been used in a diverse range of vertebrate and invertebrate taxa (Clare et al., 2007; Ratnasingham & Hebert, 2007) and has enabled an increasing number of taxa to be identified. For example, a survey of crustacean stygofauna suggests that there could be substantial levels of subterranean biodiversity hidden in Australia's aquifer (Asmyhr & Cooper, 2012). Nevertheless, the exclusive use of single-locus molecular gene fragments is not without risks, for identical mitochondrial DNA sequences can be present in unrelated species due to introgression, or incomplete lineage sorting (Ballard & Whitlock, 2004). Additionally, the use of a divergence threshold for distinguishing intra- versus interspecific sequence variation (Hebert et al., 2003a) can seriously compromise species identification and suffers from severe statistical problems (Vences et al., 2005). Furthermore, species misidentification has been observed when a reference database is not comprehensive; such that it does not contain all the species of the group under study (Meyer & Paulay, 2005).

The South China karst, a UNESCO World Heritage Site since 2007, is noted for its karst features and landscapes as well as rich biodiversity. Numerous subterranean species have been reported in this region, especially invertebrate fauna (Zhang, 1986). The spider genus *Leptonetela* is discontinuously distributed in the South China karst and the Balkan Peninsula, a karstic region in Europe. The genus has 54 catalogued species (World Spider Catalog, 2017), and with one exception (*L. pungitia* Wang & Li, 2011), nearly all *Leptonetela* species are endemic to either a single cave or a cave system. The spiders are cave adapted and show morphological features, such as vestigial eyes and highly reduced skin pigmentation. Over the past 9 years, we have conducted extensive surveys of subterranean biodiversity in Eurasia. More than 1,500 caves were visited, and we ultimately sampled 122 *Leptonetela* populations (caves). Rapid and accurate identification within this genus is difficult due to congeneric species sharing similar morphological traits, a lack of obvious morphological differences between closely related species and some species only differ in some quantity difference, such as the location, length ratio or thickness of the male pedipalpal tibia spines and the number of teeth on the median apophysis.

In this study, we test the usefulness of DNA barcoding for species identification in the subterranean genus *Leptonetela* and investigate the diversity of the genus. The standard molecular barcode, cytochrome c oxidase subunit I (COI) was used. A species discovery method, automatic barcode gap discovery (ABGD) (Puillandre et al., 2012), and a species

validation method, DNA barcoding gap analysis, (Hebert et al., 2003b) were both used, depending on whether the samples were partitioned prior to analysis. The main goals of our study were: (i) to test whether the COI barcoding fragment can reliably resolve and identify subterranean *Leptonetela* species by comparing the COI barcode fragment results with those from morphological data; (ii) to test taxonomic value of morphological characters used in traditional methods of classification.

## MATERIALS AND METHODS

### Taxon sampling

We sampled 624 *Leptonetela* individuals from 122 populations (caves) (Table S1) in Eurasia (Insular and Peninsular Greece, and Southeast Asia; see inset in Fig. 1). Nine individuals from three other genera of the family Leptonetidae were chosen as the out-group. All specimens were collected alive, fixed in absolute ethanol, and the legs were removed for subsequent DNA extraction. The remaining specimens were preserved in 80% ethanol for identification and morphological examination. For small juveniles entire specimens were used for DNA extraction. Voucher specimens and all type specimens were deposited in the National Zoological Museum, Chinese Academy of Sciences (IZCAS), Beijing, China.

### Molecular protocols

Total genomic DNA was extracted using the Animal Genomic DNA Isolation Kit (Dingguo, Beijing, China), following the manufacturer's protocol. We amplified the cytochrome c oxidase subunit I (COI) barcode region using the primer pairs LCOI490/HCO2198 (Folmer et al., 1994). PCR reaction conditions were: initial denaturation at 94 °C for 1 min; 35 cycles of denaturation at 94 °C for 1 min, annealing at 45 °C for 45 s, and elongation at 70 °C for 60 s; and final extension at 72 °C for 5 min. The 25- $\mu$ L PCR reactions included 17.25  $\mu$ L of double-distilled H<sub>2</sub>O, 2.5  $\mu$ L of 10 $\times$  Taq buffer (mixed with MgCl<sub>2</sub>; TianGen Biotech, Beijing, China), 2.0  $\mu$ L of dNTP Mix (2.5 mM), 1  $\mu$ L of each forward and reverse 10- $\mu$ M primer, 1  $\mu$ L of DNA template, and 0.25  $\mu$ L Taq DNA polymerase (2.5 U  $\mu$ L<sup>-1</sup>; TianGen Biotech, Beijing, China). Double-stranded PCR products were visualized by agarose gel electrophoresis (1% agarose). PCR products were purified and sequenced by Sunny Biotechnology Co., Ltd (Shanghai, China) using the ABI 3730XL DNA analyser. Sequences were aligned using ClustalW in Mega 6.0 (Tamura et al., 2013), with visual inspection, translation, and manual adjustment to minimize alignment error. The most appropriate phylogenetic model for the sequence alignment was selected using jModelTest2 (Darriba et al., 2012) under the Akaike Information Criterion (Posada & Crandall, 1998).

### Phylogenetic analyses

Phylogenetic analyses were performed using maximum likelihood (ML) in RAXML v. 7.0.3 and the GTRCAT model (Stamatakis, 2006). One hundred replicate ML inferences were performed in the search for an optimal ML tree, each initiated with a random starting tree and employing the default rapid hill-climbing algorithm. Clade confidence was assessed with a rapid bootstrap of 1,000 replicates.

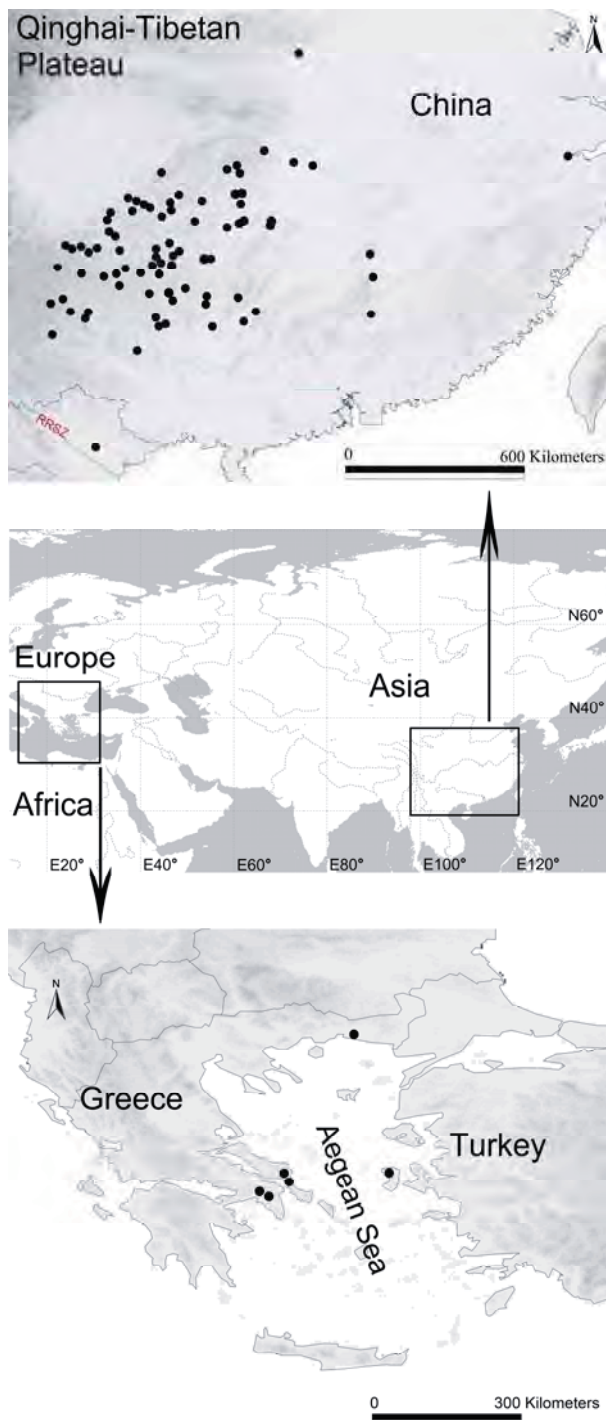


FIGURE 1 Area of endemic of *Leptonetela*

#### Species delineation

We analyzed the *COI* barcode dataset (see Appendix S1) using two species delineation methods. DNA barcoding gap analyses require an *a priori* species designation. Therefore, we divided

the 624 *Leptonetela* individuals of 122 populations (caves) into 90 putative species based on morphological characters and geographic information. In our DNA barcoding gap analysis, we examined the overlap between the mean intraspecific and interspecific Kimura 2-parameter (K2P) (Kimura, 1980) and uncorrected p-distance (Nei & Kumar, 2000) for each candidate species, as calculated by Mega v. 6.0 (Tamura et al., 2013).

The automatic barcode gap discovery procedure (ABGD) (Puillandre et al., 2012), which does not require assigning samples to putative species, calculates all pairwise distances in the dataset, evaluates intraspecific divergences, and then sorts the samples into candidate species using the calculated distances. We performed ABGD analyses online (<http://www.abgd.fr/public/abgd/>), using three different distance metrics: Jukes-Cantor (JC69) (Jukes & Cantor, 1969), Kimura 2-parameter (K2P) (Kimura, 1980), and simple distance (p-distance) (Nei & Kumar, 2000). We analyzed the data using two different values for the parameters Pmin (0.0001 and 0.001), Pmax (0.1 and 0.2), and relative gap width ( $X = 1$  or 1.5), with all other parameters at default values.

#### Taxonomy

The terminology and the measurements in this paper generally follow Wang & Li (2011) and Ledford et al. (2011). All measurements were taken in millimetre (mm). The left palpi of male spiders are illustrated, except where otherwise indicated. Abbreviations used in text include: PL – prolateral lobe; E – embolus; C – conductor; MA – median apophysis; At – atrium; SS – spermathecae stalk; SH – spermathecae.

#### Nomenclatural acts

This article conforms to the requirements of the amended International Code of Zoological Nomenclature. All nomenclatural acts contained within this published work have been registered in ZooBank. The ZooBank LSIDs (Life Science Identifiers) can be resolved and the associated information viewed by appending the LSID to the prefix “<http://zoobank.org/>”. The LSID for this publication is: urn:lsid:zoobank.org:pub:7ECB1BDC- 8893-4D0F-8BEA-17ECE327FC47

#### RESULTS

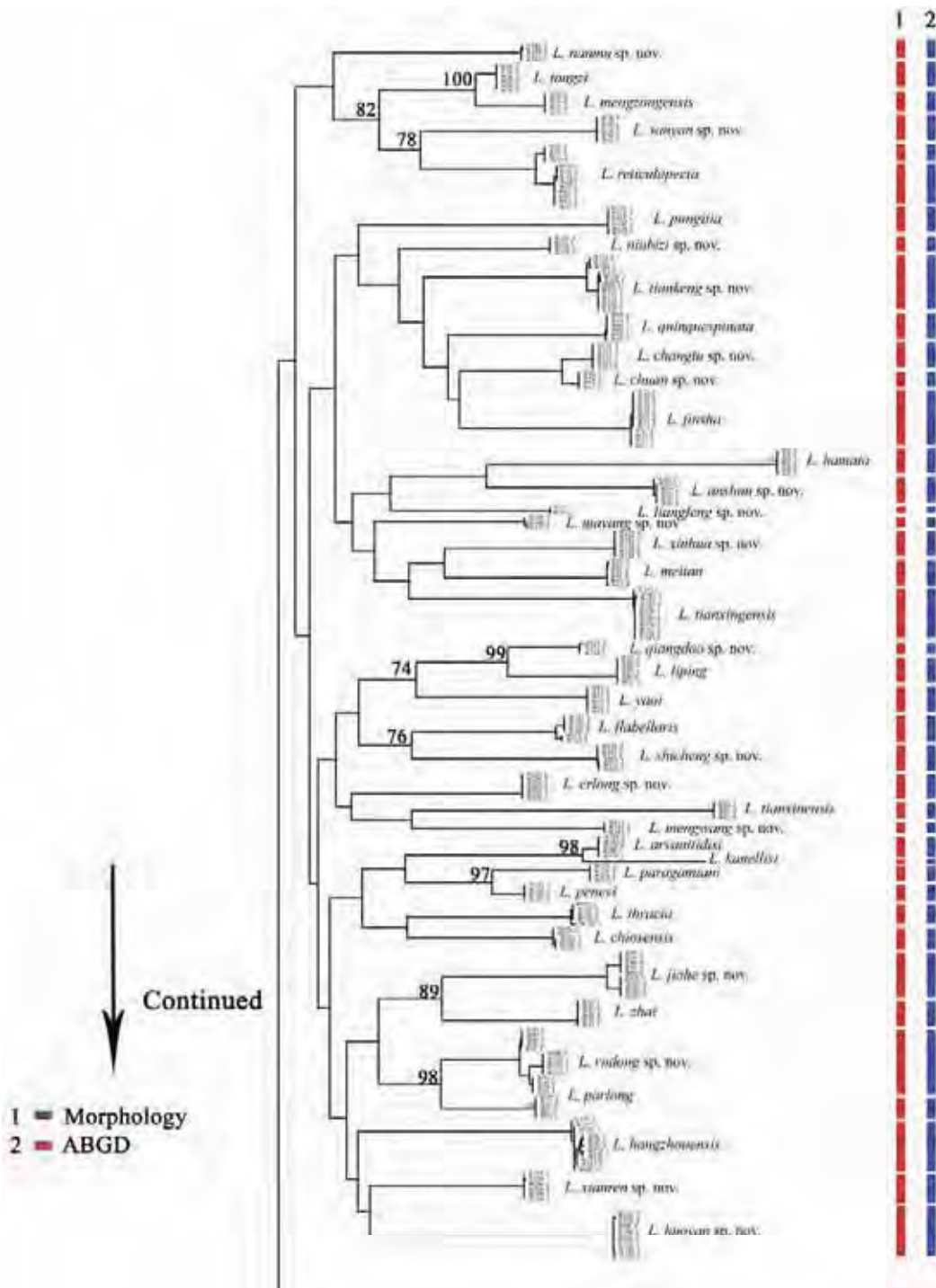
In total, 624 DNA barcodes were analyzed. A full list of the analyzed specimens can be found in the supporting information (S1 Table). Fragment lengths of the analyzed DNA barcodes ranged from 107 (0.005%) to 617bp (89%). For all populations, except *L. kanellisi* and *L. robustispina*, four or more DNA barcodes have been generated. All nucleotides were translated into functional protein sequences in the correct reading frame, with no stop codons or indels observed in the data. Similar to other arthropod studies, our data indicated a high AT-content for this mitochondrial gene fragment: the mean sequence compositions were A=20.5%, C=12.6%, G=24.4%, T= 41.4%.

#### Phylogenetic inference

The ML gene tree topology suggests that *Leptonetela* is monophyletic, with the node highly supported (Fig. 2; bootstrap value, BS = 92). Our analyses revealed all *Leptonetela* species

formed non-overlapping clusters, with bootstrap support value of 100. In contrast, relationships among putative species were

largely unresolved, usually with low bootstrap support on the ML gene tree, particularly at deeper phylogenetic levels.



**FIGURE 2** Maximum likelihood *COI* gene tree for 624 terminals of *Leptonetela*, with the results of two different species delimitation approaches (see legend)

Numbers near branches show bootstrap supports (>74). Species names and locality group terminals according to consensus results of species delimitation approaches.



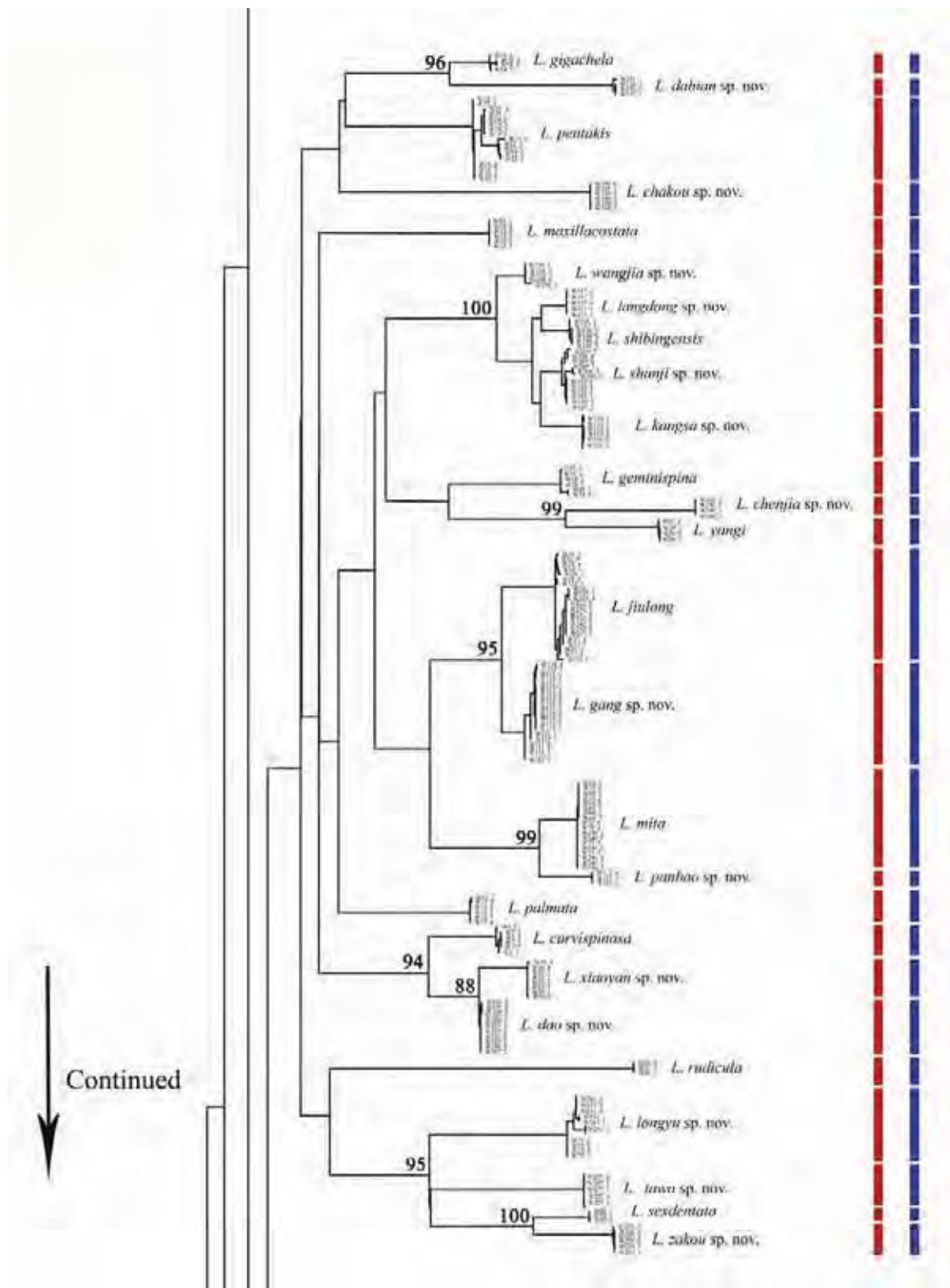


FIGURE 2 Continued

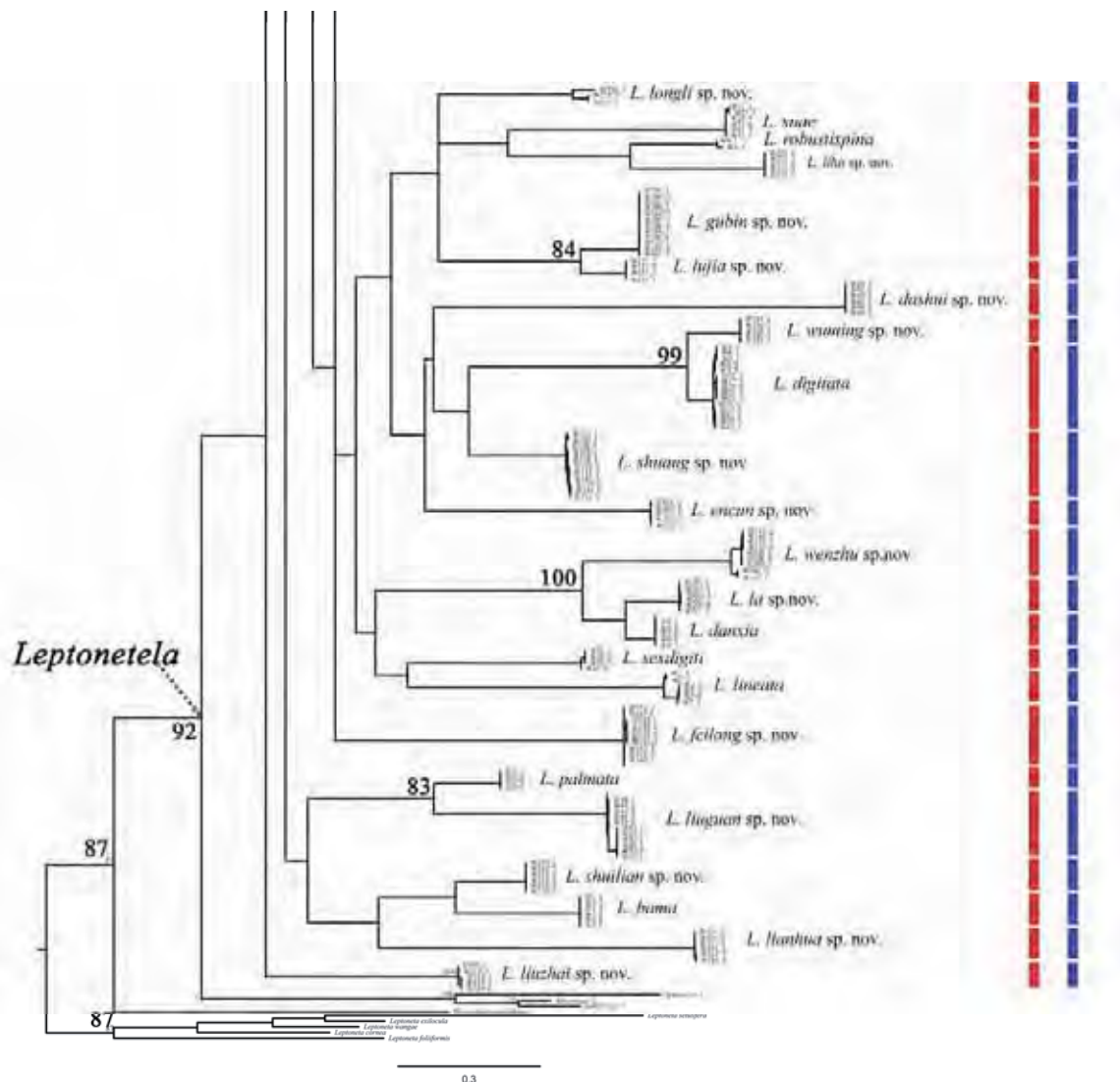


FIGURE 2 Continued

### Species delineation

DNA barcoding gap analysis: Based on our *a priori* species hypotheses, Interspecific divergences ranged from zero to 5.3%/5.0% (K2P/uncorrected p-distance) whereas interspecific distances were between 3.1%/3% and 31.9%/25% (K2P/uncorrected p-distance). Maximum intraspecific distances > 3% were found for 2 species, including *L. reticulopecta* (4.3%/4.0%), and *L. pentakis* Lin & Li, 2010 (5.3%/5%). The lowest interspecific distance were revealed for the 2 species pairs *L. changtu* Wang & Li sp. nov. with *L. chuan* Wang & Li sp. nov. and *L. kangsa* Wang & Li sp. nov. with *L. shibingensis* Guo, Yu & Chen, 2016 with a value of 3.1%/3%. Minimum interspecific pairwise distances < 5%, and > 3% were found for 2 species pairs: *L. shibingensis* with *L. shanji* Wang & Li sp. nov. and *L. dao* Wang & Li sp. nov. with *L. xiaoyan* Wang & Li sp. nov. The mean

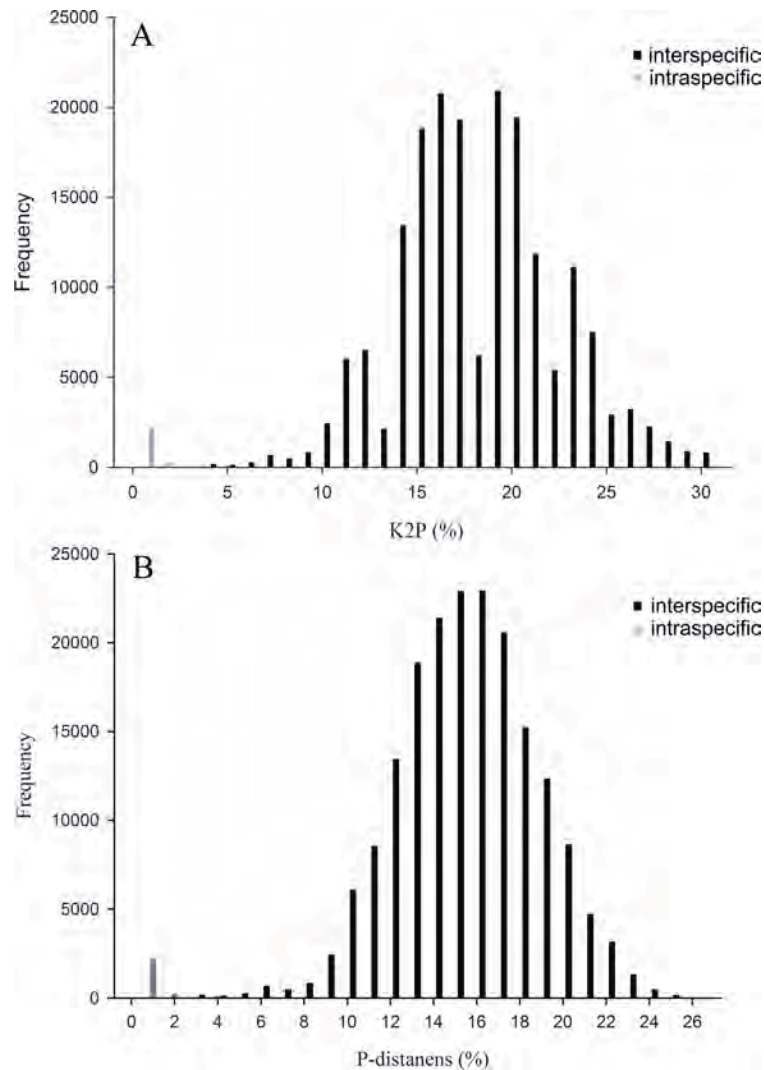
interspecific distance between the 90 tentative species was 17.9/15.6% (K2P/uncorrected p-distance), and the mean intraspecific distance within each species was 0.2% (both K2P and uncorrected p-distance) in *Leptonetela*. A histogram of the gap and overlap between intra- and interspecies genetic distances are show in Figure 3.

### ABGD analysis

The ABGD analyses of the COI dataset, using the originally specified parameter combinations and partitions resulted mostly in 90 distinct species, which correspond to the 90 species observed in the previous taxonomic hypotheses based on morphological identification. The result was the same regardless of the model of evolution employed (Jukes-Cantor (JC), K2P, Simple Distance). The settings Pmin/Pmax = 0.0001/0.2 yielded the most significant P values. However, at lower values of prior intraspecific distance

(P), recursive partition of ABGD recognized more species (Table 1), when  $P_{min}/P_{max} = 0.0001/0.2$ ,  $P$  values = 0.159, JC

and K2P distance resulted in 98 species, and resulted in 95 species in Simple distance.



**FIGURE 3 DNA barcoding for *Leptonetela***

Histograms show division of intraspecific (grey) and interspecific (black) COI sequence variation based on Kimira two-parameter (K2P, A) and uncorrected p-distance (B).

## DISCUSSION

DNA barcoding is widely recognized as a useful tool for species identification across the animal kingdom (Chesters et al., 2012; Wang et al., 2011). Our research represents an important step towards the application of DNA barcodes for identification of *Leptonetela* taxa. For 119 taxa (97%), our sequence data represent the first published DNA barcodes.

Classically, geographic isolation is considered a primary feature of troglobitic taxa (Hedin, 1997; Hedin & Thomas, 2010). Our DNA barcoding result is consistent with this view. And similar to other DNA barcoding studies, in which COI showed

high genetic structure between populations within species (Tavares et al., 2001). Our results showed high robustness with geographical genetic structure for COI, such as specimens in one cave or from closely associated cave systems formed a well supported cluster.

Choosing appropriate thresholds that can delimit species is one of the main challenges and concerns for DNA barcoding researches (Ferguson, 2002). Our DNA barcoding gap analysis shows an overlap in the range of intra- and interspecific COI sequence divergences. The interspecific genetic divergences between *L. chuan* Wang & Li sp. nov. and *L. changtu* Wang & Li sp. nov., *L. kangsa* Wang & Li sp. nov. and *L. shibingensis*, as well as between *L. shibingensis* and *L. shanji* Wang & Li sp. nov.

**Table 1 Results of the automatic barcode gap discovery (ABGD) analyses**

Substitution mode	Pmin/Pmax	X	Partation	Prior intraspecific divergence (P)								
				0.001	0.0017	0.0028	0.0046	0.0077	0.0129	0.0215	0.0359	
JC	0.001/0.1	1.5	Initial	90	90	90	90	90	90	90	90	90
			Recursive	171	136	136	106	106	99	92	90	
K2P	0.001/0.1	1.5	Initial	90	90	90	90	90	90	90	90	90
			Recursive	171	136	136	106	106	99	92	90	
Simple	0.001/0.1	1.5	Initial	90	90	90	90	90	90	90	90	90
			Recursive	105	105	105	97	96	95	92	90	
JC	0.001/0.1	1	Initial	90	90	90	90	90	90	90	90	90
			Recursive	169	132	132	106	106	99	92	90	
K2P	0.001/0.1	1	Initial	90	90	90	90	90	90	90	90	90
			Recursive	172	137	137	106	106	99	92	90	
Simple	0.001/0.1	1	Initial	90	90	90	90	90	90	90	90	90
			Recursive	105	105	105	97	96	95	92	90	
JC	0.0001/0.2	1.5	Initial	90	90	90	90	90	90	90	90	90
			Recursive	171	171	171	171	136	106	98	90	
K2P	0.0001/0.2	1.5	Initial	90	90	90	90	90	90	90	90	90
			Recursive	171	171	171	171	136	106	98	90	
Simple	0.0001/0.2	1.5	Initial	90	90	90	90	90	90	90	90	90
			Recursive	105	105	105	105	105	96	95	90	

was 3.1%/3.0% based on K2P/uncorrected and p-distance models. Compared with other species *L. chuan* Wang & Li sp. nov., and *L. changtu* Wang & Li sp. nov., *L. kangsa* Wang & Li sp. nov., *L. shibingensis* and *L. shanji* Wang & Li sp. nov. are more closely distributed. In morphology, *L. chuan* Wang & Li sp. nov. and *L. changtu* Wang & Li sp. nov. can be distinguished by the shape of the median apophysis and the conductor (median apophysis palm-shaped, edge decorated with sclerotized spots, conductor semicircular in *L. changtu* Wang & Li sp. nov., median apophysis rectangular, with 5 larger teeth distally, conductor triangular in ventral view in *L. chuan* Wang & Li sp. nov.); *L. kangsa* Wang & Li sp. nov., *L. shibingensis* and *L. shanji* Wang & Li sp. nov. can be distinguished by the location and shape pattern of male pedipalpal tibial spines (I spine located at the middle in *L. shibingensis* and *L. shanji* Wang & Li sp. nov.; I spine asymmetrically bifurcated in *L. shanji* Wang & Li sp. nov., male pedipalpal tibial I spine located at base and not bifurcated in *L. kangsa* Wang & Li sp. nov.). Nevertheless, we found two species with maximum pairwise distance >3%, including *L. reticulopecta* (specimens from Tianshegnqiao cave is clearly distant from the rest) with 4.3%/4.0%, *L. pentakis* (specimens from Liaoya cave is clearly distant from the rest) with 5.3%/5.0%. Then we achieved a threshold of 3.11%/3.0% (K2P/uncorrected and p-distance), excluding taxa from Tianshegnqiao cave and Liaoya cave. This threshold was interestingly close to the 3% commonly used in barcoding literature (Hebert et al., 2003a, b).

Here, we found a high identification success using ABGD. In ABGD analysis, the taxa from Tianshegnqiao cave and Liaoya cave were identified as *L. reticulopecta* and *L. pentakis*, respectively. Given the fact that all specimens of *L. reticulopecta* and *L. pentakis* are morphologically highly similar, we are currently unable to ascertain if the observed genetic distances simply represent a high level of interspecific variation or reflect cryptic distance between established new taxa. To answer this question, more specimens need to be collected and analyzed, using both morphological characters and nuclear sequence data.

In conclusion, our study demonstrates the power of an integrative approach, in which classical and DNA barcoding taxonomy complement each other and both contribute to a more accurate taxonomic classification.

### Taxonomy

#### Key to species of *Leptonetela*

(Mostly referring to characters of the male pedipalp)

- 1 Spermathecae thin and loosely twisted .....  
..... *L. strinatii* (Brignoli, 1976) (male unknown)
- Not as above .....2
- 2 Male pedipalp with median apophysis .....3
- Male pedipalp without median apophysis .....9
- 3 Median apophysis like pine needles, sclerotized .....4
- Not as above .....33



4	Median apophysis looks like 4 pine needle-like appendages	5	Conductor developed	23
-	Median apophysis divided into more or less 4 pine needles	5	- Conductor reduced	26
5	Tibial I spine strong, conspicuous, with bifurcated tip	6	23 Pedipalpal tibial I spine without bifurcated tip	24
-	Tibial II spine strong, located at the middle of tibia prolaterally	6	- Pedipalpal tibial I spine with bifurcated tip, other spines concentrated distally, tip of conductor bifurcated	24
6	Cymbium roughly double the length of bulb	6	..... <i>L. anshun</i> Lin & Li, 2010	
-	Cymbium roughly the same length as bulb	7	24 Conductor bamboo leaf-shaped in ventral view	25
7	Median apophysis divided into 15 pine needles	7	- Conductor C-shaped in ventral view, pedipalpal tibial I spine longest	25
-	Median apophysis divided into 2 pine needles	7	..... <i>L. dashui</i> Wang & Li sp. nov.	
8	Cymbium constricted medially, median apophysis divided into 5 pine needles	7	25 Pedipalpal tibial I spine strong, prolateral bulbal lobe reduced	25
-	Cymbium not constricted medially, median apophysis divided into 2 pine needles	8	..... <i>L. qiangdao</i> Wang & Li sp. nov.	
9	Male pedipalp with 5 tibial spines prolaterally	8	- Pedipalpal tibial I spine slender, prolateral bulbal lobe tongue shaped	25
-	Male pedipalp with more than 5 tibial spines prolaterally	8	..... <i>L. nuda</i> (Chen, Jia & Wang, 2010)	
10	Cymbium constricted and wrinkled medially	8	26 Cymbium with a distal and a proximal spine prolaterally, pedipalpal tibial spines equidistant	26
-	Cymbium not constricted or wrinkled medially	8	..... <i>L. curvispinosa</i> Lin & Li, 2010	
11	Tibial spines slender, and without bifurcated tip	8	- Not as above	27
-	Tibial spines strong, or with bifurcated tip	8	27 Pedipalpal tibial I spine slender, asymmetrically bifurcated	27
12	Prolateral lobe tongue-shaped	10	..... <i>L. wangjia</i> Wang & Li sp. nov.	
-	Prolateral lobe absent	10	- Not as above	28
13	Pedipalpal tibia with one spine significantly longer than others	10	28 Pedipalpal tibial I, II, and III spines concentrated in the mid of tibia, 2 additional spines located distally, prolateral bulbal lobe reduced	28
-	Pedipalp tibial I, II spines nearly the same length	10	..... <i>L. maxillacostata</i> Lin & Li, 2010	
14	Conductor bamboo leaf-shaped in ventral view	10	- Pedipalpal tibial I spine longest, located far from others, prolateral lobe small, tongue shaped	28
-	Conductor C-shaped ventrally	10	..... <i>L. chenjia</i> Wang & Li sp. nov.	
15	Embolus and conductor long, intersecting	10	29 Male pedipalp with 6 tibial spines retrolaterally	30
-	Embolus and conductor short, not intersecting	10	- Male pedipalp with 7 tibial spines retrolaterally	32
16	Pedipalpal tibial I spine with bifurcated tip	10	30 Pedipalpal tibial I, II spines strong, equally length, II spine asymmetrically bifurcated, conductor reduced	30
-	Pedipalpal tibial I spine without bifurcated tip	10	..... <i>L. gang</i> Wang & Li sp. nov.	
17	Pedipalpal tibial I spine strong, asymmetrically bifurcate	10	- Pedipalpal tibial spines slender, not bifurcated, conductor developed	31
-	Pedipalpal tibial I spine slender, symmetrically bifurcate	10	..... <i>L. gigachela</i> (Lin & Li, 2010)	
18	Pedipalpal tibial I spine located proximally at tibia, thin spines II, V and VI arranged in a triangle, conductor bamboo leaf-shaped in ventral view	10	31 Pedipalpal tibial with 2 large spines prolaterally, cymbium not constricted medially, earlobe-shaped process absent, and cymbium long, twice the length of bulb	31
-	Pedipalpal tibial I spine located at 1/3 of tibia, conductor C tile-shaped in ventral view	10	..... <i>L. wenzhu</i> Wang & Li sp. nov.	
19	Pedipalpal tibial I spine longest	10	32 Cymbium with 1 ox horn-shaped spine on the earlobe-shaped process, conductor thin, triangular in ventral view	31
-	Pedipalpal tibial II spine longest	10	..... <i>L. rudong</i> Wang & Li sp. nov.	
20	Pedipalpal tibial I spine bent distally, conductor reduced	10	- Earlobe-shaped process of cymbium without spine, conductor broad, C tile-shaped in ventral view	31
-	Pedipalpal tibial I spine not bent distally, conductor semicircular-shaped in ventral view	10	..... <i>L. la</i> Wang & Li sp. nov.	
21	Eyes absent, Pedipalpal tibial III, V and VI spines more slender than I, II spines	10	33 Median apophysis like mastoid process or lamelliform	34
-	Six eyes, Pedipalpal tibial spines equally strong	10	- Median apophysis finger-shaped or harrow-like	50
22	Conductor developed	10	34 Cymbium not constricted medially, earlobe-shaped process reduced	35
-	Conductor reduced	10	- Cymbium constricted medially, earlobe-shaped process developed	38
23	Pedipalpal tibial I spine without bifurcated tip	10	35 Male pedipalpal tibia with 6 spines retrolaterally	36
-	Pedipalpal tibial I spine with bifurcated tip, other spines concentrated distally, tip of conductor bifurcated	10	- Male pedipalpal tibia only with 5 spines retrolaterally	37
24	Conductor bamboo leaf-shaped in ventral view	10	36 Pedipalpal tibial with 4 long spines prolaterally, the retrolateral I spine longest, II III spines short and strong, median apophysis	36
-	Conductor C-shaped in ventral view, pedipalpal tibial I spine longest	10		
25	Pedipalpal tibial I spine strong, prolateral bulbal lobe reduced	10		
-	Pedipalpal tibial I spine slender, prolateral bulbal lobe tongue shaped	10		
26	Cymbium with a distal and a proximal spine prolaterally, pedipalpal tibial spines equidistant	10		
-	Not as above	10		
27	Pedipalpal tibial I spine slender, asymmetrically bifurcated	10		
-	Not as above	10		
28	Pedipalpal tibial I, II, and III spines concentrated in the mid of tibia, 2 additional spines located distally, prolateral bulbal lobe reduced	10		
-	Pedipalpal tibial I spine longest, located far from others, prolateral lobe small, tongue shaped	10		
29	Male pedipalp with 6 tibial spines retrolaterally	10		
-	Male pedipalp with 7 tibial spines retrolaterally	10		
30	Pedipalpal tibial I, II spines strong, equally length, II spine asymmetrically bifurcated, conductor reduced	10		
-	Pedipalpal tibial spines slender, not bifurcated, conductor developed	10		
31	Pedipalpal tibial with 2 large spines prolaterally, cymbium not constricted medially, earlobe-shaped process absent, and cymbium long, twice the length of bulb	10		
-	Pedipalpal tibial without prolateral spines, cymbium constricted medially, retrolaterally attaching an earlobe-shaped process, cymbium less than twice the length of bulb	10		
32	Cymbium with 1 ox horn-shaped spine on the earlobe-shaped process, conductor thin, triangular in ventral view	10		
-	Earlobe-shaped process of cymbium without spine, conductor broad, C tile-shaped in ventral view	10		
33	Median apophysis like mastoid process or lamelliform	10		
-	Median apophysis finger-shaped or harrow-like	10		
34	Cymbium not constricted medially, earlobe-shaped process reduced	10		
-	Cymbium constricted medially, earlobe-shaped process developed	10		
35	Male pedipalpal tibia with 6 spines retrolaterally	10		
-	Male pedipalpal tibia only with 5 spines retrolaterally	10		
36	Pedipalpal tibial with 4 long spines prolaterally, the retrolateral I spine longest, II III spines short and strong, median apophysis	10		

	mastoid, conductor bamboo leaf-shaped .....		"m" shaped, conductor triangular shaped .....
	..... <i>L. bama</i> Lin & Li, 2010		..... <i>L. feilong</i> Wang & Li sp. nov.
-	Pedipalpal tibial with 3 long spines prolaterally, the retrolateral I spine longest and strongest, median apophysis "M" shaped, conductor reduced .....		49 Pedipalpal tibial with 6 spines retrolaterally, I spine close to others, median apophysis flake-like, sclerotized distally, conductor broad, wavy line-shaped distally .....
	..... <i>L. yangi</i> Lin & Li, 2010		..... <i>L. tiangkeng</i> Wang & Li sp. nov.
37	Pedipalpal tibial with 1 long spine prolaterally, the retrolateral I spine longest and strongest, median apophysis mastoid, conductor bamboo leaf-shaped .....		- Pedipalpal tibial with 7 spines retrolaterally, I spine distant from others, median apophysis small worm-shaped, conductor thin, triangular .....
	..... <i>L. liping</i> Lin & Li, 2010		..... <i>L. lophacantha</i> (Chen, Jia & Wang, 2010)
-	Pedipalpal tibial with 3 long spines prolaterally, the retrolateral spine I slender, and longest, median apophysis obtuse-angled triangular, conductor narrow, triangular .....		50 Median apophysis index finger like .....
	..... <i>L. mayang</i> Wang & Li sp. nov.		- Median apophysis harrow-like .....
38	Cymbium with 1 strong spine on the earlobe-shaped process .....		51 Embolus bifurcated .....
	.....39		- Embolus not bifurcated .....
-	No spine on the earlobe-shaped process .....		52 Base of median apophysis swollen .....
	.....43		- Base of median apophysis not swollen .....
39	Male pedipalp tibia with 5 spines retrolaterally .....		53 Male pedipalpal tibia with 5 spines retrolaterally .....
	.....40		- Male pedipalpal tibia with 6 slender spines retrolaterally, I spine longest, conductor smooth, semicircular .....
-	Male pedipalpal tibia with more than 5 spines retrolaterally .....		..... <i>L. quinquespinata</i> (Chen & Zhu, 2008)
	.....41		54 Pedipalpal tibial I spine much stronger than II, asymmetrically bifurcated .....
40	Cymbium with 1 curved spine retrolaterally, median apophysis mastoid, with 3 sclerotized apices distally, conductor C tile-shaped .....		..... <i>L. jinsha</i> Lin & Li, 2010
	..... <i>L. jiahe</i> Wang & Li sp. nov.		- Pedipalpal tibial I spine similarly strong as II, not bifurcated .....
-	Cymbium without curved spine retrolaterally, median apophysis punctate in ventral view, conductor vestigial .....		.....55
	..... <i>L. panbao</i> Wang & Li sp. nov.		55 Cymbium constricted medially, earlobe-shaped process with 2 long curved spines retrolaterally, base of median apophysis distinctly swollen, conductor smooth, broad, semicircular .....
41	Pedipalpal tibial I spine strong, II spine asymmetrically bifurcated, median apophysis lamelliform, conductor triangular .....		..... <i>L. gubin</i> Wang & Li sp. nov.
	..... <i>L. julong</i> Lin & Li, 2010		- Cymbium not constricted medially, earlobe-shaped process small, base of median apophysis slightly swollen, conductor rugose, thin, triangular .....
-	Pedipalpal tibial I spine slender, not bifurcated .....		..... <i>L. lujia</i> Wang & Li sp. nov.
	.....42		56 Median apophysis bifurcated distally .....
42	Pedipalpal tibial with 3 long spines prolaterally, 6 spines retrolaterally, median apophysis semicircular .....		..... <i>L. wuming</i> Wang & Li sp. nov.
	..... <i>L. parlonga</i> Wang & Li, 2011		- Median apophysis not bifurcated distally .....
-	Pedipalpal tibial with 5 long spines prolaterally, 7 spines retrolaterally, median apophysis mita-shaped, embolus with 1 tooth distally .....		57 Pedipalpal tibial I spine located at the base of tibia .....
	..... <i>L. mita</i> Wang & Li, 2011		- Pedipalpal tibial I spine located medially .....
43	Pedipalpal tibial with 5 spines retrolaterally .....		58 Pedipalpal tibial I spine asymmetrically bifurcated, tibia with 4 long spines prolaterally .....
	.....44		..... <i>L. shibingensis</i> Guo, Yu & Chen, 2016
-	Pedipalpal tibial with more than 5 spines retrolaterally .....		- Pedipalpal tibial I spine not bifurcated .....
	.....49		..... <i>L. kangsa</i> Wang & Li sp. nov.
44	Pedipalpal tibial with 3 long spines prolaterally .....		59 Male Pedipalp tibia with 6 spines retrolaterally .....
	.....45		- Male Pedipalp tibia with 5 spines retrolaterally .....
-	Pedipalpal tibial with 1 or 2 long spines prolaterally .....		60 Pedipalpal tibial with 4 spines prolaterally, cymbium with 1 curved spine at the basal of retrolateral surface, median apophysis weakly sclerotized .....
	.....47		..... <i>L. xiaoyan</i> Wang & Li sp. nov.
45	Conductor C tile-shaped in ventral view .....		- Not as above .....
	.....46		61 Male Pedipalp tibia with 2 spines prolaterally, conductor short, broad and rugose .....
-	Conductor bamboo leaf-shaped in ventral view, the retrolateral spine I longest, median apophysis triangular-shaped .....		..... <i>L. oktocantha</i> Lin & Li, 2010
	..... <i>L. xianren</i> Wang & Li sp. nov.		- Male Pedipalp tibia without spine prolaterally, conductor smooth, semicircular .....
46	Pedipalpal tibial I spine longest, the rest concentrated at distal end of tibia, median apophysis mountain-shaped in ventral view .....		..... <i>L. hexacantha</i> Lin & Li, 2010
	..... <i>L. rudicula</i> Wang & Li, 2011		62 Median apophysis curved distally .....
-	Pedipalpal tibial I spine longest, I, II, and III spines strong, with the same degree in strong, median apophysis " ' " shaped in ventral view .....		- Median apophysis not curved distally .....
	..... <i>L. longli</i> Wang & Li sp. nov.		63 Cymbium with 1 ox horn-shaped spine on the earlobe-shaped process retrolaterally, tibia spines gradually shorted, conductor smooth, C tile-shaped .....
47	Pedipalpal tibial with 1 long spine prolaterally, median apophysis tongue-shaped, conductor triangular .....		..... <i>L. mengzongensis</i> Wang & Li, 2011
	..... <i>L. pungitia</i> Wang & Li, 2011		
-	Pedipalpal tibial with 2 long spines prolaterally .....		
	.....48		
48	Pedipalpal tibial I spine strongest, III-V spines in a triangular arrangement, median apophysis punctate, conductor triangular .....		
	..... <i>L. chiosensis</i> Wang & Li, 2011		
-	Pedipalpal tibial I spine longest, spine I-III with the same degree in strong, IV-V situated distally median apophysis		

- Cymbium without spine on the earlobe-shaped process retrolaterally .....	64	teeth and 1 large, ox horn-shaped tooth .....	
64 Male Pedipalp tibia with 2 long setae prolaterally, tibial I II and III spines equally in length, conductor broad, semicircular .....		..... <i>L. lianhua</i> Wang & Li sp. nov.	77 Pedipalpal tibial I spine longest.....
- Male Pedipalp tibia with 4 long spines prolaterally, tibial I II spines equally in length, conductor long, curved distally .....		..... <i>L. hamata</i> Lin & Li, 2010	- Pedipalpal tibial II spine longest.....
65 Pedipalpal tibial I spur strong .....	66	..... <i>L. tetracantha</i> Lin & Li, 2010	78 Median apophysis palmate, with six teeth distally .....
- Pedipalpal tibial I spine slender .....	70		..... <i>L. megaloda</i> (Chen, Jia & Wang, 2010)
66 Pedipalpal tibial I spine asymmetrically bifurcated .....	67		- Median apophysis EIK antler-like, with 4 small teeth and 1 large tooth, which bears 2 small teeth .....
- Pedipalpal tibial I spine not bifurcated, conductor broad, C tile-shaped, median apophysis distinctly sclerotized .....		..... <i>L. reticulopecta</i> Lin & Li, 2010	..... <i>L. niubizi</i> Wang & Li sp. nov.
67 Median apophysis tapering .....	68		79 Two large teeth on the periphery of median apophysis, 2 small teeth in the middle .....
- Median apophysis blunt .....	69		..... <i>L. hangzhouensis</i> (Chen, Shen & Gao, 1984)
68 Pedipalpal tibial I spine located at the middle of tibia .....		..... <i>L. shanji</i> Wang & Li sp. nov.	- Two large teeth on the periphery of median apophysis, 5 small teeth in the middle .....
- Pedipalpal tibial I spine located at the basal of tibia .....		..... <i>L. digitata</i> Lin & Li, 2010	..... <i>L. microdonta</i> (Xu & Song, 1983)
69 Pedipalpal tibial II-V spines slender flexible, I and II spines equally length, conductor shorter than median apophysis .....		..... <i>L. tianxinensis</i> (Tong & Li, 2008)	80 Median apophysis short and broad .....
- Pedipalpal tibial II spine slender, III spine strong, conductor longer than median apophysis .....		..... <i>L. nanmu</i> Wang & Li sp. nov.	- Median apophysis long and thin .....
70 Pedipalpal tibial I spine located at the base of tibia, other spines concentrated distally on tibia, conductor smooth, semicircular .....		..... <i>L. huoyan</i> Wang & Li sp. nov.	81 Pedipalpal tibial I spine strongest .....
- Not as above .....	71		- Pedipalpal tibial I spine not strongest .....
71 Pedipalpal tibial I II spines adjacent, the rest short, concentrated distally, outermost plumose, tibia with 2 spines prolaterally, conductor bifurcate .....		..... <i>L. geminispina</i> Lin & Li, 2010	82 Pedipalpal tibial I II spines equally strong, stronger than other 3 spines, median apophysis with 6 small teeth apically .....
- Pedipalpal tibial I-IV spines spaced at regular intervals, IV and V adjacent, tibia I-III equal in length, conductor short, C tile-shaped .....		..... <i>L. tianxingensis</i> Wang & Li, 2011	..... <i>L. identica</i> (Chen, Jia & Wang, 2010)
72 Median apophysis harrow-like, harrow pin reduced to sclerotized spots .....	73		- Pedipalpal tibial II III spines equally strong, spine II longest, median apophysis with 5 sharp teeth apically .....
- Median apophysis harrow-like, harrow pin not reduced .....	75		..... <i>L. meiwang</i> sp. nov.
73 Pedipalpal tibial spines slender, equally strong, median apophysis long, half the length of bulb .....		..... <i>L. liuguan</i> Wang & Li sp. nov.	83 Pedipalpal tibial I spine bifurcated .....
- Pedipalpal tibial spines not equally strong, median apophysis short, 1/5 the length of bulb .....	74		- Pedipalpal tibial I spine not bifurcated .....
74 Pedipalpal tibial I II spines equally strong, stronger than others, III-V in triangular arrangement, cymbium constricted medially, with one curved spine at the basal of contraction retrolaterally .....		..... <i>L. penevi</i> Wang & Li, 2016	84 Distal edge of median apophysis with 6 teeth .....
- Pedipalpal tibial I II III spines equally strong, stronger than others, III-V not triangular arrangement, cymbium not constricted medially .....		..... <i>L. changtu</i> Wang & Li sp. nov.	- Distal edge of median apophysis with 5 or 10 teeth .....
75 Harrow pin not constant in size .....	76		85 Teeth of median apophysis needle-shaped, earlobe-shaped process of cymbium absent; in the female, anterior margin of atrium with one mastoid process medially .....
- Harrow pin constant in size .....	80		..... <i>L. zakou</i> Wang & Li sp. nov.
76 Pedipalpal tibial I spine not bifurcated .....	77		- Teeth of median apophysis normal, cymbium with earlobe-shaped process, female anterior margin of atrium without mastoid process .....
- Pedipalpal tibial I spine strong, asymmetrically bifurcated, other 4 spines slender, median apophysis with 5 small			..... <i>L. sexdentata</i> Wang & Li, 2011
			86 Distal edge of median apophysis with 5 teeth, conductor C tile-shaped, tip of conductor wavy line-shaped; in the female, anterior margin of atrium with one mastoid process medially .....
			..... <i>L. longyu</i> Wang & Li sp. nov.
			- Distal edge of median apophysis with 10 teeth, conductor C tile-shaped, distal edge of conductor smooth; in the female, anterior margin of atrium without mastoid process .....
			..... <i>L. shicheng</i> Wang & Li sp. nov.
			87 Pedipalpal tibial I I spine tapering .....
			- Pedipalpal tibial I spine blunt .....
			..... <i>L. flabellaris</i> Wang & Li, 2011
			88 Distal edge of median apophysis with 5 teeth, conductor short, C tile-shaped .....
			..... <i>L. palmata</i> Lin & Li, 2010
			- Distal edge of median apophysis with 7 teeth, conductor long, triangular shaped .....
			..... <i>L. kanellisi</i> (Deeleman-Reinhold, 1971)
			89 Pedipalpal tibia with clusters of short spines dorsally .....
			- Pedipalpal tibia without clusters of short spines dorsally .....
			90 Distal edge of median apophysis linear, with 8 teeth .....
			..... <i>L. encun</i> Wang & Li sp. nov.
			- Distal edge of median apophysis semicircular, with 12 teeth .....
			..... <i>L. robustispina</i> (Chen, Jia & Wang, 2010)
			91 Base of pedipalpal tibia swollen .....
			92

- Base of pedipalpal tibia not swollen .....96
- 92 Pedipalpal tibial I spine bifurcate .....93
- Pedipalpal tibial I spine trifurcate .. *L. notabilis* (Lin & Li, 2010)
- 93 Conductor triangular, longer than median apophysis, median apophysis with 7 teeth .....94
- Conductor C tile-shaped, shorter than median apophysis, median apophysis with 6 teeth .....95
- 94 In female spermathecae not twisted distally .....  
..... *L. shuang* Wang & Li sp. nov.
- In female spermathecae twisted distally .....  
.....*L. sanchahe* (Chen, Jia & Wang, 2010)
- 95 In female spermathecae weakly twisted .....  
..... *L. sexdigiti* (Lin & Li, 2011)
- In female spermathecae strongly twisted .....  
..... *L. lihu* Wang & Li sp. nov.
- 96 Pedipalpal tibial I spine strongset .....97
- Pedipalpal tibial I II III spines equally strong, stronger than others .....103
- 97 Pedipalpal tibial I I spine bifurcate .....98
- Pedipalpal tibial I spine not bifurcate .....101
- 98 Pedipalpal tibial II–V spine slender, curved, equally strong .....99
- Pedipalpal tibial II–V spine not equally strong .....100
- 99 Distal edge of median apophysis with 6 teeth .....  
.....*L. arvanitidisi* Wang & Li, 2016
- Distal edge of median apophysis with 5 teeth .....  
..... *L. ertong* Wang & Li sp. nov.
- 100 Distal edge of median apophysis with 4 teeth, tibial II III spines equally strong, stronger than other 2 .....  
.....*L. tawo* Wang & Li sp. nov.
- Distal edge of median apophysis with 3 teeth, tibial III–V spines equally strong, slender than spine II .....  
.....*L. paragamiani* Wang & Li, 2016
- 101 Pedipalpal tibial II–V spines equally strong .....102
- Pedipalpal tibial III–V spines equally strong, slender than spine II, distal edge of median apophysis with 4 teeth .....  
.....*L. deltshevi* (Brignoli, 1979)
- 102 Distal edge of median apophysis with 5 teeth, conductor C tile-shaped .....*L. gittenbergeri* Wang & Li, 2011
- Distal edge of median apophysis with 6 teeth, conductor semicircular .....*L. zhai* Wang & Li, 2011
- 103 Pedipalpal tibial I II spines equally strong .....  
.....*L. thracia* Gasparo, 2005
- Pedipalpal tibial I I–III spines equally strong .....104
- 104 Distal edge of median apophysis with 3 teeth, tibia with 3 large spines prolaterally .....*L. dabian* Wang & Li sp. nov.
- Distal edge of median apophysis with 6 teeth, tibia with 6 long setae prolaterally ..... *L. chuan* Wang & Li sp. nov.

**Family Leptonetidae Simon, 1890**

**Genus *Leptonetela* Kratochvíl, 1978**

**Type species:** *Leptonetela kanellisi* (Deeleman-Reinhold, 1971) from Greece.

**Diagnosis.** The genus *Leptonetela* can be distinguished from other leptonetid genera by the following combination of male

pedipalpal characters: femur spineless and tibia with a longitudinal row of spines on the retrolateral surface.

**Redescription.** Carapace yellowish or white. Sternum shield. Opisthosoma gray, ovoid, covered with short hairs. Male pedipalpal patella with one short spine dorso-distally; tibia with trichobothria dorsally; cymbium with strong, thorny spine distally; bulb yellowish, ovoid, with two appendages inserted ventrally, median apophysis chitinous, conductor membranous, median apophysis and conductor absent in some species, embolus transparent, membranous. Female genital area covered with short hairs. Vulva with a pair of spermathecae and sperm ducts, spermathecae twisted and weakly sclerotized.

**Distribution.** Greece, Turkey, Georgia, Azerbaijan, Vietnam and China.

***Leptonetela chakou* Wang & Li sp. nov.**

**Figs 4–5, 97**

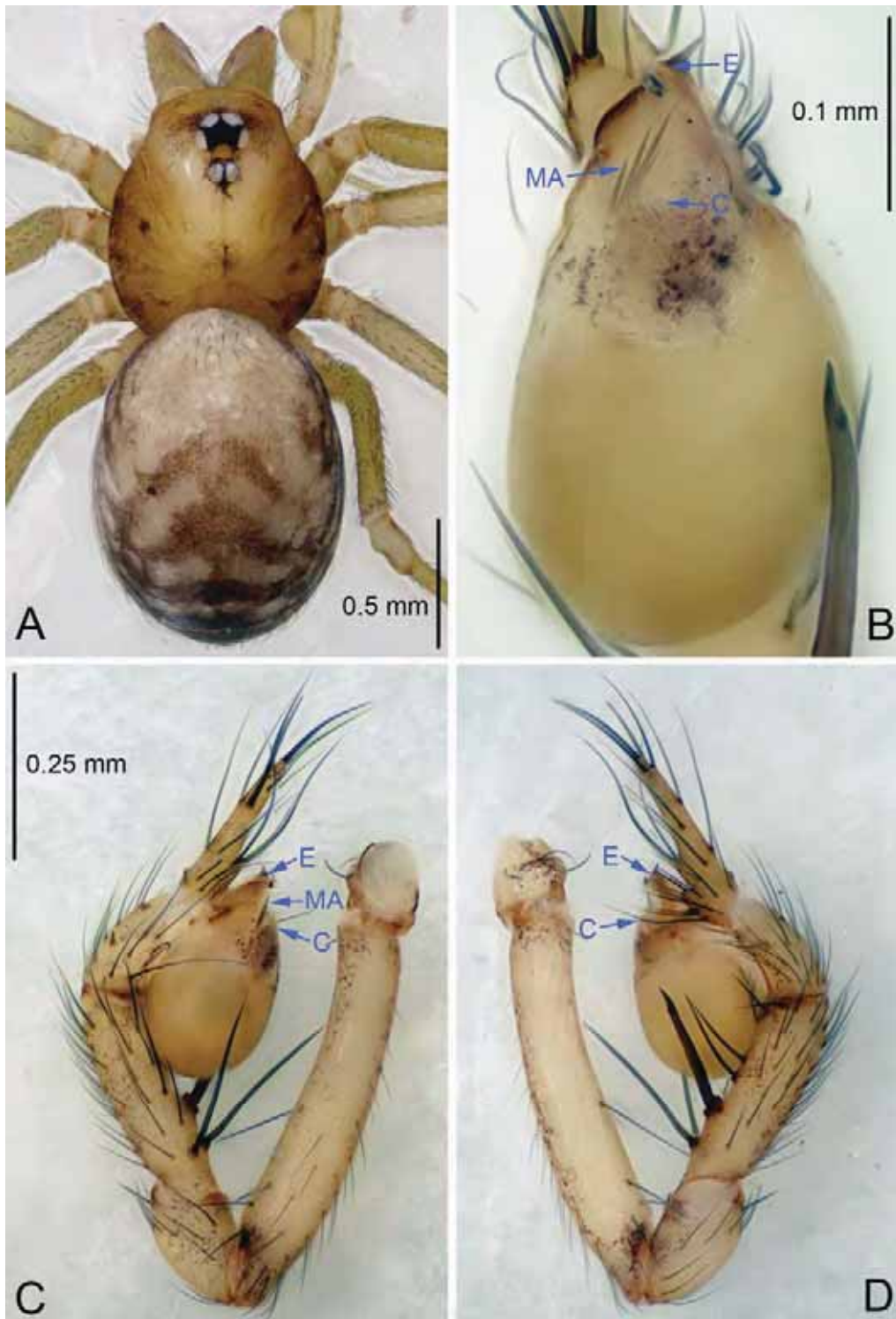
**Type material. Holotype:** male (IZCAS), Chakou Cave, 27.93°N, 106.14°E, Shalang, Shibao Town, Gulin County, Luzhou City, Sichuan Province, China, 20 April 2014, Y. Li, H. Zhao & Y. Lin leg. **Paratypes:** 1 male and 3 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. dao* Wang & Li sp. nov., *L. grandispina* Lin & Li, 2010, *L. liuzhai* Wang & Li sp. nov., *L. pentakis* Lin & Li, 2010, and *L. shuilian* Wang & Li sp. nov., but can be distinguished by the male pedipalpal tibia with 5 spines retrolaterally, the basal spine strong, conspicuous and with a bifurcate tip (Fig. 4D) (6 short spines, with spine II largest in *L. grandispina*, 5 slender spines in *L. dao* Wang & Li sp. nov., *L. liuzhai* Wang & Li sp. nov., *L. pentakis* and *L. shuilian* Wang & Li sp. nov.); the median apophysis divided into 4 pine needle like structures (Fig. 4B) (median apophysis divided into 2 pine needle like structures in *L. dao* Wang & Li sp. nov. and *L. shuilian* Wang & Li sp. nov., 15 pine needle like structures in *L. liuzhai* Wang & Li sp. nov., and 5 pine needle like structures in *L. pentakis*); from *L. dao* Wang & Li sp. nov., *L. grandispina*, *L. pentakis* by the conductor reduced in this new species (Fig. 1B); from *L. liuzhai* Wang & Li sp. nov. by the cymbium 1.3 times longer than bulb (Figs 4C–D) (cymbium 2 times longer than bulb in *L. liuzhai* Wang & Li sp. nov. and *L. shuilian* Wang & Li sp. nov.).

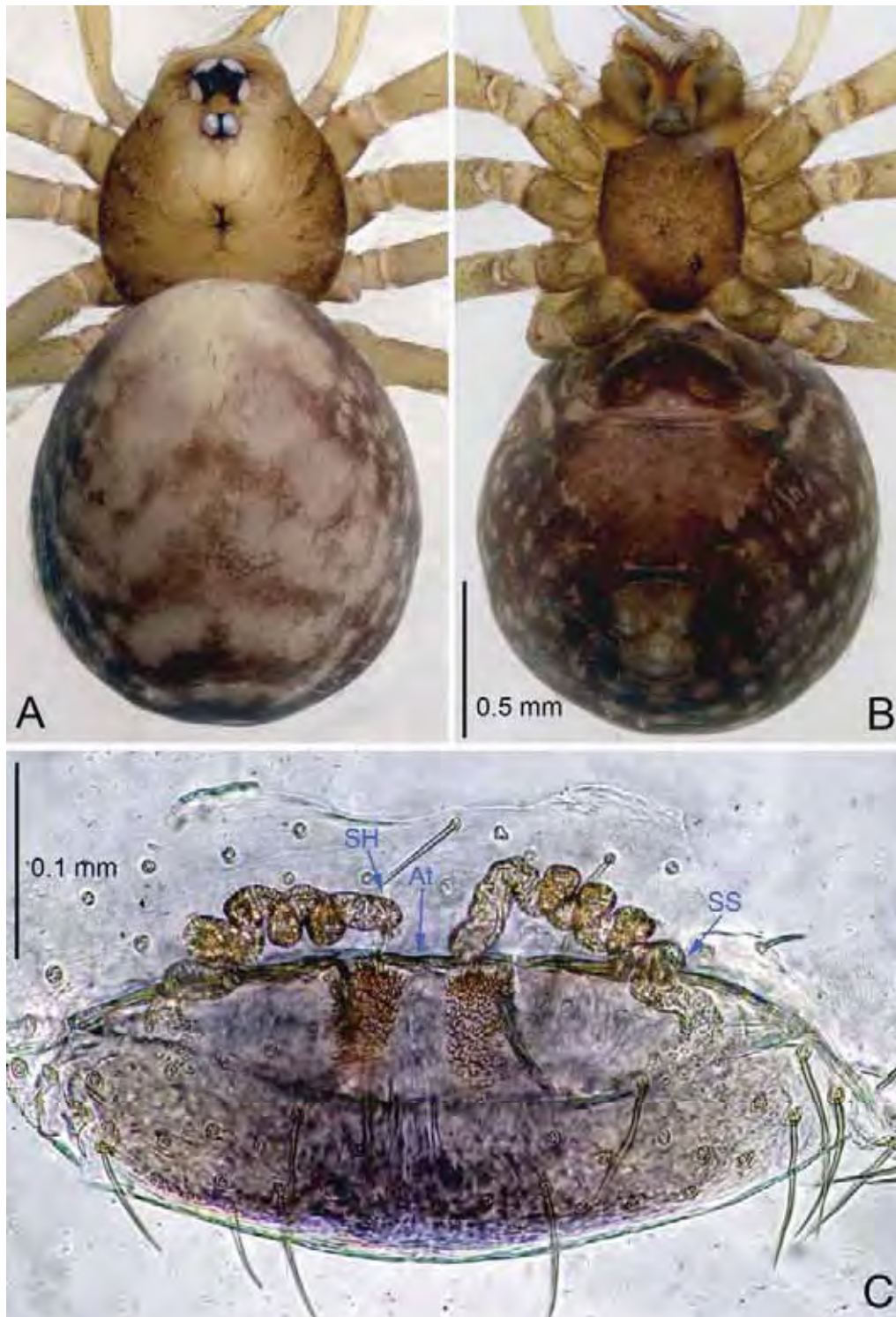
**Description. Male (holotype).** Total length 2.25 (Fig. 4A). Carapace 0.87 long, 0.87 wide. Opisthosoma 1.50 long, 1.00 wide. Carapace brown. Eyes six. Median groove, cervical grooves and radial furrows distinct. Clypeus 0.13 high. Opisthosoma gray, ovoid, with pigmented stripe. Leg measurements: I 7.63 (2.05, 0.35, 2.35, 1.75, 1.13); II 5.71 (1.63, 0.30, 1.60, 1.30, 0.88); III 4.73 (1.25, 0.30, 1.13, 1.20, 0.85); IV 6.30 (1.75, 0.35, 1.75, 1.45, 1.00). Male pedipalp (Figs 4C–D): tibia with 2 large spines prolaterally, and 5 spines retrolaterally, I spine strong,





**FIGURE 4** *Leptonetela chakou* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



**FIGURE 5** *Leptonetela chakou* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

conspicuous, tip bifurcated. Cymbium constricted medially, attaching an earlobe-shaped process. Embolus triangular, bearing a basal tooth. Median apophysis sclerotized, divided into 4 pine needle like structures. Conductor membranous, reduced (Fig. 4B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.27 (Figs 5A–B). Carapace 0.88 long, 0.80 wide. Opisthosoma 1.50 long, 1.25 wide. Clypeus 0.12 high. Leg measurements: I 5.83 (1.50, 0.35, 1.55, 1.38, 1.05); II 4.43 (1.13, 0.30, 1.25, 1.00, 0.75); III 3.62 (1.00, 0.25, 1.00, 0.75, 0.62); IV 4.96 (1.38, 0.35, 1.35, 1.13, 0.75). Vulva (Fig. 5C): spermathecae coiled, atrium fusiform.

**Distribution.** China (Sichuan).

***Leptonetela dao* Wang & Li sp. nov.**  
Figs 6–7, 97

**Type material. Holotype:** male (IZCAS), Dao Cave, 27.19°N, 105.06°E, Shuanglong, Salaxi County, Bijie City, Guizhou Province, China, 18 November 2011, H. Chen & Z. Zha leg.

**Paratypes:** 1 male and 20 females, same data as holotype; 5 males and 7 females, Shanlanqiao Cave, 26.28°N, 106.04°E, Shanlanqiao, Qianyanqiao Town, Anshun City, Guizhou Province, China, 04 November 2011, H. Chen & Z. Zha leg.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. chakou* Wang & Li sp. nov., *L. grandispina* Lin & Li, 2010, *L. liuzhai* Wang & Li sp. nov., *L. pentakis* Lin & Li, 2010, and *L. shuilian* Wang & Li sp. nov., but can be separated from *L. chakou* Wang & Li sp. nov., *L. grandispina*, *L. liuzhai* Wang & Li sp. nov. and *L. pentakis* by median apophysis divided into 2 pine needle (Fig. 6B) (median apophysis divided into 4 pine needle like structures in *L. chakou* Wang & Li sp. nov. and *L. grandispina*, 15 pine needle like structures in *L. liuzhai* Wang & Li sp. nov., and 5 pine needle like structures in *L. pentakis*); from *L. chakou* Wang & Li sp. nov., *L. grandispina* by the tibial spines slender (Fig. 6D) (the tibial I spine in *L. chakou* Wang & Li sp. nov. and II spine in *L. grandispina* strong); from *L. chakou* Wang & Li sp. nov., *L. pentakis* by the cymbium not constricted medially (Fig. 6C); from *L. liuzhai* Wang & Li sp. nov. and *L. shuilian* Wang & Li sp. nov. by the cymbium 1.2 times longer than bulb (Figs 6C–D) (cymbium 2 times longer than bulb in *L. liuzhai* Wang & Li sp. nov. and *L. shuilian* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 2.28 (Fig. 6A). Carapace 1.15 long, 1.03 wide. Opisthosoma 1.28 long, 0.93 wide. Carapace brown. Eyes six, reduced to white vestiges. Median groove, cervical grooves and radial furrows distinct. Clypeus 0.15 high. Opisthosoma gray, ovoid. Leg measurements: I 10.36 (2.76, 0.40, 3.24, 2.40, 1.56); II 8.72 (2.44, 0.36, 2.60, 1.72, 1.60); III 6.20 (2.04, 0.32, 1.52, 1.40, 0.92); IV 8.80 (2.56, 0.40, 2.60, 2.04, 1.20). Male pedipalp (Figs 6C–D): tibia with 5

slender spines prolaterally and 5 slender spines retrolaterally, with I spine longest. Cymbium not wrinkled, earlobe-shaped process small. Embolus triangular, prolateral lobe small, oval. Median apophysis sclerotized, divided into 2 pine needle like structures. Conductor broad, C tile-shaped in ventral view (Fig. 6B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with longer legs. Total length 2.76 (Figs 7A–B). Carapace 1.13 long, 1.10 wide. Opisthosoma 1.65 long, 1.40 wide. Clypeus 0.13 high. Leg measurements: I 11.36 (3.00, 0.40, 3.60, 2.60, 1.76); II 9.08 (2.64, 0.36, 2.80, 1.88, 1.40); III 7.44 (2.24, 0.36, 1.96, 1.64, 1.24); IV 9.68 (2.80, 0.40, 3.00, 2.08, 1.40). Vulva (Fig. 7C): spermathecae coiled, atrium triangular, anterior margin of the atrium with short hairs.

**Distribution.** China (Guizhou).

***Leptonetela liuzhai* Wang & Li sp. nov.**  
Figs 8–9, 97

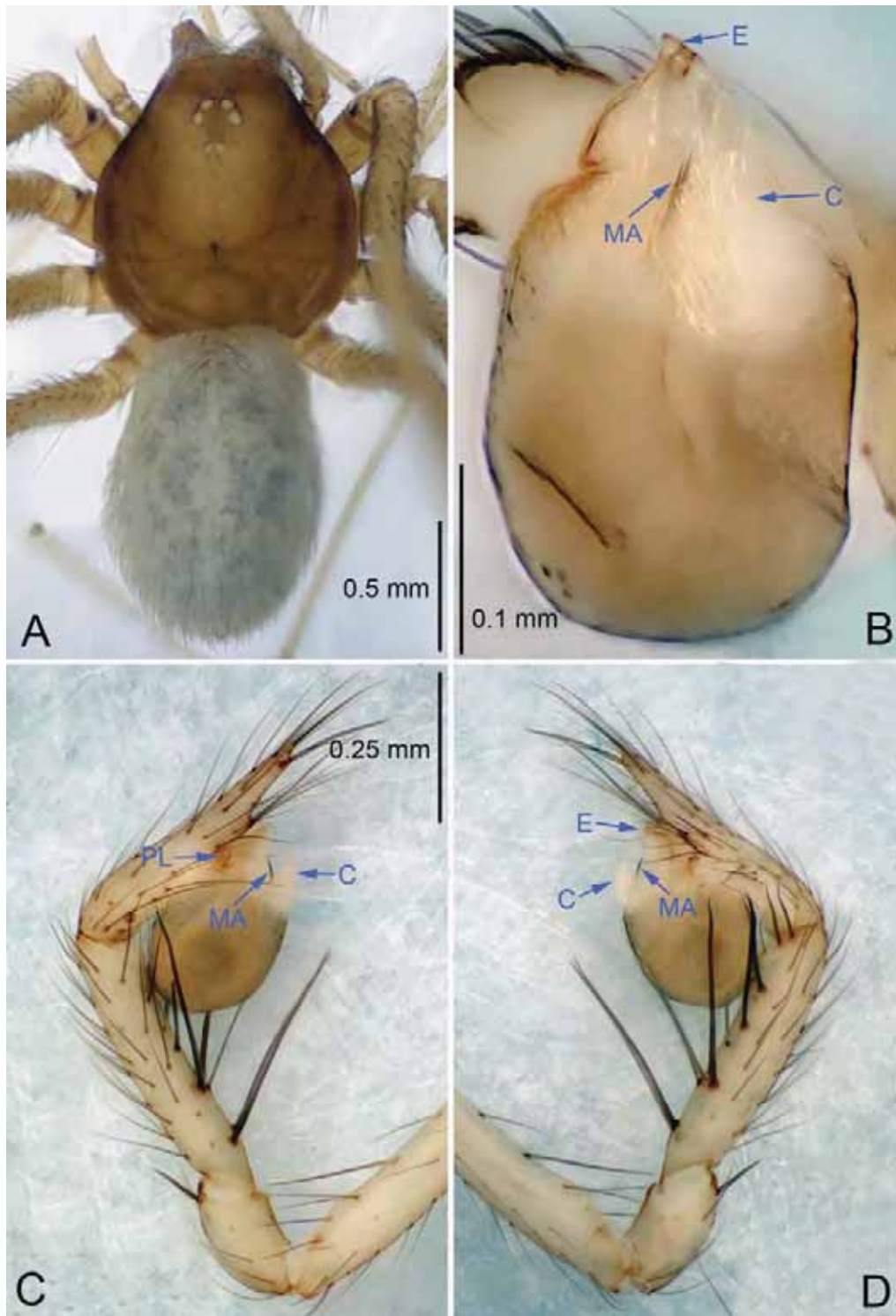
**Type material. Holotype:** male (IZCAS), nameless Cave, 25.27°N, 107.43°E, Longli, LiuzhaiTown, Nandan County, Hechi City, Guangxi Zhuang Autonomous Region, China, 29 January 2015, Y. Li & Z. Chen leg. **Paratypes:** 2 males and 6 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. chakou* Wang & Li sp. nov., *L. dao* Wang & Li sp. nov., *L. grandispina* Lin & Li, 2010, *L. pentakis* Lin & Li, 2010, and *L. shuilian* Wang & Li sp. nov. but can be separated from *L. chakou* Wang & Li sp. nov., *L. dao* Wang & Li sp. nov., *L. grandispina*, and *L. pentakis* by the male pedipalpal cymbium double the length of bulb, median apophysis divided into 15 pine needle like structures (Fig. 8B) (cymbium not double the length of bulb in *L. chakou* Wang & Li sp. nov., *L. dao* Wang & Li sp. nov., *L. grandispina*, and *L. pentakis*; median apophysis with 4 pine needles in *L. chakou* Wang & Li sp. nov. and *L. grandispina*, 2 pine needles in *L. dao* Wang & Li sp. nov. and *L. shuilian* Wang & Li sp. nov., and 5 pine needles in *L. pentakis*); from *L. chakou* Wang & Li sp. nov., and *L. grandispina* by the tibial spines slender (Fig. 8D) (I tibial spine in *L. chakou* Wang & Li sp. nov. and II spine in *L. grandispina* strong); from *L. chakou* Wang & Li sp. nov., and *L. pentakis* by the cymbium not constricted medially in this new species (Figs 8C–D).

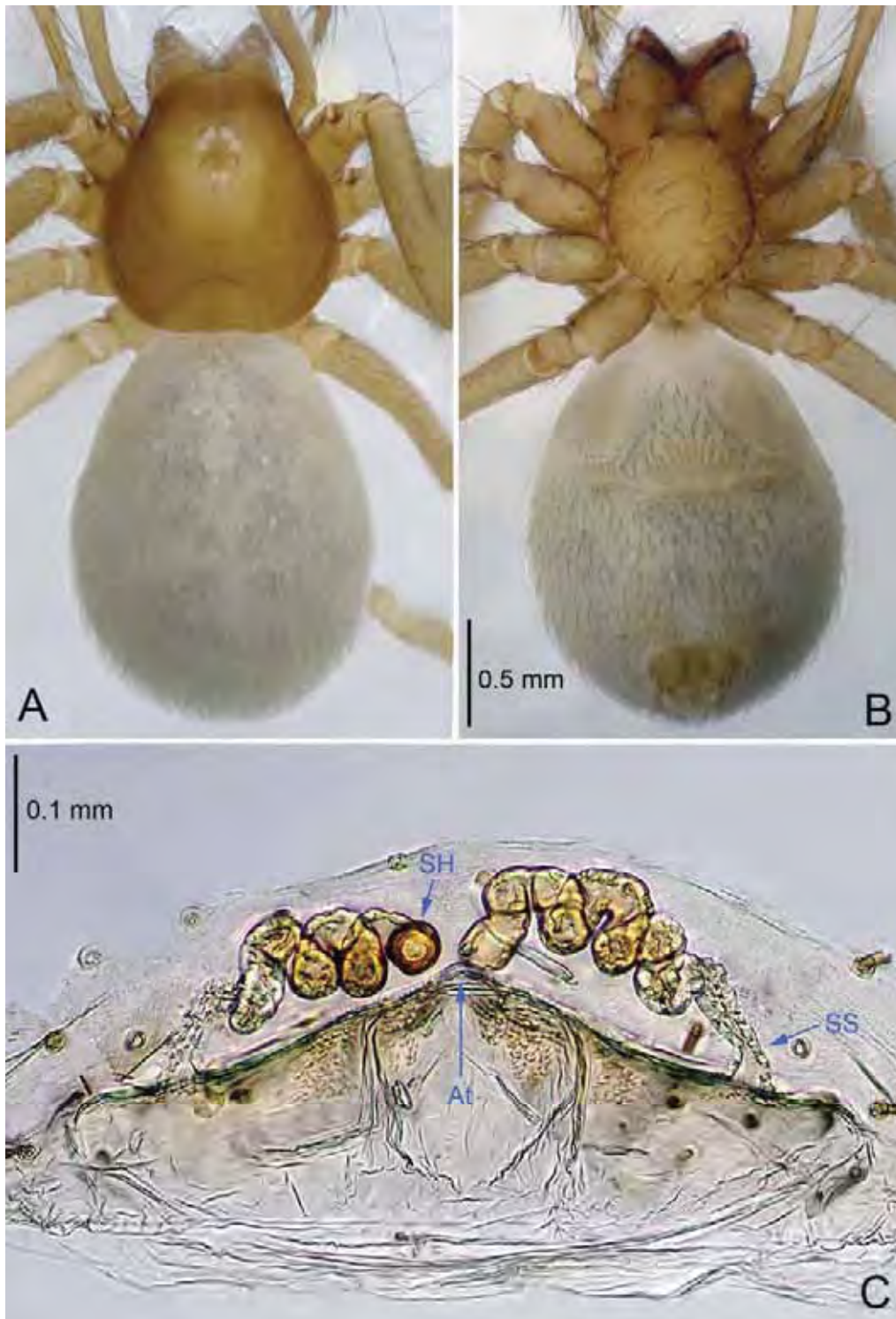
**Description. Male (holotype).** Total length 2.25 (Fig. 8A). Carapace 1.00 long, 0.88 wide. Opisthosoma 1.35 long, 1.10 wide. Carapace yellowish. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, cervical grooves and radial furrows distinct. Clypeus 0.15 high. Opisthosoma gray, ovoid. Leg measurements: I 8.30 (2.25, 0.25, 2.35, 1.95, 1.50); II 6.68 (1.88, 0.25, 2.00, 1.55, 1.00); III 5.70 (1.63, 0.20, 1.62, 1.35, 0.90); IV 7.49 (2.13, 0.25, 2.13, 1.85, 1.13). Male pedipalp (Figs 8C–D): tibia with 5 long spines prolaterally and 5 spines



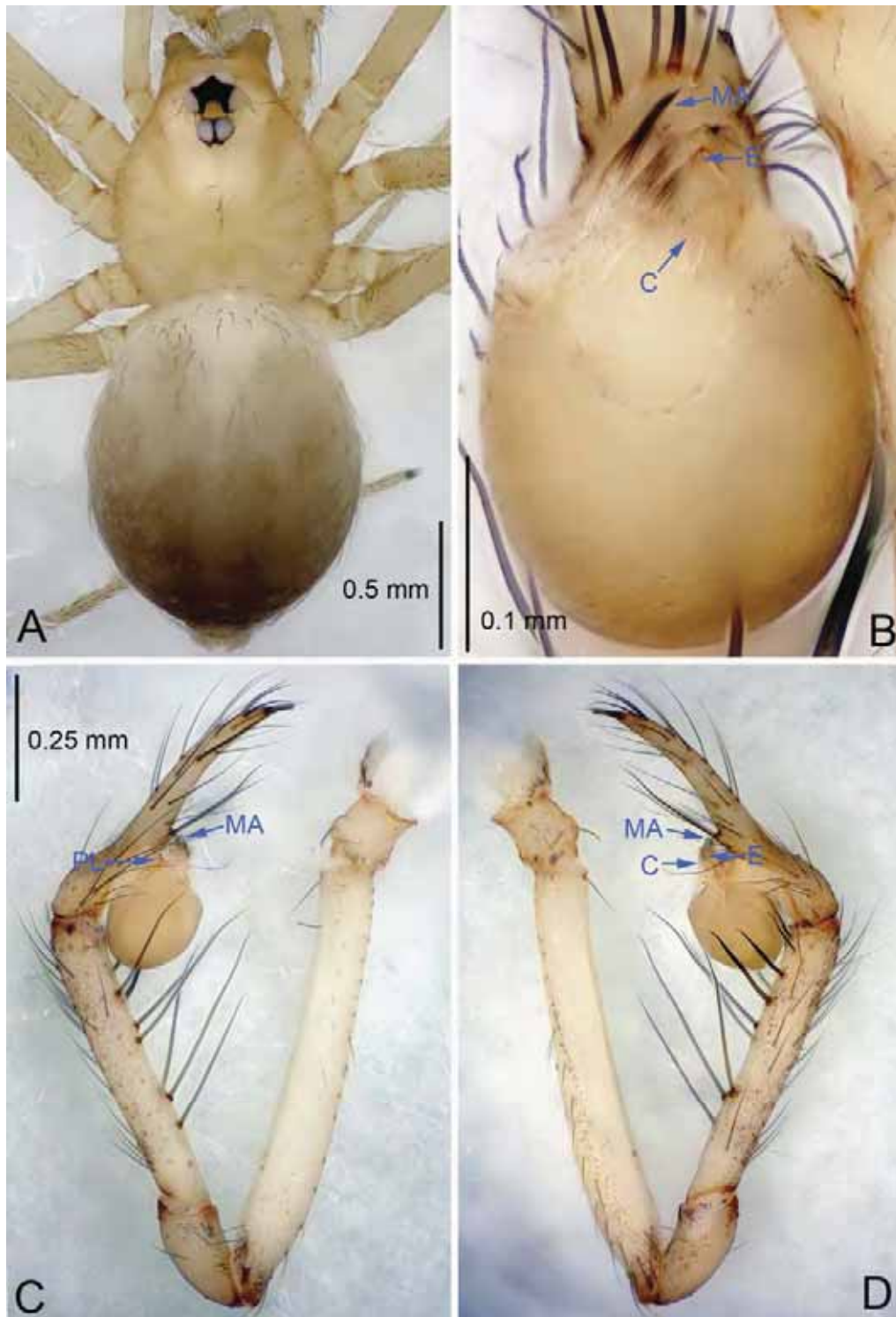


**FIGURE 6** *Leptonetela dao* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



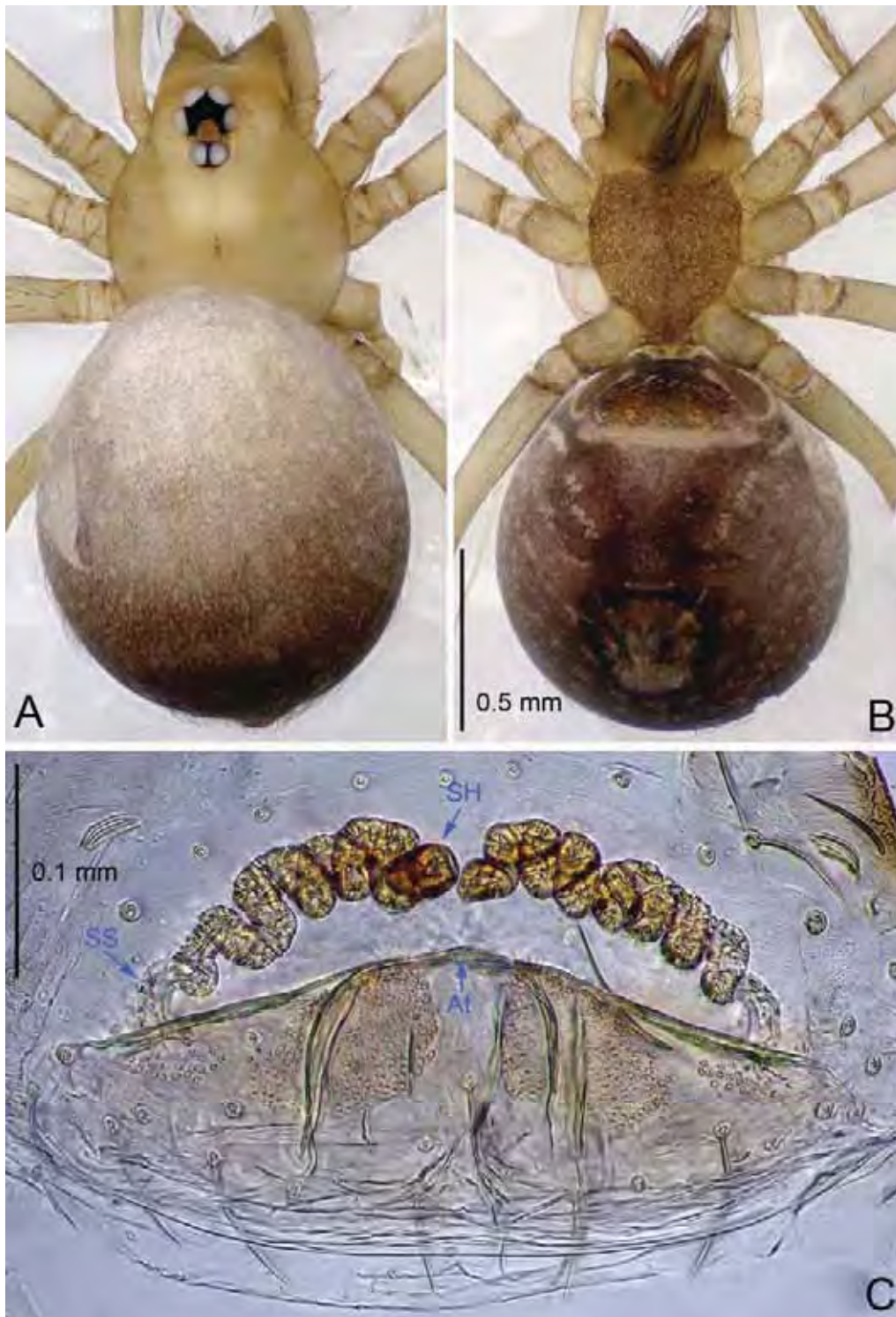


**FIGURE 7** *Leptonetela dao* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 8** *Leptonetela liuzhai* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





**FIGURE 9** *Leptonetela liuzhai* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

retrolaterally, with I spine longest. Cymbium not wrinkled, earlobe-shaped process small, cymbium double the length of bulb. Embolus triangular, prolateral lobe reduced. Median apophysis sclerotized, divided into 15 pine needle like structures. Conductor reduced (Fig. 8B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.50 (Figs 9A–B). Carapace 1.50 long, 0.88 wide. Opisthosoma 1.13 long, 1.38 wide. Clypeus 0.13 high. Leg measurements: I 7.30 (2.00, 0.25, 2.25, 1.75, 1.05); II 5.51 (1.63, 0.20, 1.55, 1.25, 0.88); III 4.76 (1.38, 0.25, 1.25, 1.13, 0.75); IV 6.50 (1.87, 0.25, 1.88, 1.50, 1.00). Vulva (Fig. 9C): spermathecae coiled, atrium fusiform.

**Distribution.** China (Guangxi).

***Leptonetela shuilian* Wang & Li sp. nov.**  
Figs 10–11, 97

**Type material. Holotype:** male (IZCAS), Shuilian Cave, 24.43°N, 106.97°E, Pingle, Fengshan County, Hechi City, Guangxi Zhuang Autonomous Region, China, 22 March 2015, Y. Li & Z. Chen leg. **Paratypes:** 6 males and 4 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. chakou* Wang & Li sp. nov., *L. dao* Wang & Li sp. nov., *L. grandispina* Lin & Li, 2010, *L. pentakis* Lin & Li, 2010, and *L. liuzhai* Wang & Li sp. nov. but can be separated from *L. chakou* Wang & Li sp. nov., *L. dao* Wang & Li sp. nov., *L. grandispina* Lin & Li, 2010, *L. pentakis* Lin & Li, 2010 by the male pedipalpal cymbium double the length of bulb; from *L. chakou* Wang & Li sp. nov., *L. grandispina*, *L. liuzhai* Wang & Li sp. nov. and *L. pentakis* by the median apophysis divided into 2 pine needle like structures in *L. chakou* Wang & Li sp. nov. (Fig. 10B) (median apophysis divided into 4 pine needle like structures in *L. chakou* Wang & Li sp. nov. and *L. grandispina*, 15 pine needle like structures in *L. liuzhai* Wang & Li sp. nov., and 5 pine needle like structures in *L. pentakis*); from *L. chakou* Wang & Li sp. nov., *L. grandispina* by the tibial spines slender (Fig. 10D) (I tibial spine in *L. chakou* Wang & Li sp. nov. and II spine in *L. grandispina* strong); from *L. chakou* Wang & Li sp. nov. and *L. pentakis* by the cymbium not constricted medially in this new species.

**Description. Male (holotype).** Total length 2.25 (Fig. 10A). Carapace 1.13 long, 1.00 wide. Opisthosoma 1.25 long, 0.90 wide. Carapace yellow. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.12 high. Opisthosoma gray, ovoid. Leg measurements: I - (2.63, -, 2.88, 2.35, 1.60); II - (2.13, -, 2.25, 2.00, 1.10); III - (1.88, -, 1.75, 1.50, 0.95); IV - (2.38, -, 2.38, 2.10, 1.25). Male pedipalp (Figs 10C–D): tibia with 3 long spines prolaterally, and 5 spines retrolaterally, with I spine

longest, tip bifurcated. Cymbium not wrinkled, earlobe-shaped process absent, cymbium double the length of bulb. Embolus spoon-shaped; prolateral lobe reduced. Median apophysis sclerotized, divided into 2 sharp pine needle like structures. Conductor reduced (Fig. 10B).

**Female (one of the paratypes).** Similar to male in color and general features, but smaller and with shorter legs. Total length 2.10 (Figs 11A–B). Carapace 1.00 long, 0.85 wide. Opisthosoma 1.50 long, 1.13 wide. Clypeus 0.10 high. Leg measurements: I 7.30 (1.75, 0.35, 2.25, 1.70, 1.25); II 5.33 (1.40, 0.30, 1.63, 1.00, 1.00); III 5.01 (1.25, 0.25, 1.38, 1.25, 0.88); IV 6.48 (1.60, 0.30, 1.88, 1.60, 1.10). Vulva (Fig. 11C): spermathecae coiled, apical part free, atrium semicircular, anterior margin of the atrium with short hairs.

**Distribution.** China (Guangxi).

***Leptonetela chenja* Wang & Li sp. nov.**  
Figs 12–13, 97

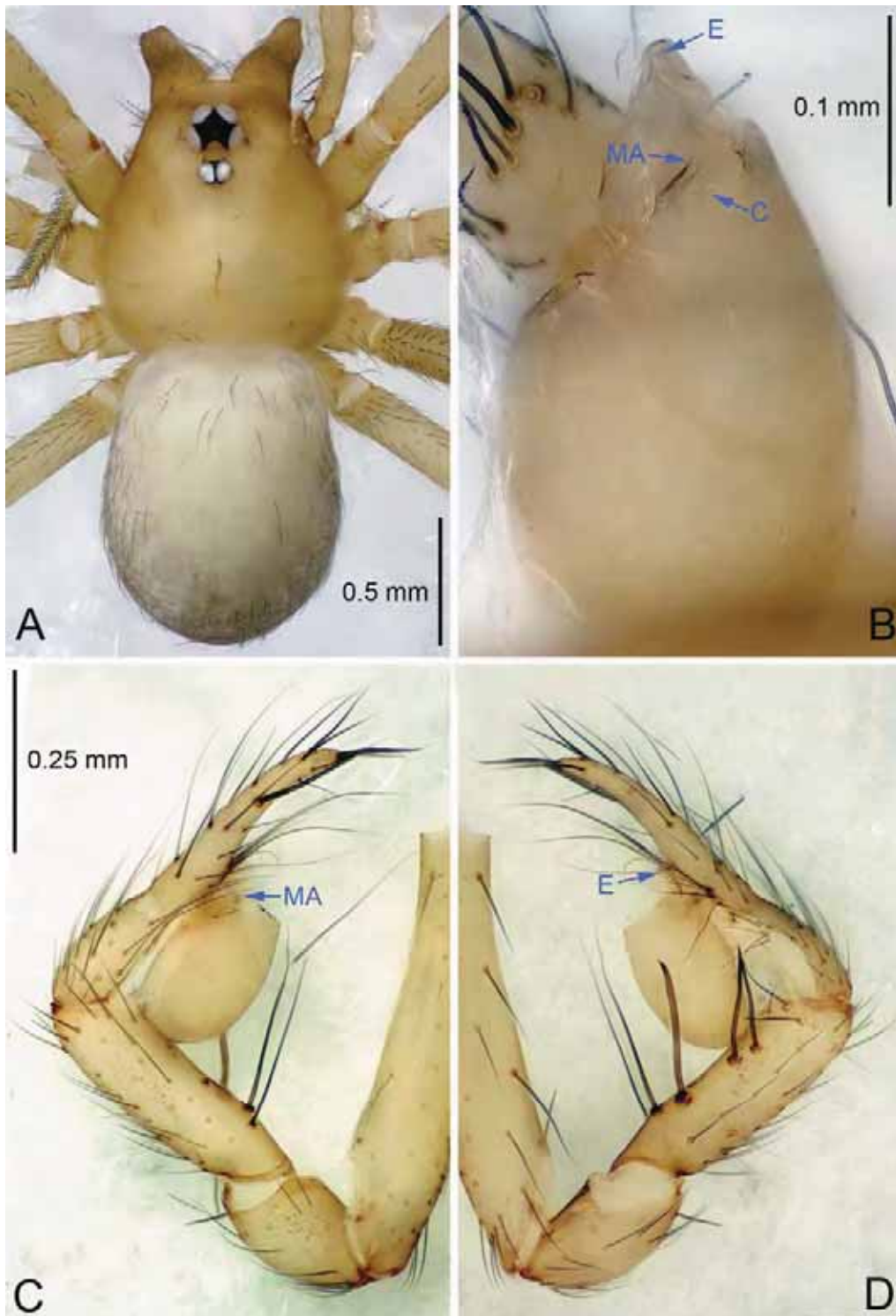
**Type material. Holotype:** male (IZCAS), Chenja Cave, 28.38°N, 108.67°E, Tianba, Songtao County, Tongren City, Guizhou Province, China, 9 Mar 2013, H. Zhao & J. Liu leg. **Paratypes:** 1 male and 2 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. anshun* Lin & Li, 2010, *L. suae* Lin & Li, 2010, *L. tongzi* Lin & Li, 2010, *L. meitan* Lin & Li, 2010, *L. liangfeng* Wang & Li sp. nov., and *L. sanyan* Wang & Li sp. nov., but can be distinguished by the male pedipalpal tibial I spine far apart from other 4 spines (Fig. 12D), conductor reduced (Fig. 12B) (I tibial spine bifurcated symmetrically in *L. anshun*; conductor tip bifurcate in *L. anshun*, bamboo leaf-shaped in *L. sanyan* Wang & Li sp. nov., and *L. tongzi*; thin, triangular in *L. suae* and *L. meitan*, and C tile-shaped in *L. liangfeng* Wang & Li sp. nov.); is also similar to *L. huoyan* Wang & Li sp. nov., but can be distinguished by the median apophysis absent, conductor reduced (Fig. 12B) (median apophysis present, slightly sclerotized, index finger like, conductor broad, semicircular in *L. huoyan* Wang & Li sp. nov.).

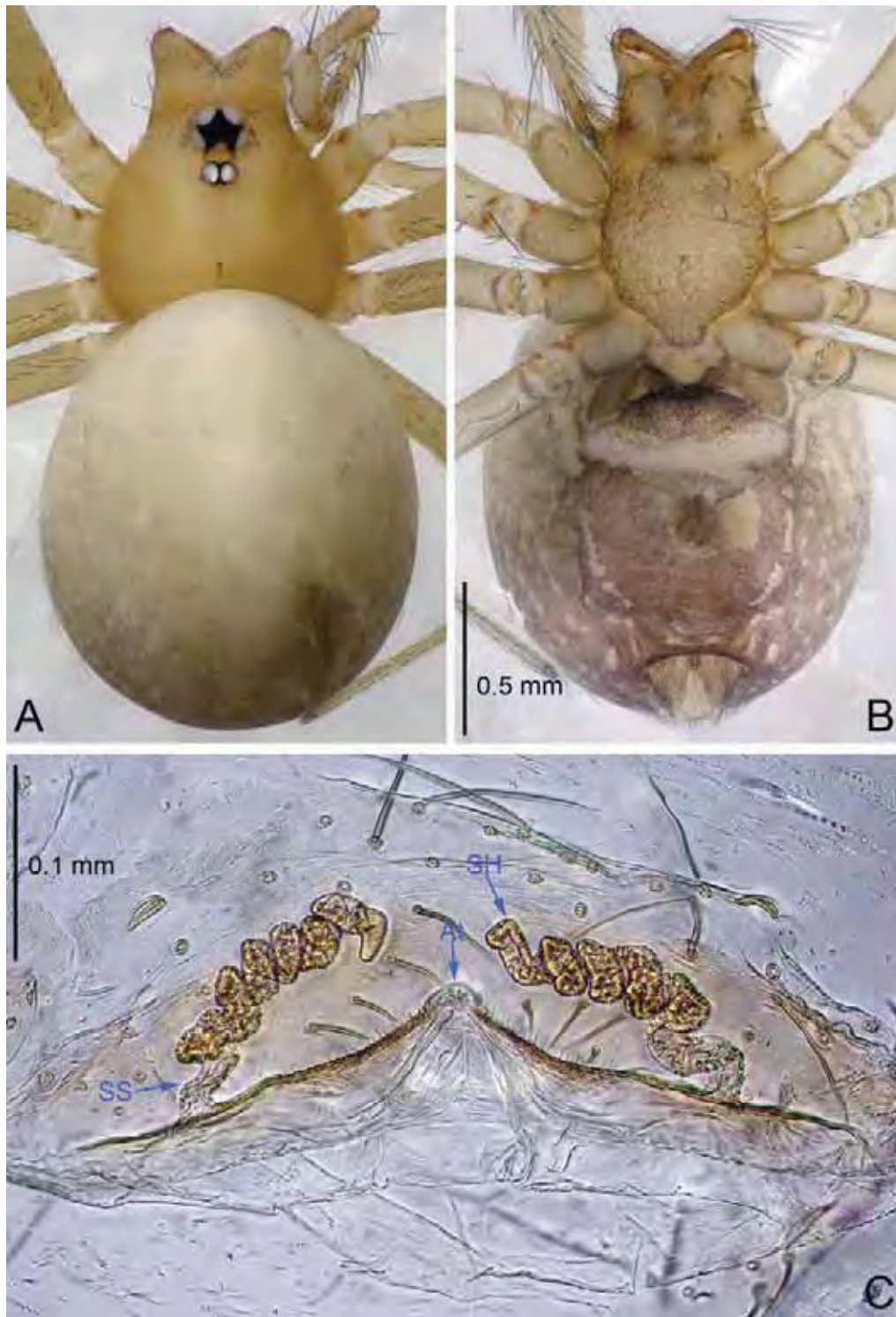
**Description. Male (holotype).** Total length 2.50 (Fig. 12A). Carapace 1.25 long, 0.95 wide. Opisthosoma 1.25 long, 0.88 wide. Carapace yellow. Ocular area with a pair of setae, six eyes. Median groove needle-shaped, cervical grooves and radial furrows distinct. Clypeus 0.15 high. Opisthosoma pale brown, ovoid, with pigmented stripe. Leg measurements: I 10.44 (2.60, 0.37, 3.05, 2.50, 1.62); II 7.84 (2.25, 0.35, 2.25, 1.87, 1.12); III 6.41 (1.50, 0.32, 1.87, 1.62, 1.10); IV 8.59 (2.50, 0.35, 2.37, 2.12, 1.25). Male pedipalp (Figs 12C–D): tibia with 3 long spines prolaterally, 5 spines retrolaterally, with I spine longest, far apart from others. Cymbium not wrinkled. Embolus triangular, prolateral lobe oval. Median apophysis absent. Conductor reduced (Fig. 12B).



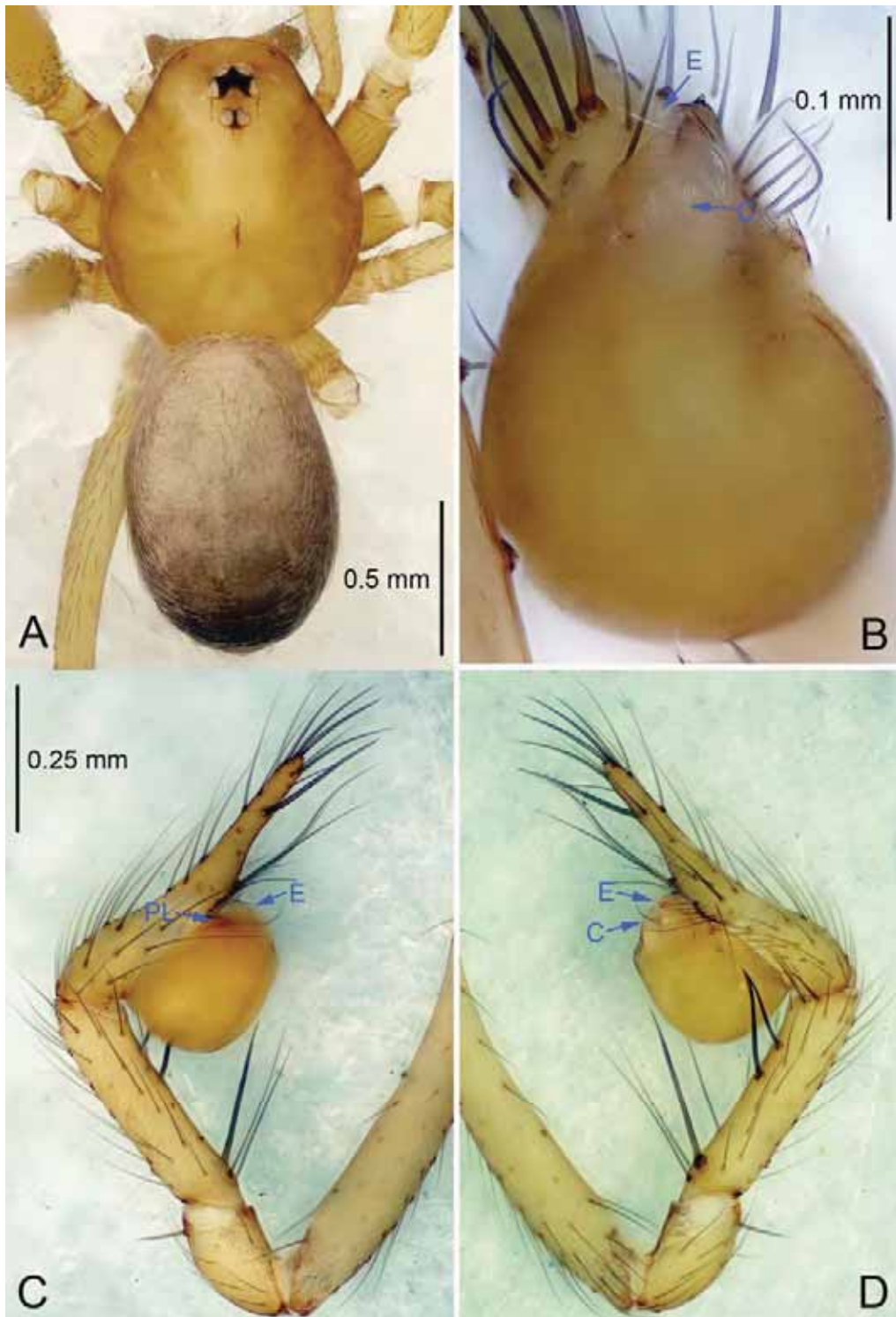


**FIGURE 10** *Leptonetela shuilian* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



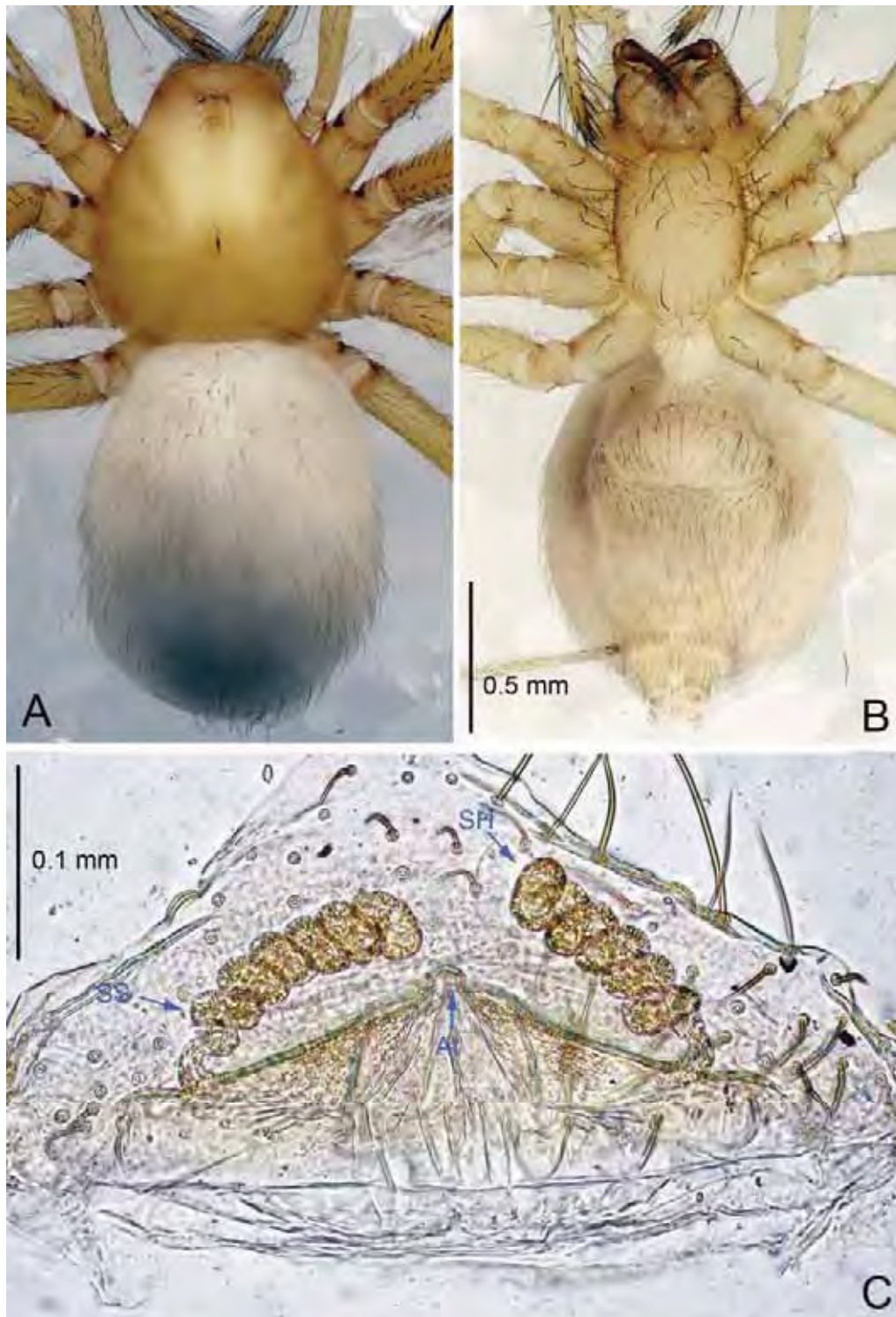
**FIGURE 11** *Leptonetela shuilian* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 12** *Leptonetela chenja* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





**FIGURE 13** *Leptonetela chenja* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

**Female (one of the paratypes).** Similar to male in color and general features, but smaller and with shorter legs. Total length 2.25 (Figs 13A–B). Carapace 0.87 long, 0.80 wide. Opisthosoma 1.37 long, 1.12 wide. Clypeus 0.12 high. Leg measurements: I 7.89 (2.12, 0.37, 2.25, 1.85, 1.30); II 6.19 (1.62, 0.32, 1.75, 1.40, 1.10); III 5.10 (1.45, 0.30, 1.25, 1.20, 0.90); IV 6.76 (1.80, 0.35, 1.87, 1.62, 1.12). Vulva (Fig. 13C): spermathecae coiled, apical part coiled, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela liangfeng* Wang & Li sp. nov.**  
Figs 14–15, 97

**Type material. Holotype:** male (IZCAS), Liangfeng Cave, 28.32°N, 107.84°E, Tian, Lefeng Town, Wuchuan County, Zunyi City, Guizhou Province, China, 7 August 2012, H. Zhao leg. **Paratypes:** 1 male and 2 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. anshun* Lin & Li, 2010, *L. suae* Lin & Li, 2010, *L. tongzi* Lin & Li, 2010, *L. meitan* Lin & Li, 2010, *L. chenjia* Wang & Li sp. nov., and *L. sanyan* Wang & Li sp. nov., but can be distinguished by on the male pedipalpal bulb conductor C tile-shaped (Fig. 14B) (conductor tip bifurcated in *L. anshun*, bamboo leaf-shaped in *L. sanyan* Wang & Li sp. nov., and *L. Tongzi*; thin, triangular in *L. suae* and *L. meitan*, reduced in *L. chenjia* Wang & Li sp. nov.); from *L. anshun* by the tibial I spine slender without bifurcates (Fig. 14D) (tibial I spine symmetrically bifurcated in *L. anshun*).

**Description. Male (holotype).** Total length 2.28 (Fig. 14A). Carapace 0.93 long, 0.88 wide. Opisthosoma 1.35 long, 0.88 wide. Carapace yellow. Eye absent. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma yellowish, ovoid. Leg measurements: I 9.47 (2.59, 0.43, 2.88, 2.25, 1.32); II 8.61 (2.23, 0.32, 2.60, 2.05, 1.41); III 7.38 (2.05, 0.43, 2.08, 1.55, 1.27); IV 8.81 (2.51, 0.38, 2.17, 2.28, 1.47). Male pedipalp (Figs 14C–D): tibia with 4 long setae prolaterally and 5 spines retrolaterally, I spine longest. Cymbium constricted medially, attaching an earlobe-shaped process. Embolus triangular, prolateral lobe oval. Median apophysis absent. Conductor C tile-shaped in ventral view (Fig. 14B).

**Female (one of the paratypes).** Similar to male in color and general features, but smaller and with shorter legs. Total length 2.14 (Figs 15A–B). Carapace 0.88 long, 0.73 wide. Opisthosoma 1.36 long, 0.95 wide. Clypeus 0.13 high. Leg measurements: I 7.44 (1.98, 0.38, 2.03, 1.77, 1.28); II 7.01 (1.88, 0.37, 1.98, 1.55, 1.23); III 5.78 (1.33, 0.25, 1.75, 1.42, 1.03); IV 7.59 (2.03, 0.33, 2.18, 1.79, 1.26). Vulva (Fig. 15C): spermathecae coiled, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela sanyan* Wang & Li sp. nov.**  
Figs 16–17, 97

**Type material. Holotype:** male (IZCAS), Sanyan Cave, 29.15°N, 107.60°E, Heyi, Yangxi Town, Daozhen County, Guizhou Province, China, 30 May 2011, Z. Zha leg. **Paratypes:** 1 male and 2 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. anshun* Lin & Li, 2010, *L. suae* Lin & Li, 2010, *L. tongzi* Lin & Li, 2010, *L. meitan* Lin & Li, 2010, *L. chenjia* Wang & Li sp. nov., and *L. liangfeng* Wang & Li sp. nov., but can be separated from all above except *L. tongzi* by in the male conductor C tile-shaped in this new species (Fig. 16B) (conductor tip bifurcated in *L. anshun*, C tile-shaped in *L. liangfeng* Wang & Li sp. nov., thin, triangular in *L. suae* and *L. meitan*, reduced in *L. chenjia* Wang & Li sp. nov.); from *L. tongzi* by in the female atrium triangular, anterior margin of the atrium wavy line-shaped (Fig. 17C) (atrium fusiform, anterior margin of the atrium with mastoid process medially in *L. tongzi*).

**Description. Male (holotype).** Total length 1.78 (Fig. 16A). Carapace 0.83 long, 0.83 wide. Opisthosoma 1.00 long, 0.75 wide. Carapace yellowish. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, pale brown. Cervical grooves and radial furrows indistinct. Clypeus 0.13 high, slightly sloped anteriorly. Opisthosoma yellow, ovoid, with pigmented stripe. Leg measurements: I 7.08 (2.00, 0.33, 2.15, 1.75, 1.15); II 6.09 (1.68, 0.30, 1.73, 1.38, 1.00); III 4.84 (1.38, 0.28, 1.25, 1.13, 0.80); IV 6.28 (1.75, 0.30, 1.78, 1.50, 0.95). Male pedipalp (Figs 16C–D): tibia with 1 long spine prolaterally, 5 spines retrolaterally, with the basal spine longest. Cymbium constricted medially, attaching an earlobe-shaped process. Embolus triangular, prolateral lobe absent. Median apophysis absent. Conductor bamboo leaf-shaped in ventral view (Fig. 13B).

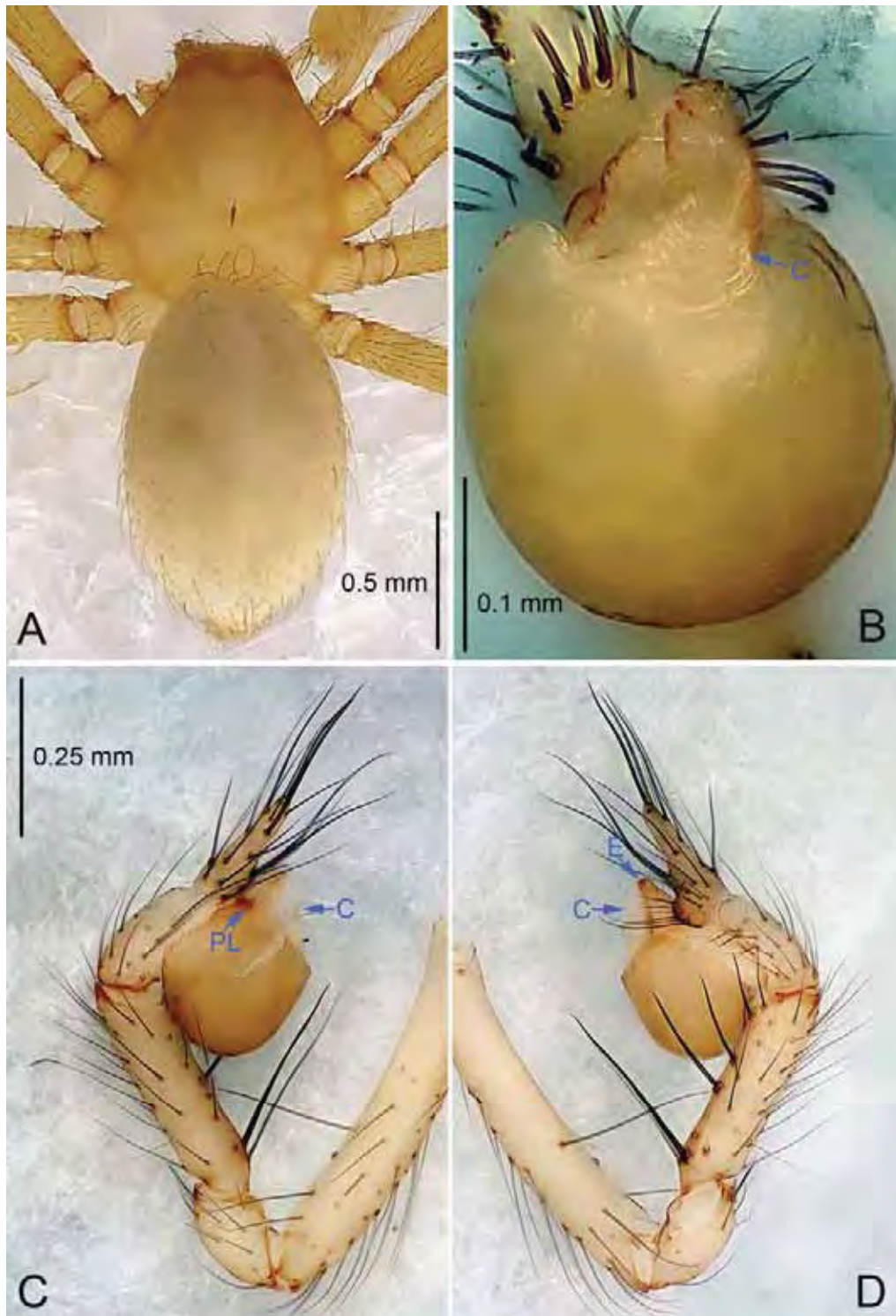
**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.03 (Figs 17A–B). Carapace 0.80 long, 0.75 wide. Opisthosoma 1.25 long, 0.93 wide. Clypeus 0.13 high. Leg measurements: I 6.92 (1.88, 0.33, 2.00, 1.58, 1.13); II 5.36 (1.50, 0.30, 1.53, 1.15, 0.88); III 4.44 (1.20, 0.28, 1.13, 1.05, 0.78); IV 5.94 (1.73, 0.30, 1.58, 1.38, 0.95). Vulva (Fig. 17C): spermathecae coiled, atrium triangular, anterior margin of the atrium wavy line-shaped. Short hairs modified spermathecae, sperm ducts, and anterior margin of atrium.

**Distribution.** China (Guizhou).

***Leptonetela wangjia* Wang & Li sp. nov.**  
Figs 18–19, 94

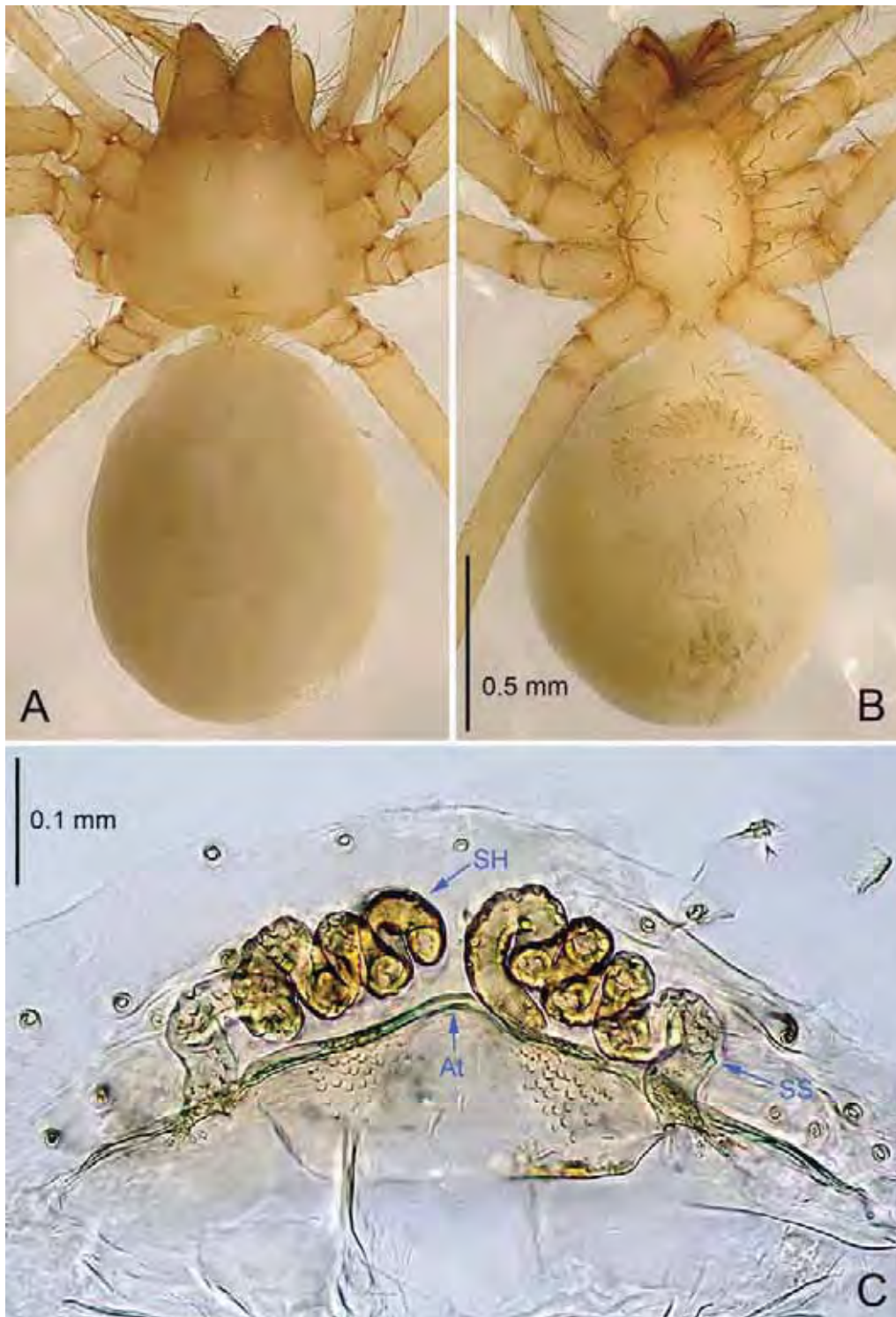
**Type material. Holotype:** male (IZCAS), Wangjia Cave, 26.98°N, 107.94°E, Gaoqi, Nongchang Town, Huangpin County, Guizhou Province, China, 4 March 2012, H. Zhao & J. Liu leg. **Paratype:** 1 female, same data as holotype.



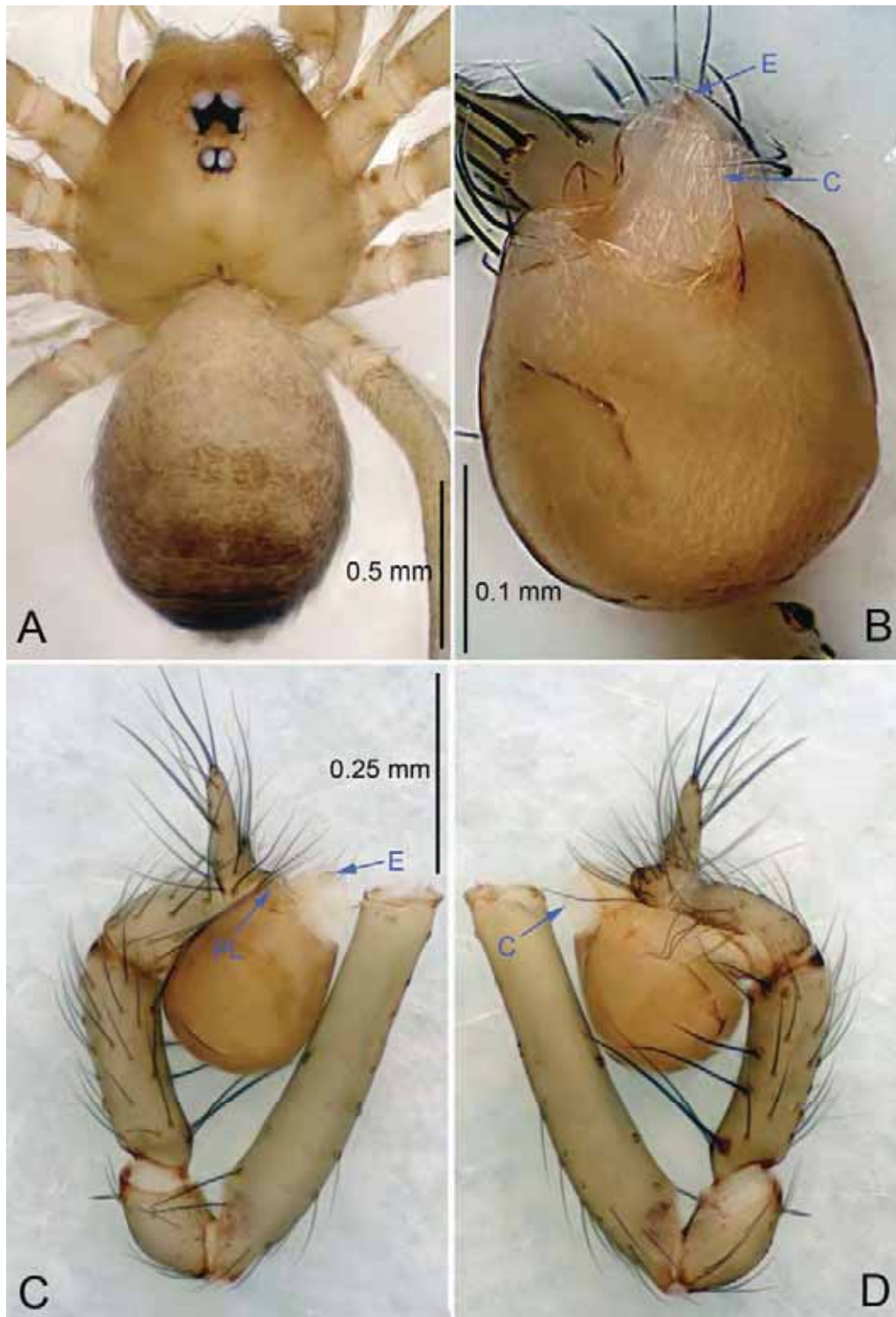


**FIGURE 14** *Leptonetela liangfeng* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





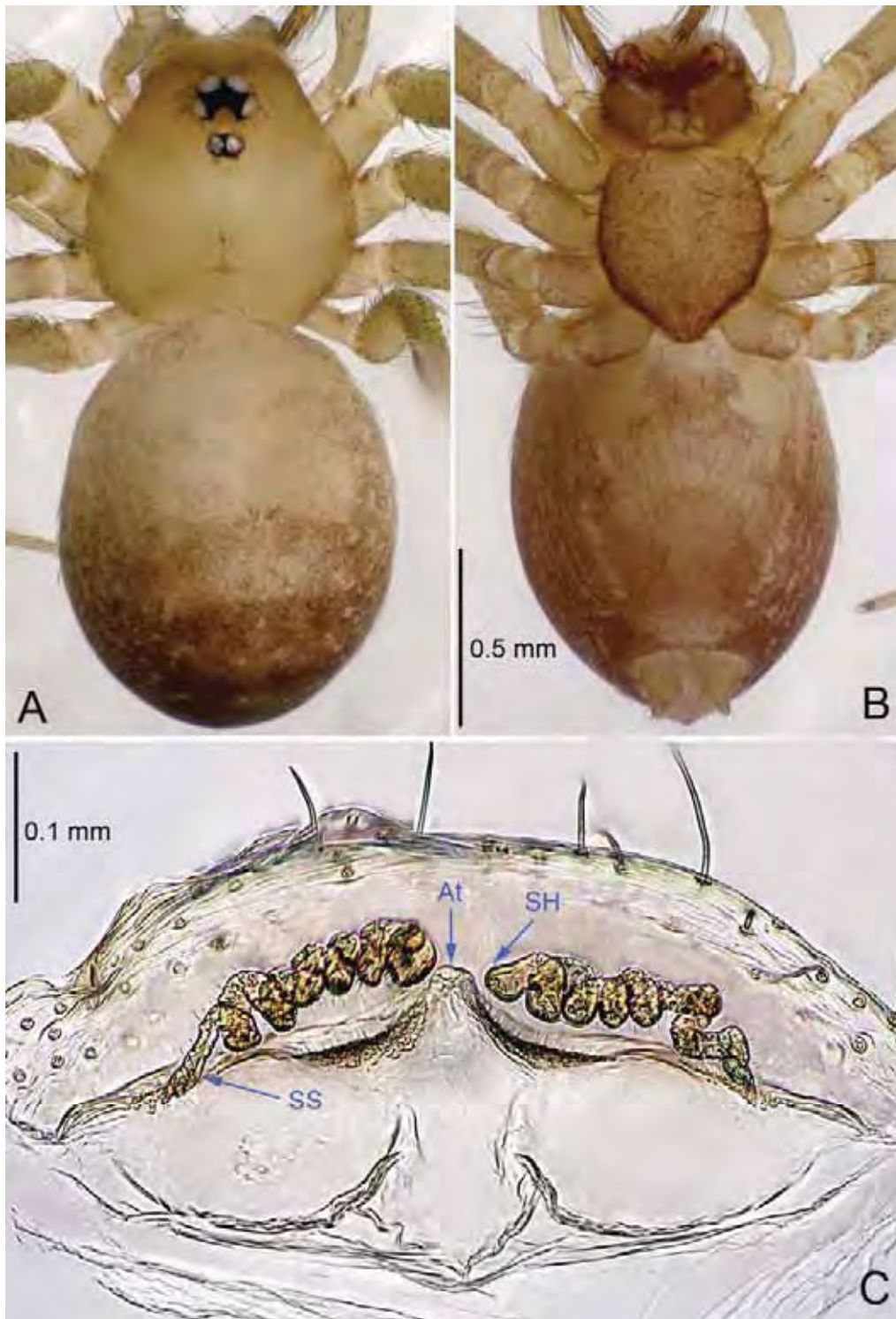
**FIGURE 15** *Leptonetela liangfeng* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 16** *Leptonetela sanyan* sp. nov., holotype male

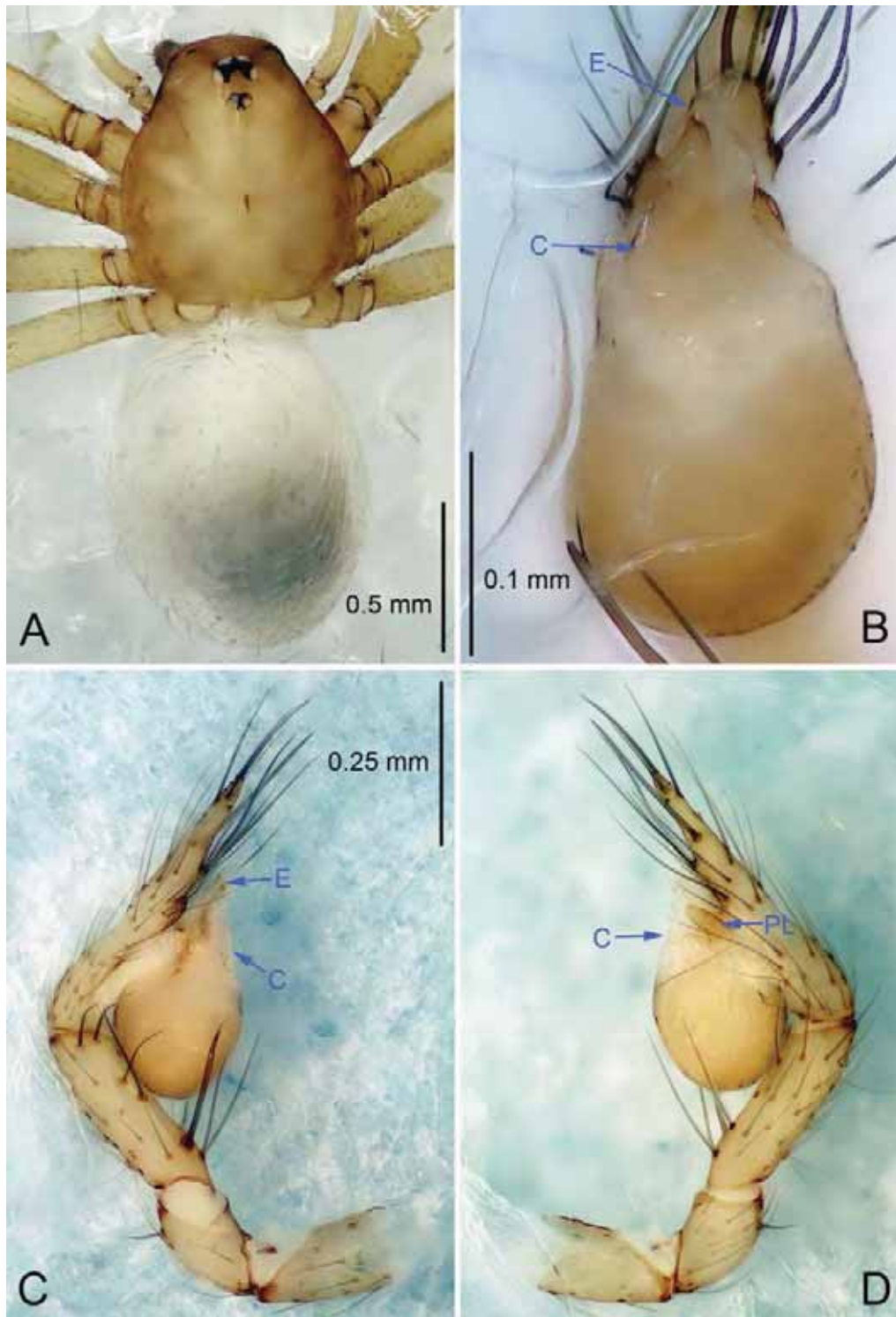
A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





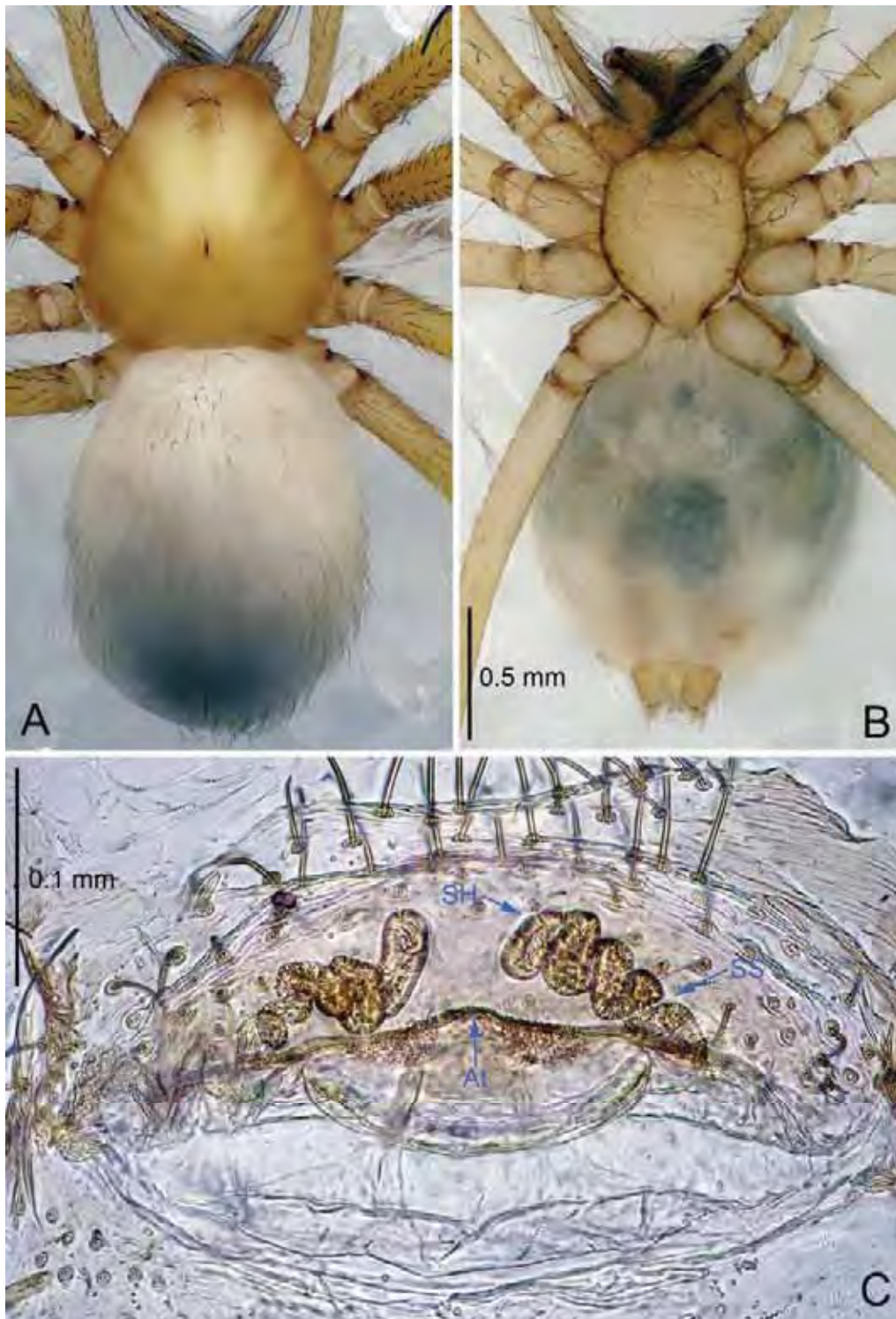
**FIGURE 17** *Leptonetela sanyan* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.





**FIGURE 18** *Leptonetela wangjia* sp. nov., holotype male

A: Habitus, dorsal view; B: Right palpal bulb, ventral view; C: Right palp, retrolateral view; D: Right palp, prolateral view.



**FIGURE 19** *Leptonetela wangjia* sp. nov., one of paratype females  
 A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. danxia* Lin & Li, 2010, and *L. yaoi* Wang & Li, 2011, but can be distinguished by on the male pedipalpal bulb conductor reduced (Fig. 18B) (conductor C tile-shaped in *L. danxia*, bamboo leaf-shaped in *L. yaoi*), from *L. yaoi* by the tibial I spine slender, asymmetrically bifurcated (Fig. 18C) (tibial I spine strong in *L. yaoi*); from *L. danxia* by the cymbium not wrinkled (Figs 18C–D) (cymbium constricted and wrinkled at 1/3 in *L. danxia*).

**Description. Male (holotype).** Total length 2.13 (Fig. 18A). Carapace 0.88 long, 0.80 wide. Opisthosoma 1.00 long, 0.88 wide. Carapace yellow. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, cervical grooves and radial furrows distinct. Clypeus 0.13 high. Opisthosoma gray, ovoid. Leg measurements: I - (1.88, 0.25, -, -, -); II 5.66 (1.63, 0.25, 1.63, 1.25, 0.90); III 4.71 (1.25, 0.23, 1.25, 1.13, 0.85); IV 6.25 (1.75, 0.25, 1.75, 1.50, 1.00). Male pedipalp (Figs 18C–D): tibia with 7 long setae prolaterally and 5 spines retrolaterally, I spine slender, longest, asymmetrically bifurcated. Cymbium not wrinkled, earlobe-shaped process absent. Embolus triangular, prolateral lobe oval. Median apophysis absent. Conductor reduced (Fig. 18B).

**Female.** Similar to male in color and general features, but larger and with longer legs. Total length 2.50 (Figs 19A–B). Carapace 1.00 long, 0.90 wide. Opisthosoma 1.50 long, 1.15 wide. Clypeus 0.20 high. Leg measurements: I 9.26 (2.55, 0.38, 2.60, 2.10, 1.63); II 8.25 (2.37, 0.38, 2.25, 1.90, 1.35); III 6.90 (2.05, 0.35, 1.75, 1.65, 1.10); IV 7.86 (2.30, 0.38, 2.13, 1.75, 1.30). Vulva (Fig. 19C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Guizhou).

***Leptonetela qiangdao* Wang & Li sp. nov.**  
Figs 20–21, 94

**Type material. Holotype:** male (IZCAS), Qiangdao Cave, 25.83°N, 109.04°E, Guandong Town, Congjiang County, Qiandongnan Prefecture, Guizhou, China, 16 March 2013, H. Zhao & J. Liu leg. **Paratypes:** 3 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. furcaspina* Lin & Li, 2010, *L. langdong* Wang & Li sp. nov. and *L. dashui* Wang & Li sp. nov., but can be distinguished by the male pedipalpal tibia I spine strong (Fig. 20D), conductor bamboo leaf-shaped in ventral view (Fig. 20B) (tibia I spine strong, asymmetrically bifurcated, conductor C tile-shaped in *L. furcaspina*, tibial I spine strong, tip curved, conductor reduced in *L. langdong* Wang & Li sp. nov., tibial I spine slender, II III spines curved basally, conductor C tile-shaped in *L. dashui* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 1.80 (Fig. 20A).

Carapace 0.87 long, 0.90 wide. Opisthosoma 0.90 long, 0.75 wide. Carapace yellow. Eyes four, PME absent, ALE and PLE reduced to white points. Median groove needle-shaped, pale brown, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma whitish gray, ovoid, lacking distinctive pattern. Leg measurements: I 7.88 (2.13, 0.33, 2.20, 1.92, 1.30); II 6.41 (1.63, 0.30, 1.75, 1.58, 1.15); III 5.40 (1.50, 0.30, 1.45, 1.23, 0.92); IV 7.43 (1.80, 0.33, 2.10, 1.72, 1.48). Male pedipalp (Figs 20C–D): tibia with 3 long setae prolaterally, 5 spines retrolaterally, with I spine strong, longest, tip curved. Cymbium with no wrinkle medially, earlobe-shaped process small. Bulb with spoon-shaped embolus, prolateral lobe small. Median apophysis absent. Conductor bamboo leaf-shaped in ventral view (Fig. 20B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.25 (Figs 21A–B). Carapace 0.88 long, 0.80 wide. Opisthosoma 1.37 long, 1.13 wide. Clypeus 0.13 high. Leg measurements: I 6.91 (2.10, 0.38, 1.88, 1.47, 1.08); II 6.20 (1.70, 0.35, 1.75, 1.40, 1.00); III 4.97 (1.37, 0.30, 1.25, 1.22, 0.83); IV 6.98 (1.88, 0.38, 1.92, 1.67, 1.13). Vulva (Fig. 21C): spermathecae coiled, atrium trapezoidal, anterior margin of atrium wavy line-shaped, covered with short hairs.

**Distribution.** China (Guizhou).

***Leptonetela langdong* Wang & Li sp. nov.**  
Figs 22–23, 97

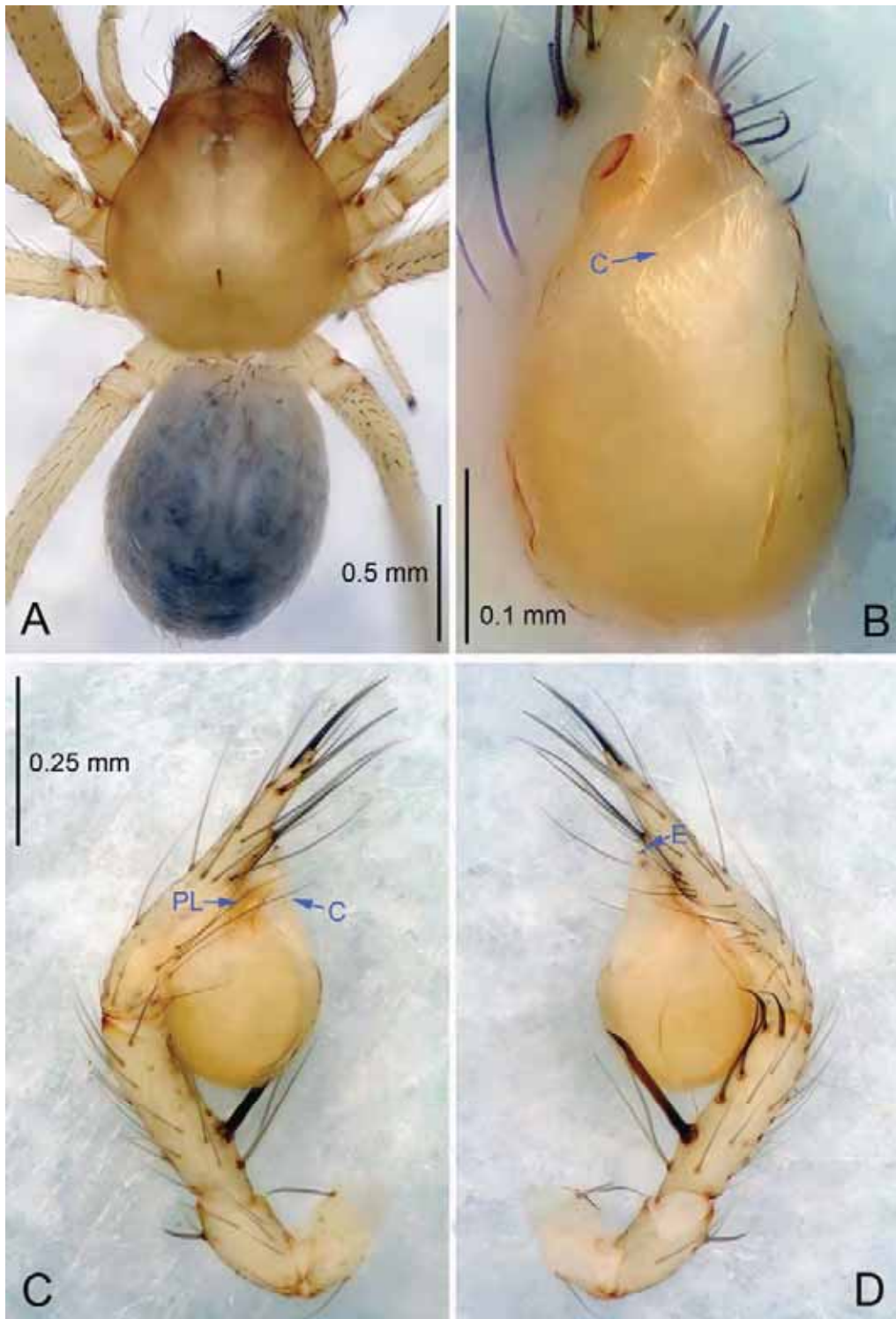
**Type material. Holotype:** male (IZCAS), Menglonggong Cave, 27.07°N, 107.76°E, Langdong Village, Huangping County, Qiandongnan Prefecture, Guizhou Province, China, 3 March 2013, H. Zhao & J. Liu leg. **Paratypes:** 1 male and 2 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. furcaspina* Lin & Li, 2010, *L. qiangdao* Wang & Li sp. nov., and *L. dashui* Wang & Li sp. nov., but can be distinguished by the male pedipalpal tibia I spine strong, tip curved (Fig. 22D), conductor reduced (Fig. 22B) (tibial I spine strong, asymmetrically bifurcated, conductor C tile-shaped in *L. furcaspina*, tibial I spine strong, conductor bamboo leaf-shaped in *L. qiangdao* Wang & Li sp. nov., tibial I spine slender, II III spines curved basally, conductor C tile-shaped in *L. dashui* Wang & Li sp. nov.).

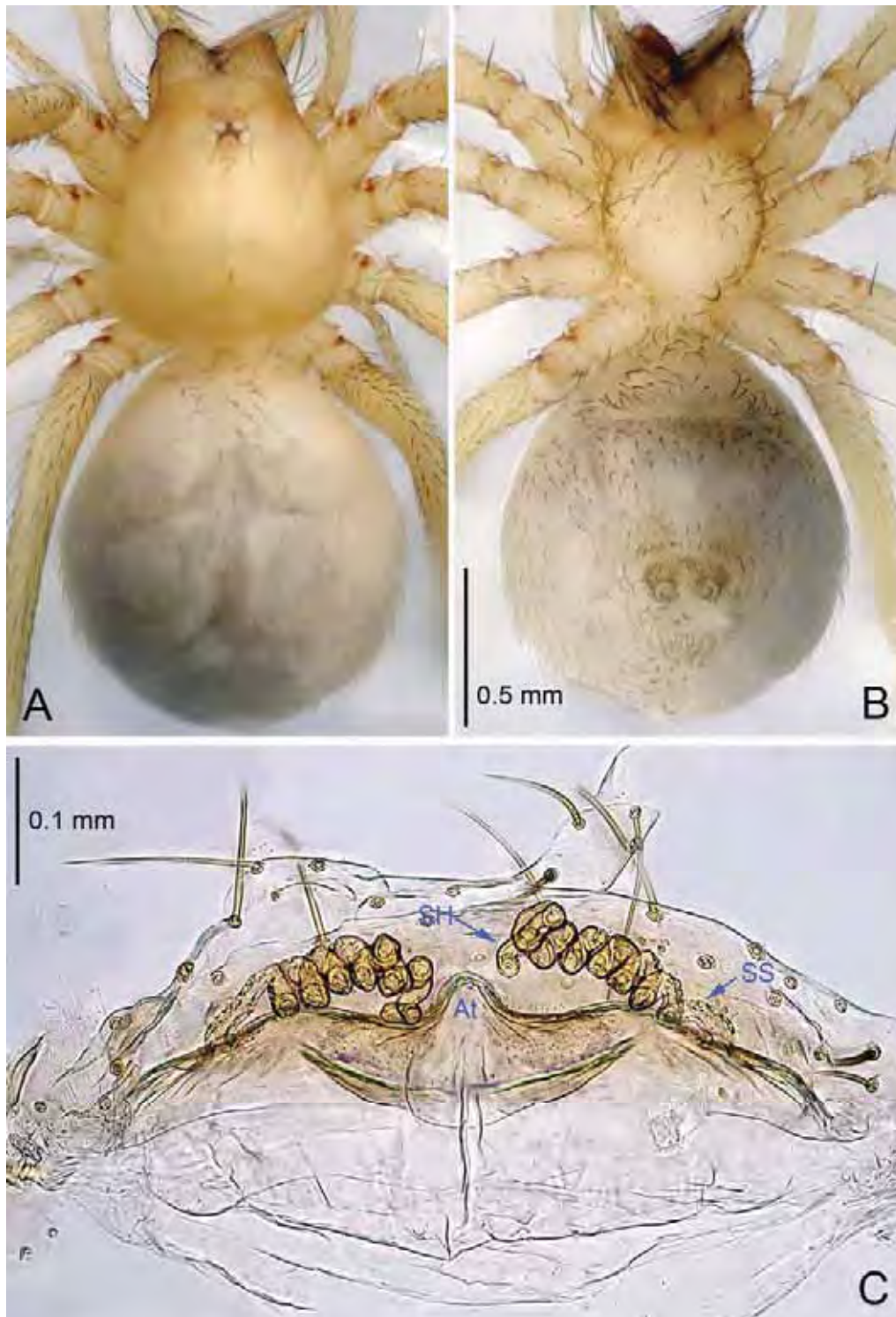
**Description. Male (holotype):** total length 2.25 (Fig. 22A). Carapace 1.25 long, 0.87 wide. Opisthosoma 1.13 long, 0.88 wide. Carapace yellowish. Eyes six. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma gray, ovoid. Leg measurements: I 8.91 (2.38, 0.35, 2.55, 2.13, 1.50); II 7.23 (2.00, 0.35, 1.88, 1.75, 1.25); III 6.22 (1.75, 0.34, 1.63, 1.50, 1.00); IV 8.05 (2.25, 0.35, 2.25, 1.90, 1.30). Male pedipalp (Figs 22C–D): femur with



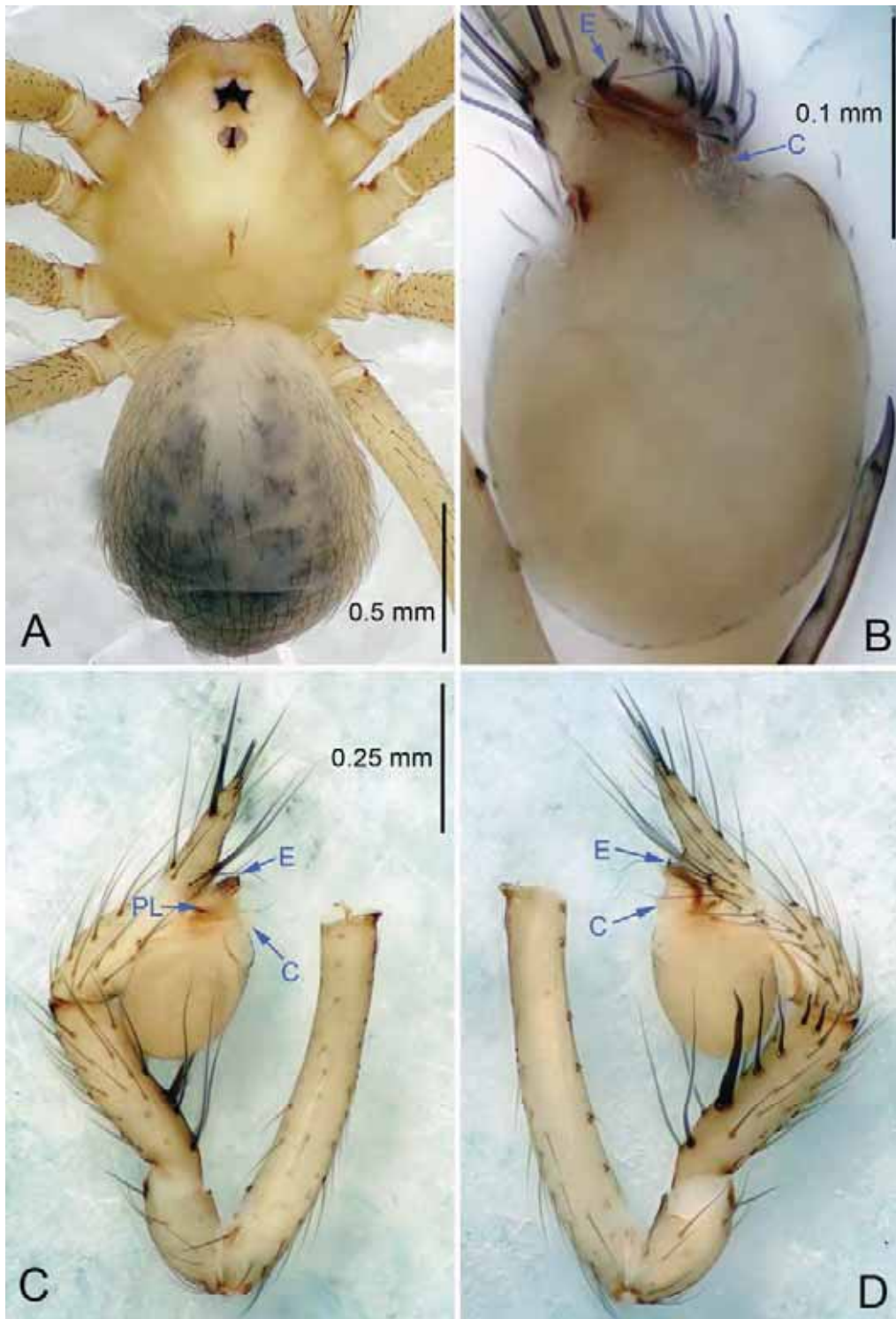


**FIGURE 20** *Leptonetela qiangdao* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



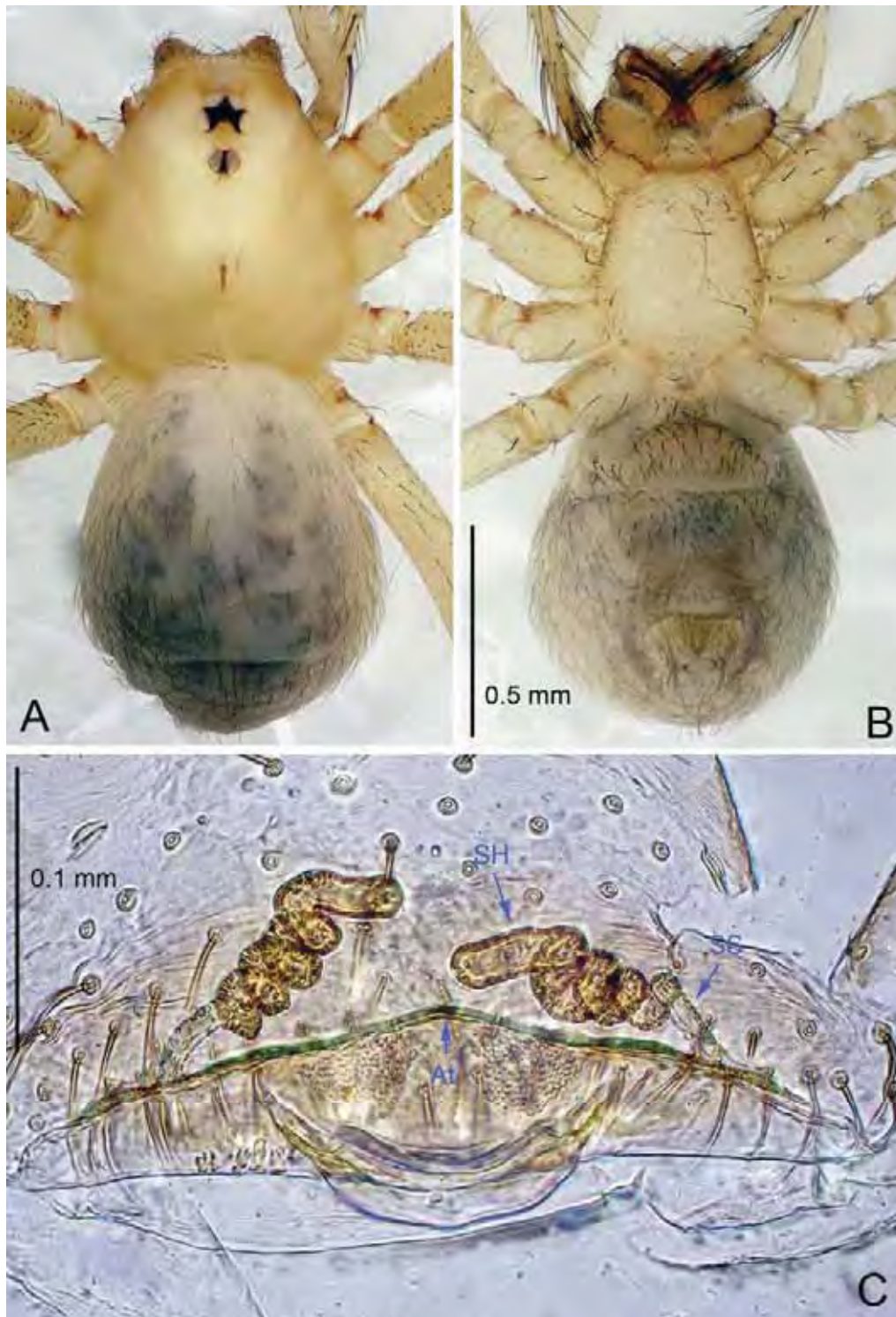
**FIGURE 21** *Leptonetela qiangdao* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 22** *Leptonetela langdong* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





**FIGURE 23** *Leptonetela langdong* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

6 spines ventrally, tibia with 3 long spines prolaterally, 1 long seta and 5 spines retrolaterally, with I spine strong, tip curved. Cymbium constricted medially, attaching an earlobe-shaped process. Embolus triangular, bearing a tooth basally, prolateral lobe reduced. Median apophysis absent. Conductor reduced (Fig. 22B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.25 (Figs 23A–B). Carapace 1.10 long, 0.60 wide. Opisthosoma 1.25 long, 0.88 wide. Clypeus 0.15 high. Leg measurements: I 7.48 (2.10, 0.38, 2.13, 1.62, 1.25); II 6.14 (1.75, 0.38, 1.63, 1.38, 1.00); III 5.18 (1.50, 0.35, 1.25, 1.20, 0.88); IV 6.86 (2.00, 0.38, 1.88, 1.50, 1.10). Vulva (Fig. 23C): spermathecae coiled, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela dashui* Wang & Li sp. nov.**  
**Figs 24–25, 94**

**Type material. Holotype:** male (IZCAS), Dashui Cave, 26.61°N, 106.61°E, Shijicheng, Jinyang New Urban Area, Gui Yang City, Guizhou Province, China, 18 June 2011, Z. Zha leg. **Paratypes:** 1 male and 2 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. furcaspina* Lin & Li, 2010, *L. qiango* Wang & Li sp. nov., and *L. langdong* Wang & Li sp. nov., but can be distinguished by the male pedipalpal tibial I spine slender, II III spines curved basally (Fig. 24D), conductor C tile-shaped (Fig. 24B), (tibial I spine strong, tip curved, conductor reduced in *L. langdong* Wang & Li sp. nov., tibial I spine strong, asymmetrically bifurcated, conductor narrow and bifurcated in *L. furcaspina*, tibial I spine strong, conductor bamboo leaf-shaped in *L. qiango* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 1.88 (Fig. 24A). Carapace 0.88 long, 0.75 wide. Opisthosoma 1.00 long, 0.75 wide. Carapace yellowish. Eyes absent. Median groove, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma gray, ovoid. Leg measurements: I 8.24 (2.25, 0.38, 2.43, 1.88, 1.30); II 7.16 (1.98, 0.35, 2.00, 1.63, 1.20); III 6.06 (1.75, 0.33, 1.60, 1.50, 0.88); IV 7.69 (2.13, 0.38, 2.08, 1.85, 1.25). Male pedipalp (Figs 24C–D): femur with 4 spines ventrally, tibia with 2 long setae prolaterally, 2 long setae and 5 slender spines retrolaterally, the spines equally strong, I spine longest. Cymbium not wrinkled, earlobe-shaped process small. Embolus triangular, prolateral lobe reduced. Median apophysis absent. Conductor C tile-shaped in ventral view (Fig. 24B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 1.93 (Figs 25A–B). Carapace 0.78 long, 0.75 wide. Opisthosoma 1.18 long, 1.00 wide. Clypeus 0.15 high. Leg measurements: I 6.02 (1.68, 0.28, 1.73, 1.30, 1.03); II 5.29 (1.45, 0.28, 1.43, 1.25,

0.88); III 4.34 (1.25, 0.25, 1.13, 1.03, 0.68); IV 5.67 (1.63, 0.28, 1.58, 1.28, 0.90). Vulva (Fig. 25C): spermathecae coiled, atrium fusiformed, anterior margin with mastoid process medially.

**Distribution.** China (Guizhou).

***Leptonetela gang* Wang & Li sp. nov.**  
**Figs 26–27, 94**

**Type material. Holotype:** male (IZCAS), Gang Cave, 26.87°N, 108.91°E, Tunhou, Nanming Town, Jianhe County, Kaili City, Guizhou Province, China, 15 December 2011, Z. Zha leg. **Paratypes:** 15 males and 6 females, same data as holotype; 4 males and 5 females, Long Cave, 26.85°N, 108.79°E, Longtang, Liangshang Town, Sansui County, Kaili City, Guizhou Province, China, 18 December 2011, Z. Zha leg; 5 males and 5 females, Shenxian Cave, 26.87°N, 108.89°E, Shixing, Xiaolan Country, Nanming Town, Jianhe County, Kaili City, Guizhou Province, China, 16 December 2011, Z. Zha leg; 5 females, Niu Cave, 26.86°N, 108.93°E, Cenge, Nanming Town, Jianhe County, Kaili City, Guizhou Province, China, 14 December 2011, Z. Zha leg.

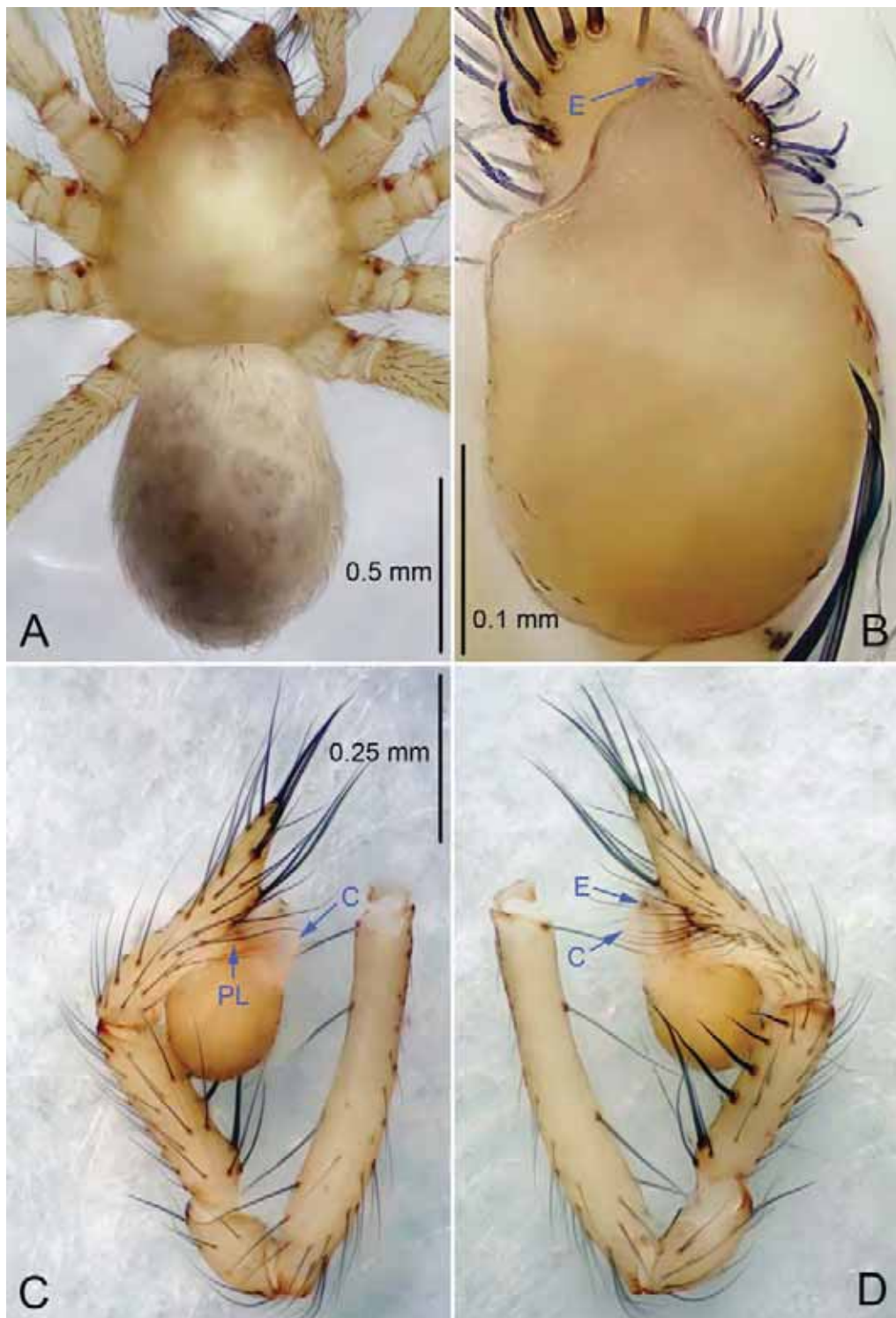
**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. jiulong* Lin & Li, 2010, but can be distinguished by the male pedipalpal tibia with 6 spines retrolaterally, II spine thickest, I, II spines equally length, II spine asymmetrically bifurcated (Fig. 26D), median apophysis absent, conductor reduced (Fig. 26B) (I, II spines equally strong, II spine longest and bifurcate, I spine half the length of II, median apophysis broad and smooth, conductor rugose, triangular in *L. jiulong*).

**Description. Male (holotype).** Total length 2.63 (Fig. 26A). Carapace 1.25 long, 1.00 wide. Opisthosoma 1.50 long, 1.13 wide. Carapace yellow. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, cervical grooves and radial furrows distinct. Clypeus 0.13 high. Opisthosoma gray, ovoid. Leg measurements: I 10.66 (3.00, 0.38, 3.13, 2.55, 1.60); II 8.96 (2.50, 0.38, 2.55, 2.13, 1.40); III 7.55 (2.25, 0.35, 2.00, 1.75, 1.20); IV 9.68 (2.75, 0.38, 2.75, 2.35, 1.45). Male pedipalp (Figs 26C–D): tibia with 5 long spines prolaterally, 6 spines retrolaterally, II spine thickest asymmetrically bifurcated, I II spine equally length. Cymbium constricted medially, attaching an earlobe-shaped process. Embolus triangular, median apophysis absent, conductor reduced (Fig. 26B).

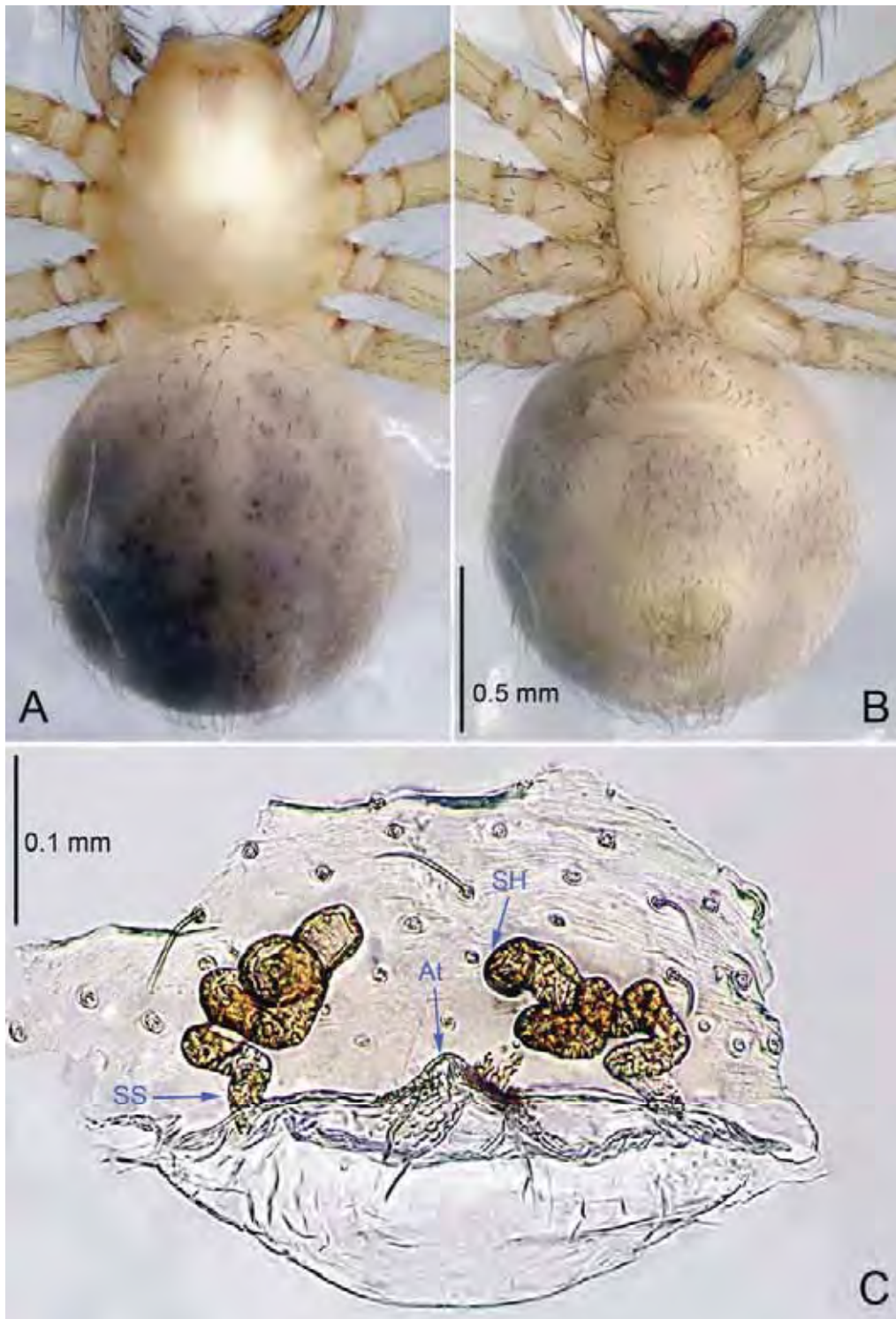
**Female (one of the paratypes).** Similar to male in color and general features, but smaller and with shorter legs. Total length 2.38 (Figs 27A–B). Carapace 1.00 long, 0.88 wide. Opisthosoma 1.50 long, 1.20 wide. Clypeus 0.13 high. Leg measurements: I 9.26 (2.50, 0.38, 2.75, 2.13, 1.50); II 7.51 (2.00, 0.38, 2.13, 1.75, 1.25); III 6.29 (1.88, 0.38, 1.63, 1.40, 1.00); IV 8.11 (2.25, 0.38, 2.25, 1.88, 1.35). Vulva (Fig. 27C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Guizhou).

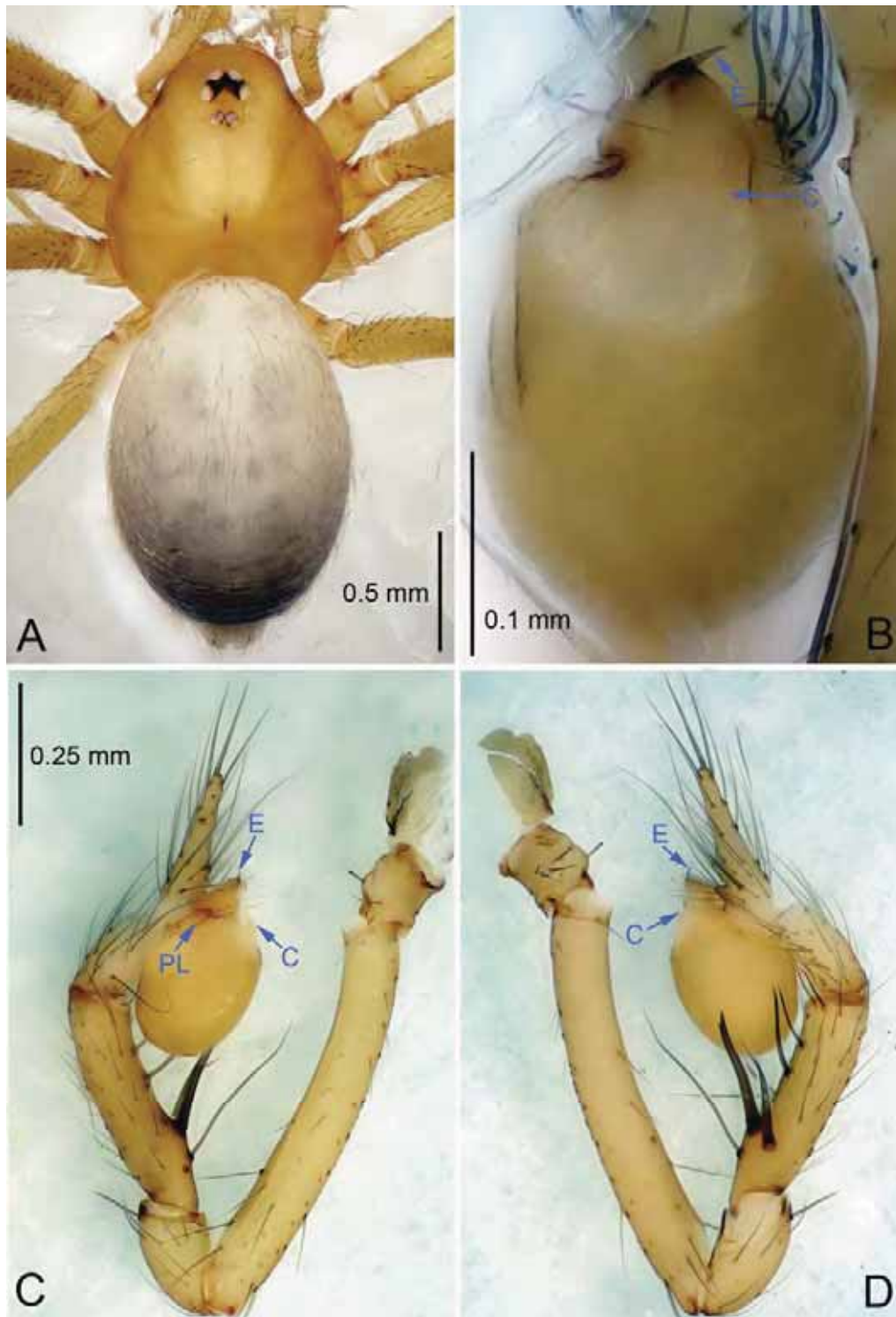


**FIGURE 24** *Leptonetela dashui* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





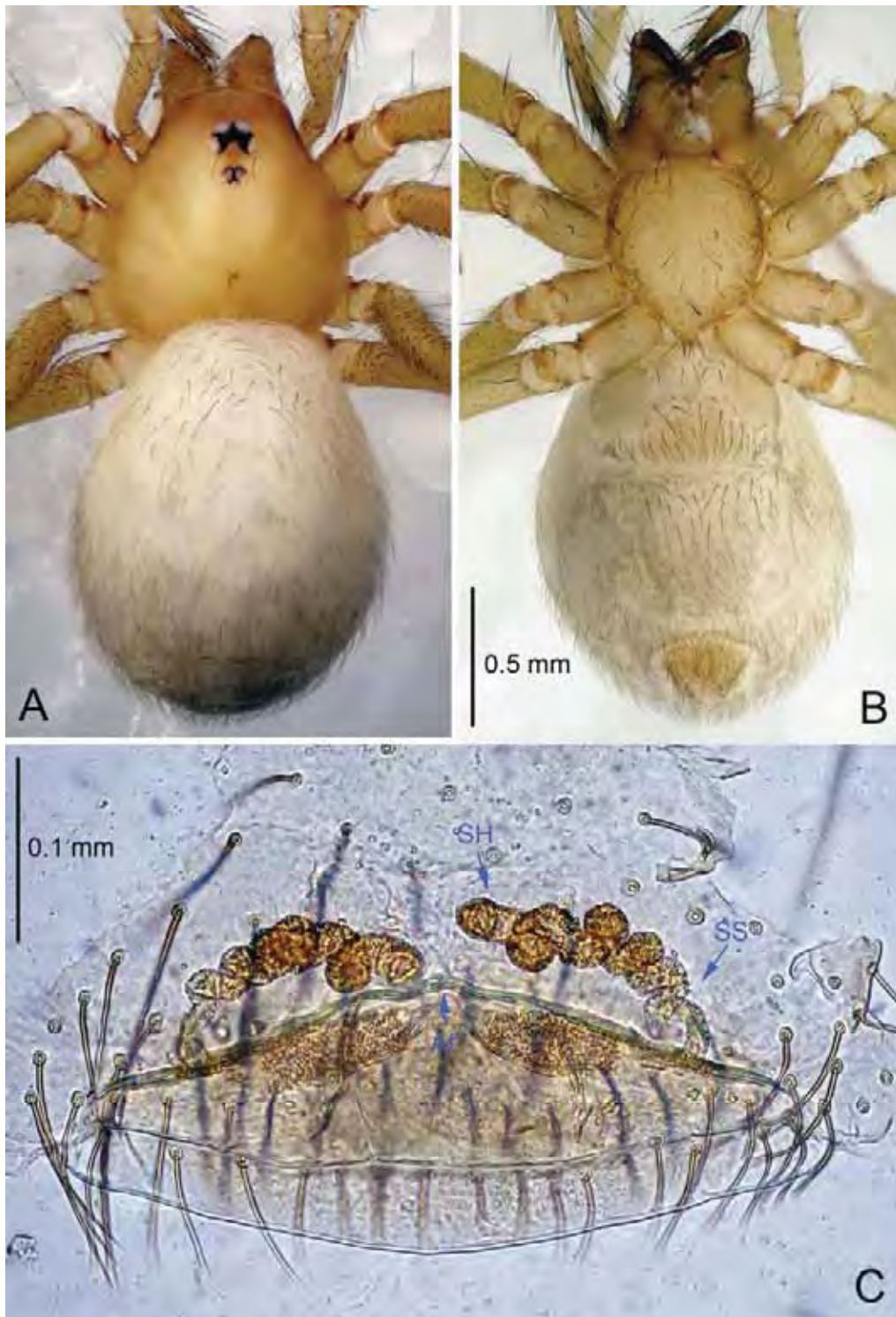
**FIGURE 25** *Leptonetela dashui* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 26** *Leptonetela gang* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolatateral view; D: Palp, retrolateral view.





**FIGURE 27** *Leptonetela gang* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



***Leptonetela la* Wang & Li sp. nov.**  
**Figs 28–29, 94**

**Type material. Holotype:** male (IZCAS), Xiaoyakoula Cave, 25.80°N, 104.95°E, Puan County, Qianxinan Prefecture, Guizhou Province, China, 14 July 2012, H. Zhao leg. **Paratypes:** 3 males and 5 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. rudong* Wang & Li sp. nov., and *L. wenzhu* Wang & Li sp. nov. but can be distinguished from *L. wenzhu* Wang & Li sp. nov. by the male pedipalpal tibia with 7 spines retrolaterally (tibia with 6 spines retrolaterally in *L. wenzhu* Wang & Li sp. nov.); from *L. rudong* Wang & Li sp. nov. by the tibia with 4 long setae prolaterally (Fig. 28D) (tibia with 2 long setae, 2 spines prolaterally, cymbium with 1 ox horn-shaped spine on the earlobe-shaped process in *L. rudong* Wang & Li sp. nov.); from *L. rudong* Wang & Li sp. nov., and *L. wenzhu* Wang & Li sp. nov. by the conductor broad, C tile-shaped (conductor thin, triangular in *L. rudong* Wang & Li sp. nov., bamboo leaf-shaped in *L. wenzhu* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 2.97 (Fig. 28A). Carapace 1.25 long, 1.09 wide. Opisthosoma 1.71 long, 1.40 wide. Carapace yellow. Ocular area with a pair of setae, eyes absent. Median groove needle-shaped, cervical grooves and radial furrows distinct. Clypeus 0.17 high. Opisthosoma gray, ovoid. Leg measurements: I 10.49 (2.60, 0.40, 3.16, 2.48, 1.85); II 9.70 (2.66, 0.41, 2.81, 2.26, 1.56); III 8.83 (2.34, 0.40, 2.81, 1.97, 1.31); IV 10.17 (2.81, 0.41, 2.88, 2.51, 1.56). Male pedipalp (Figs 28C–D): tibia with 4 long setae prolaterally and 7 slender spines retrolaterally, I II spines equally length, longer than others. Cymbium constricted medially, attaching an earlobe-shaped process. Embolus triangular, prolateral lobe oval. Median apophysis absent. Conductor C tile-shaped in ventral view (Fig. 28B).

**Female (one of the paratypes).** Similar to male in color and general features, but smaller and with shorter legs. Total length 2.81 (Figs 29A–B). Carapace 1.09 long, 1.01 wide. Opisthosoma 1.69 long, 1.47 wide. Clypeus 0.17 high. Leg measurements: I 9.68 (2.56, 0.40, 2.97, 2.13, 1.62); II 8.23 (2.34, 0.34, 2.43, 1.81, 1.31); III 7.03 (2.19, 0.34, 2.03, 1.38, 1.09); IV 9.13 (2.51, 0.34, 2.59, 2.38, 1.31). Vulva (Fig. 29C): spermathecae coiled, atrium fusiformed, anterior margin of atrium with one large mastoid process medially, and covered with short hairs.

**Distribution.** China (Guizhou).

***Leptonetela rudong* Wang & Li sp. nov.**  
**Figs 30–31, 97**

**Type material. Holotype:** male (IZCAS), Rudong Cave, 25.57°N, 110.62°E, Longpan Mountain, Dongtian, Xing'an County, Guilin City, Guangxi Zhuang Autonomous Region, China, 11 July 2009, C. Wang & Z. Yao leg. **Paratypes:** 1 male and 3 females, same

data as holotype; 3 females, Gouya Cave, 25.46°N, 110.11°E, Hufeng, Guanyang County, Guilin City, Guangxi Zhuang Autonomous Region, China, 30 August 2009, C. Wang & Z. Yao leg; 2 females, Jiulong Cave, 25.46°N, 110.09°E, Shifeng, Guanyang County, Guilin City, Guangxi Zhuang Autonomous Region, China, 30 August 2009, C. Wang & Z. Yao leg.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. la* Wang & Li sp. nov., and *L. wenzhu* Wang & Li sp. nov. but can be distinguished by the male pedipalpal tibia with 2 long setae, 2 spines prolaterally, 1 long seta, and 6 spines retrolaterally, cymbium with 1 ox horn-shaped spine on the earlobe-shaped process (Figs 30C–D), conductor thin, triangular in ventral view (Fig. 30B) (tibia with 4 long setae prolaterally, 7 slender spines retrolaterally, conductor broad, C tile-shaped in *L. la* Wang & Li sp. nov.; tibia with 2 long setae prolaterally, 6 spines retrolaterally, with I spine strongest, conductor bamboo leaf-shaped in *L. wenzhu* Wang & Li sp. nov.).

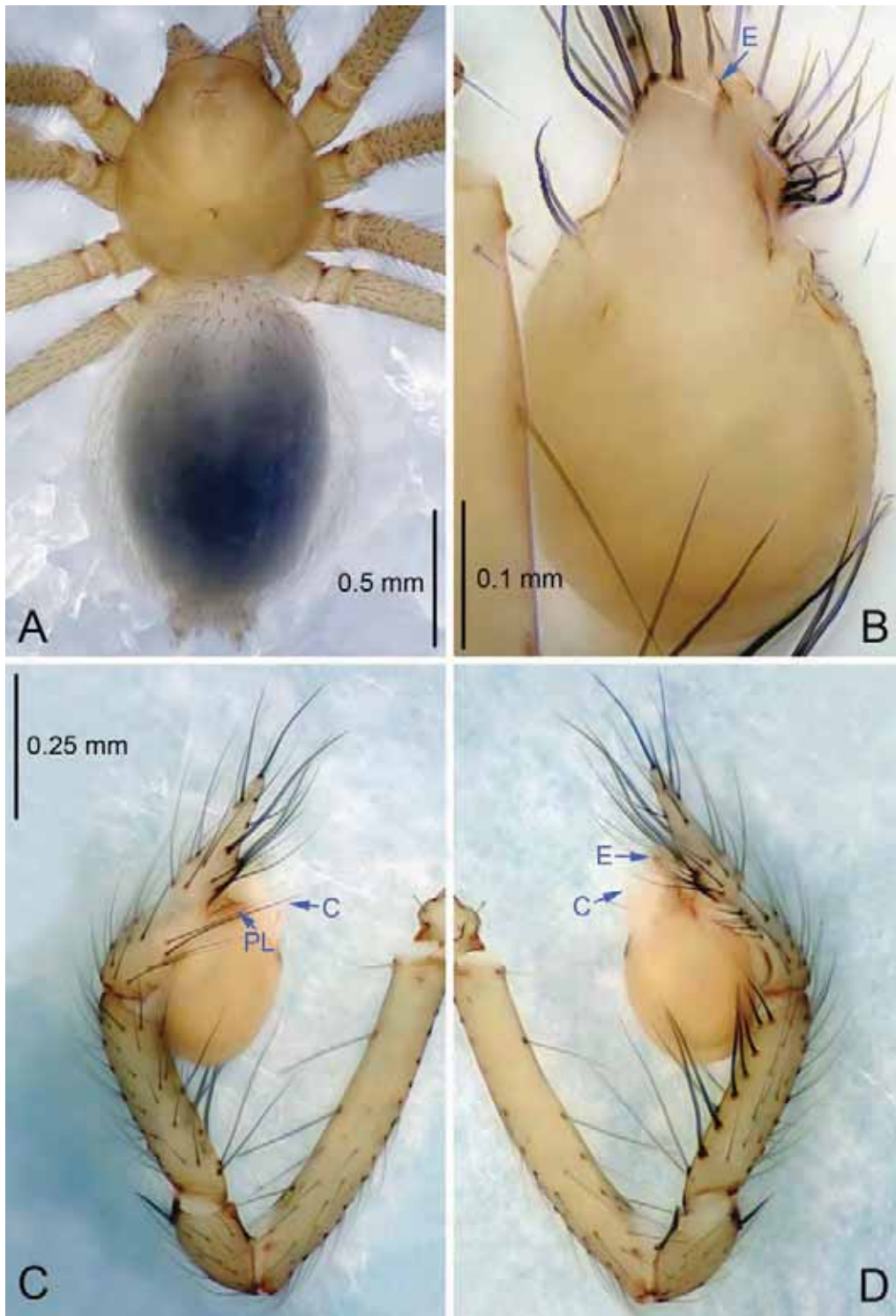
**Description. Male (holotype).** Total length 2.12 (Fig. 30A). Carapace 0.88 long, 0.85 wide. Opisthosoma 1.25 long, 1.05 wide. Carapace yellowish. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma brown, ovoid. Leg measurements: I 10.15 (2.84, 0.38, 3.00, 2.38, 1.55); II 7.84 (2.08, 0.38, 2.23, 1.88, 1.27); III 6.55 (1.83, 0.35, 1.75, 1.62, 1.00); IV 8.31 (2.25, 0.38, 2.38, 2.05, 1.25). Male pedipalp (Figs 30C–D): tibia with 2 long setae, 2 spines prolaterally, 1 long seta and 6 slender spines retrolaterally, with I spine longest. Cymbium constricted medially, with 1 ox horn-shaped spine on the earlobe-shaped process. Embolus triangular, pedipalpal bulb oval. Median apophysis absent. Conductor thin, triangular in ventral view (Fig. 30B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.15 (Figs 31A–B). Carapace 0.90 long, 0.88 wide. Opisthosoma 1.33 long, 1.02 wide. Clypeus 0.13 high. Leg measurements: I 8.64 (2.35, 0.33, 2.55, 1.88, 1.53); II 6.87 (2.03, 0.33, 1.88, 1.50, 1.13); III 6.06 (1.90, 0.33, 1.50, 1.35, 0.98); IV 7.39 (1.98, 0.33, 2.13, 1.78, 1.17). Vulva (Fig. 31C): spermathecae coiled, atrium semicircular, anterior margin of atrium with one mastoid process medially, and covered with short hairs.

***Leptonetela wenzhu* Wang & Li sp. nov.**  
**Figs 32–33, 97**

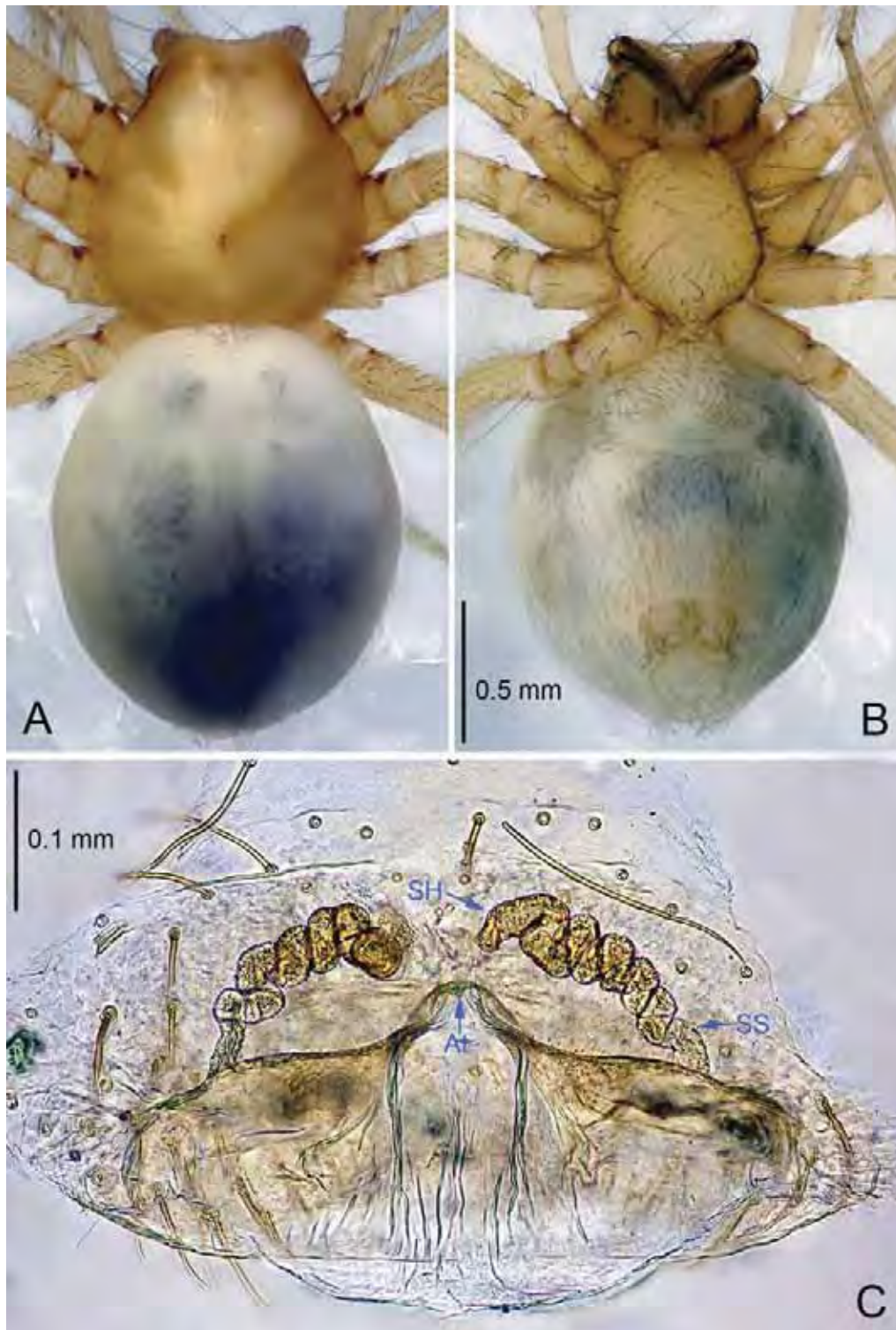
**Type material. Holotype:** male (IZCAS), Wenzhu Cave, 25.44°N, 105.13°E, Longchang Town, Xingren City, Guizhou Province, China, 16 July 2012, H. Zhao leg. **Paratypes:** 1 male and 2 females, same data as holotype; 4 females, Xiaoya Cave, 25.44°N, 105.13°E, Yaqiao Town, Xingren City, Guizhou Province, China, 16 July 2012, H. Zhao leg.

**Etymology.** The specific name refers to the type locality; noun.



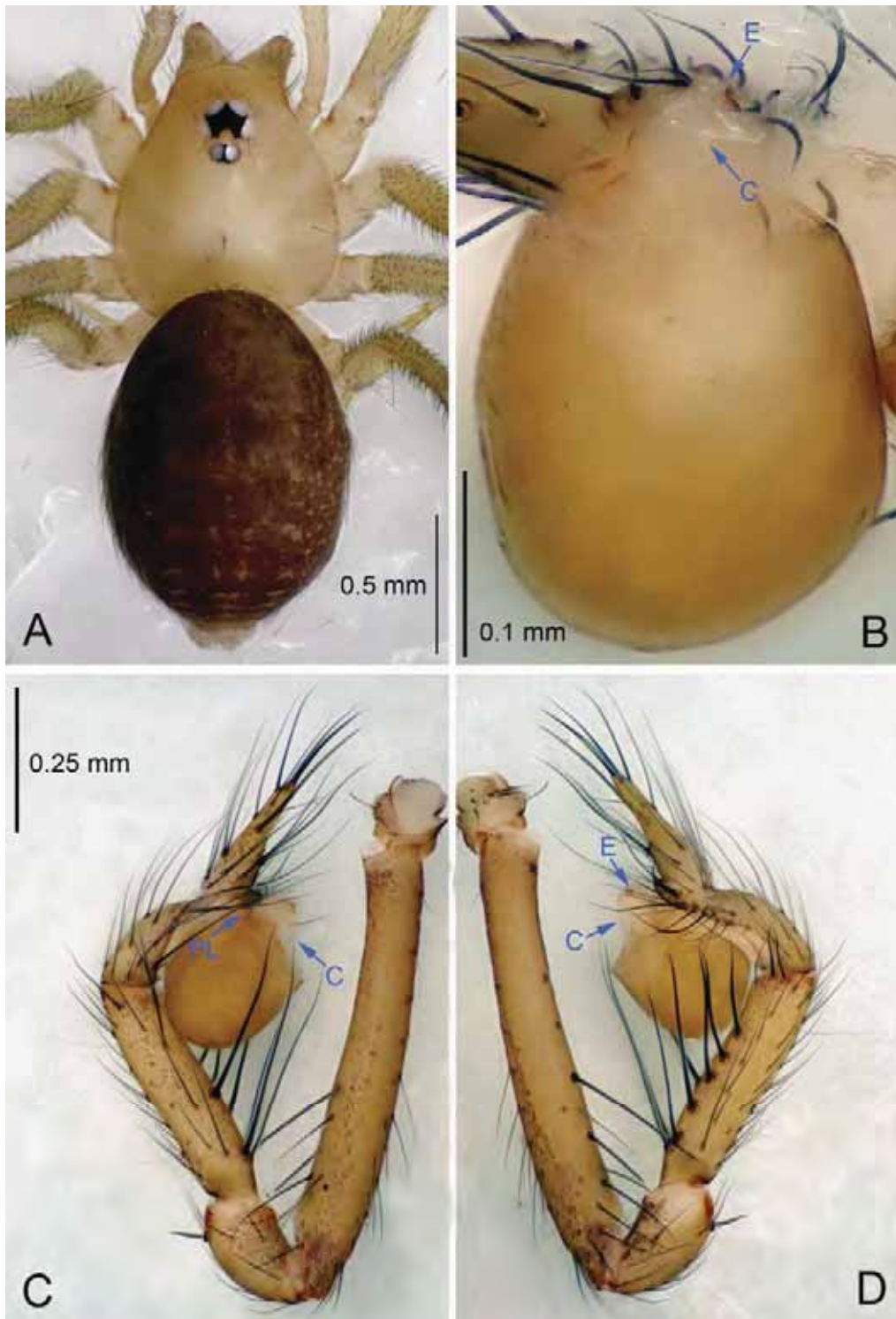
**FIGURE 28** *Leptonetela la* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



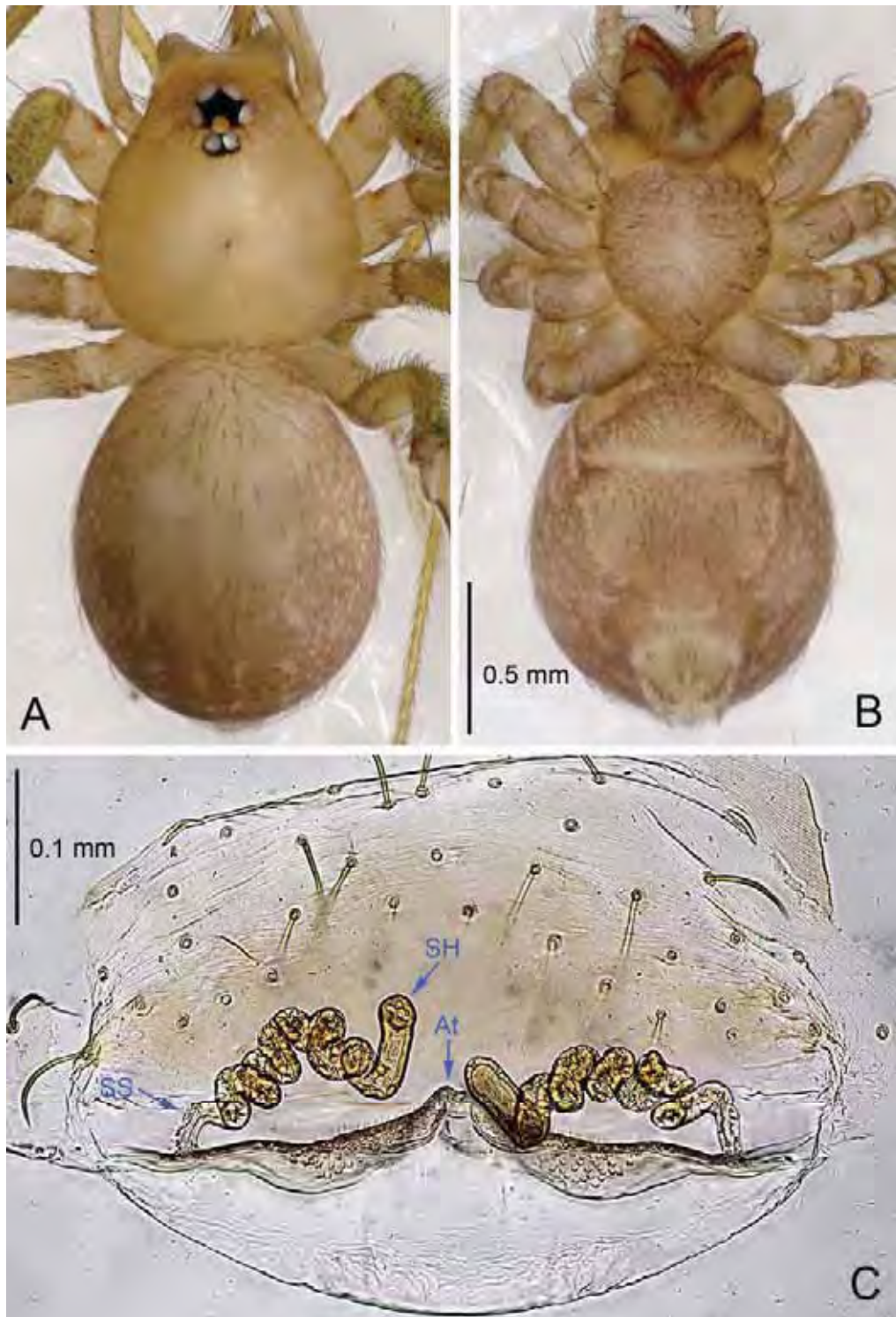
**FIGURE 29** *Leptonetela la* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



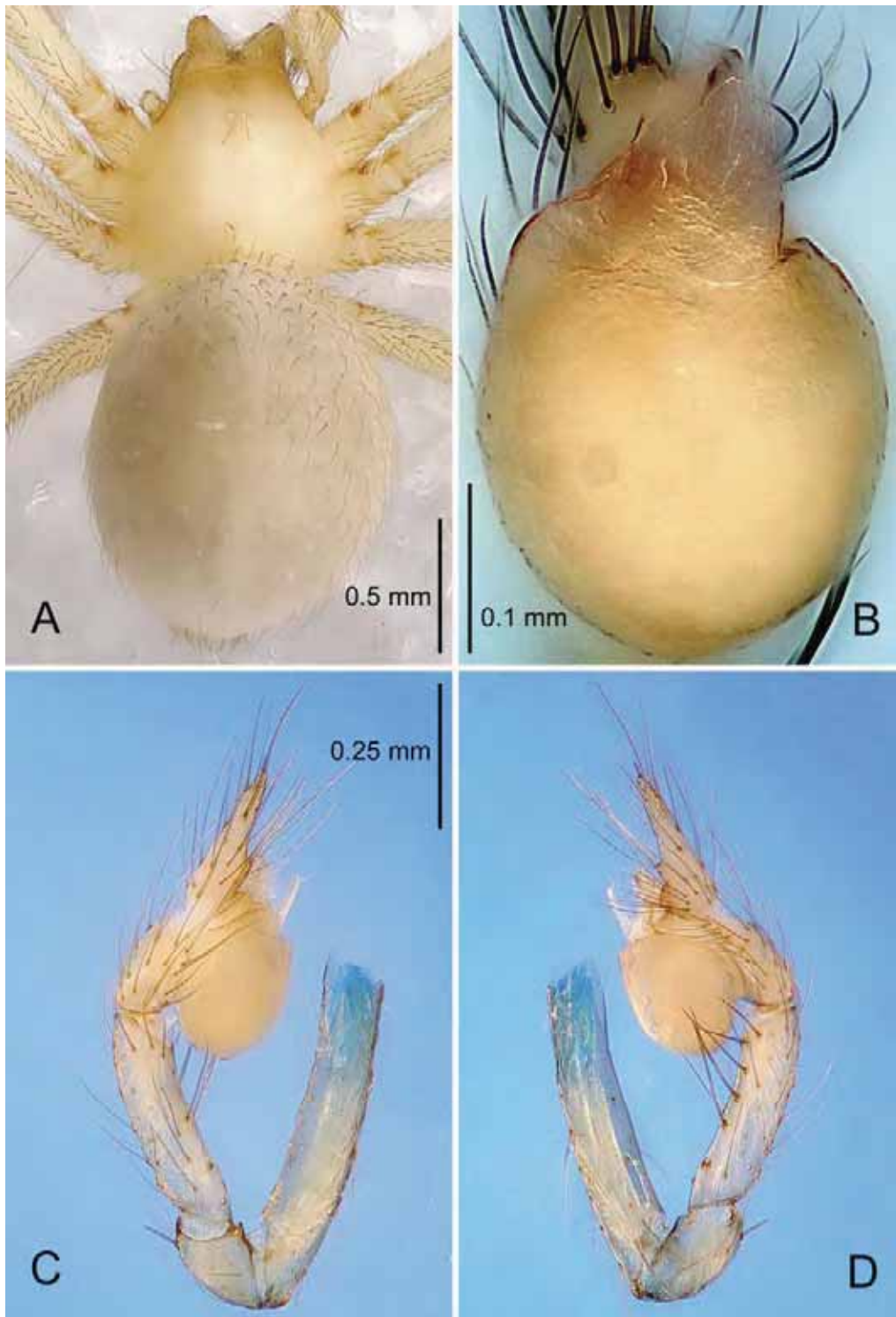


**FIGURE 30** *Leptonetela rudong* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



**FIGURE 31** *Leptonetela rudong* sp. nov., one of paratype females  
 A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 32** *Leptonetela wenzhu* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



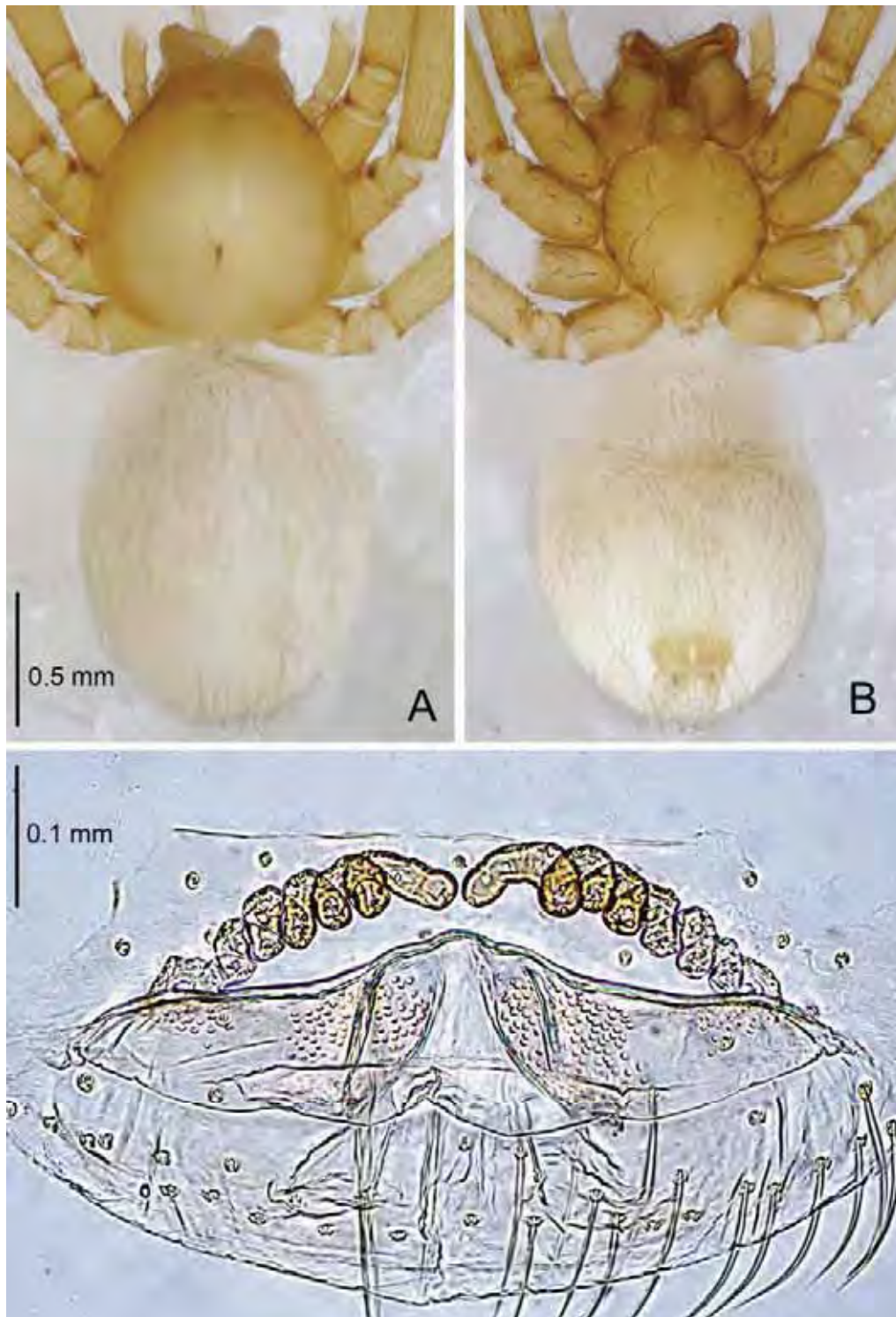


FIGURE 33 *Leptonetela wenzhu* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

**Diagnosis.** This new species is similar to *L. rudong* Wang & Li sp. nov., and *L. la* Wang & Li sp. nov. but can be distinguished by the male pedipalpal tibia with 6 spines retrolaterally (Fig. 32D), conductor bamboo leaf-shaped in ventral view (Fig. 32B) (tibia with 1 long seta, 6 spines retrolaterally in *L. rudong* Wang & Li sp. nov., tibia with 7 spines retrolaterally in *L. la* Wang & Li sp. nov., conductor broad, C tile-shaped in *L. la* Wang & Li sp. nov.; thin, triangular in *L. rudong* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 2.63 (Fig. 32A). Carapace 1.28 long, 1.03 wide. Opisthosoma 1.34 long, 1.09 wide. Carapace yellowish. Ocular area with a pair of setae, PME PLE absent, ALE reduced to white points. Median groove, cervical groove and radial furrows indistinct. Clypeus 0.25 high. Opisthosoma gray, ovoid. Leg measurements: I 10.17 (2.78, 0.37, 3.12, 2.34, 1.56); II 7.34 (2.53, 0.37, 1.94, 1.72, 0.78); III 7.70 (2.19, 0.37, 2.03, 1.88, 1.22); IV 9.28 (2.60, 0.37, 2.56, 2.28, 1.47). Male pedipalp (Figs 32C–D): tibia with 6 spines retrolaterally, arrange equidistantly. Embolus triangular, prolateral lobe absent. Median apophysis absent. Conductor bamboo leaf-shaped in ventral view (Fig. 32B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.88 (Figs 33A–B). Carapace 1.20 long, 1.00 wide. Opisthosoma 1.60 long, 1.20 wide. Clypeus 0.18 high. Leg measurements: I 8.62 (2.53, 0.37, 2.51, 1.90, 1.31); II 7.36 (2.09, 0.34, 1.94, 1.65, 1.34); III 6.18 (1.55, 0.31, 1.69, 1.47, 1.16); IV 7.98 (2.44, 0.31, 2.01, 1.88, 1.34). Vulva (Fig. 33C): spermathecae coiled, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela longli* Wang & Li sp. nov.**  
**Figs 34–35, 97**

**Type material. Holotype:** male (IZCAS), Underground River, 25.27°N, 107.44°E, Longli, Liuzhai Town, Nandan County, Hechi City, Guangxi Zhuang Autonomous Region, China, 29 January 2015, Y. Li & Z. Chen leg. **Paratypes:** 3 males and 4 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. chiosensis* Wang & Li, 2011, *L. panbao* Wang & Li sp. nov., but can be distinguished by the male pedipalpal tibial I, II and III spines strong, equally strong (Fig. 34D), conductor C tile-shaped (Fig. 34B) (tibia spine I strong, conductor triangular in *L. chiosensis*; tibia spines slender, cymbium with 1 strong spine on the earlobe-shaped process, conductor reduced, embolus with 1 tooth basally in *L. panbao* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 1.88 (Fig. 34A). Carapace 0.87 long, 0.75 wide. Opisthosoma 1.00 long, 0.80 wide. Carapace yellowish. Ocular area with a pair of setae, eyes six. Median groove, cervical grooves and radial furrows

indistinct. Clypeus 0.10 high. Opisthosoma gray, ovoid. Leg measurements: I 6.38 (1.75, 0.25, 1.88, 1.50, 1.00); II 5.03 (1.40, 0.25, 1.38, 1.25, 0.75); III 4.25 (1.37, 0.20, 1.13, 1.00, 0.55); IV 5.71 (1.63, 0.25, 1.60, 1.35, 0.88). Male pedipalp (Figs 34C–D): tibia with 3 long spines prolaterally, 5 spines retrolaterally, I spine longest, I, II III spines equally strong, stronger than others. Embolus triangular, prolateral lobe reduced. Median apophysis “J” shaped in ventral view. Conductor C tile-shaped in ventral view (Fig. 34B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 1.95 (Figs 35A–B). Carapace 0.88 long, 0.88 wide. Opisthosoma 1.25 long, 1.00 wide. Clypeus 0.10 high. Leg measurements: I 5.03 (1.38, 0.25, 1.50, 1.15, 0.75); II 4.58 (1.25, 0.25, 1.13, 1.10, 0.85); III 3.55 (1.00, 0.20, 0.88, 0.87, 0.60); IV 4.76 (1.30, 0.25, 1.38, 1.13, 0.70). Vulva (Fig. 35C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Guangxi).

***Leptonetela panbao* Wang & Li sp. nov.**  
**Figs 36–37, 97**

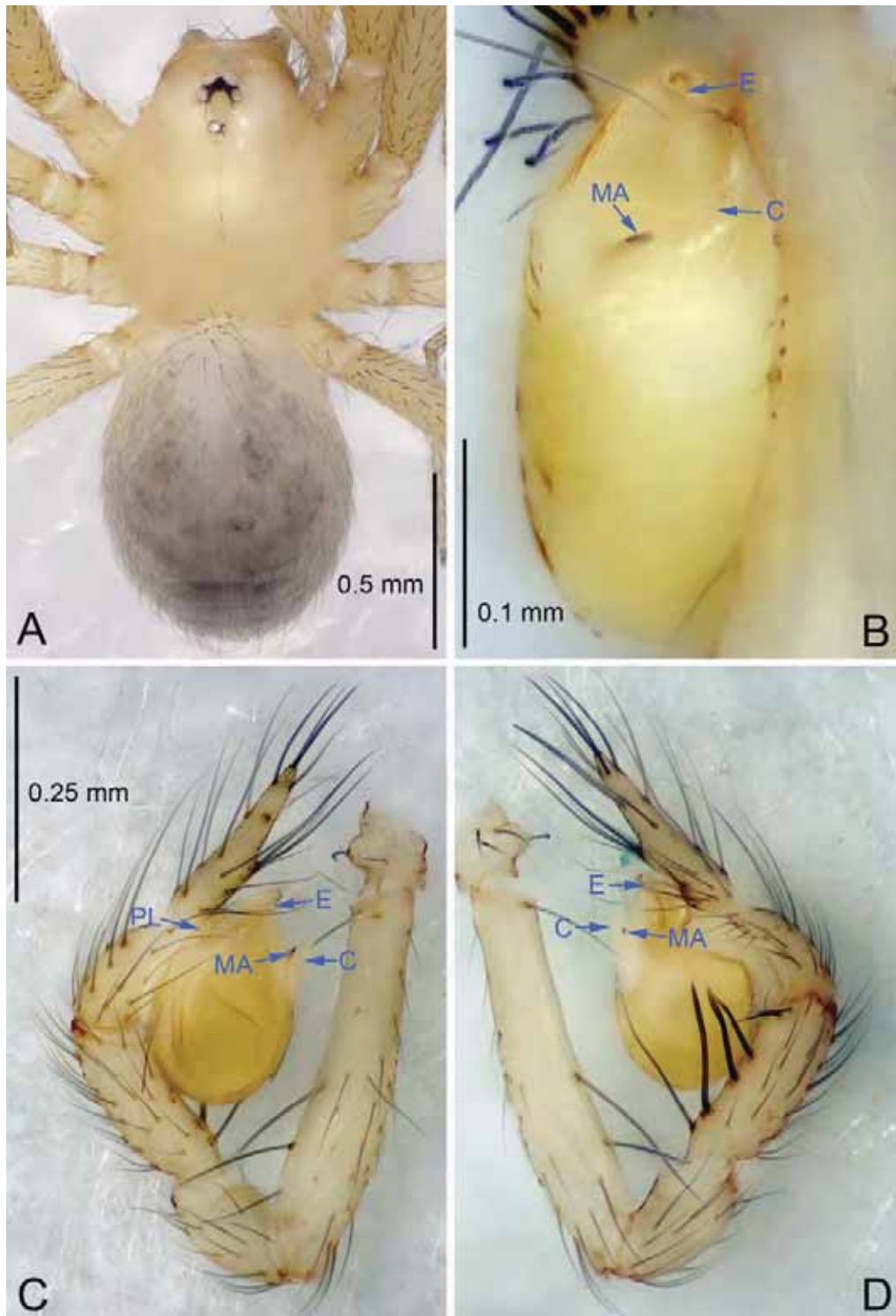
**Type material. Holotype:** male (IZCAS), Panbao Cave, 28.38°N, 108.67°E, Panbao, Shichang Town, Songtao County, Tongren City, Guizhou Province, China, 8 March 2013, H. Zhao & J. Liu leg. **Paratypes:** 2 male and 4 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. chiosensis* Wang & Li, 2011, *L. Longli* Wang & Li sp. nov., but can be distinguished by the male pedipalpal tibial spines slender, equally strong, cymbium with 1 strong spine on the earlobe-shaped process (Fig. 36D), conductor reduced, embolus with 1 tooth basally (Fig. 36B) (tibial I spine stronger than others, conductor triangular in *L. chiosensis*; tibial I, II and III spines equally strong, stronger than others, conductor C tile-shaped in *L. panbao* Wang & Li sp. nov.).

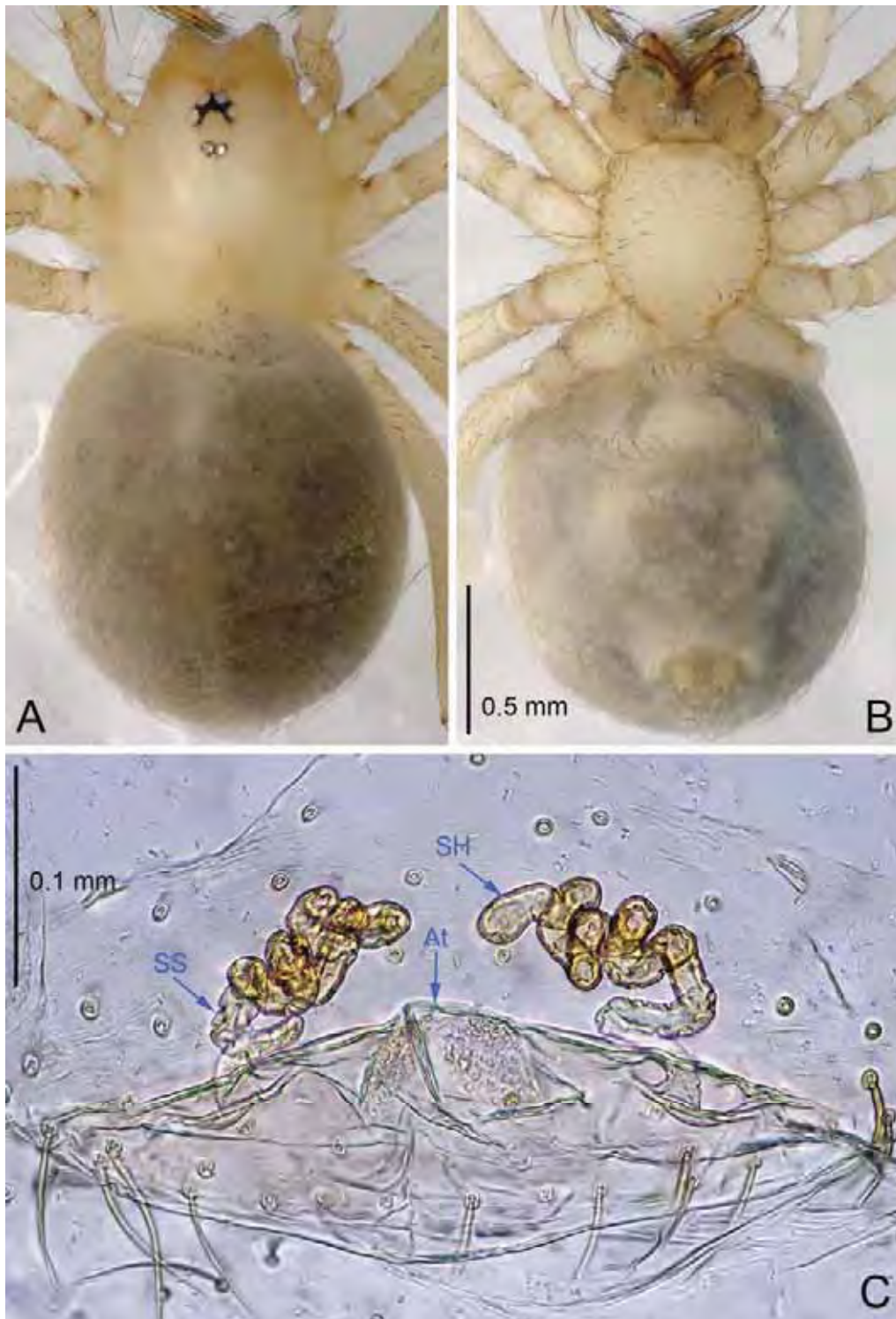
**Description. Male (holotype).** Total length 2.38 (Fig. 36A). Carapace 1.15 long, 1.00 wide. Opisthosoma 1.25 long, 0.90 wide. Carapace yellow. Eyes six. Median groove needle-shaped, cervical grooves and radial furrows distinct. Clypeus 0.13 high. Opisthosoma gray, ovoid. Leg measurements: I 10.50 (2.75, 0.35, 3.50, 2.40, 1.50); II 7.86 (2.13, 0.35, 2.35, 1.90, 1.13); III 6.22 (1.75, 0.34, 1.75, 1.38, 1.00); IV 8.43 (2.38, 0.35, 2.40, 2.05, 1.25). Male pedipalp (Figs 36C–D): tibia with 4 long spines prolaterally, 5 slender spines retrolaterally, the spines equally strong, I spine longest. Cymbium not wrinkled, earlobe-shaped process small, decorated with 1 spine. Embolus triangular, bearing a basal tooth, prolateral lobe oval. Median apophysis “I” shaped in ventral view. Conductor reduced (Fig. 36B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length

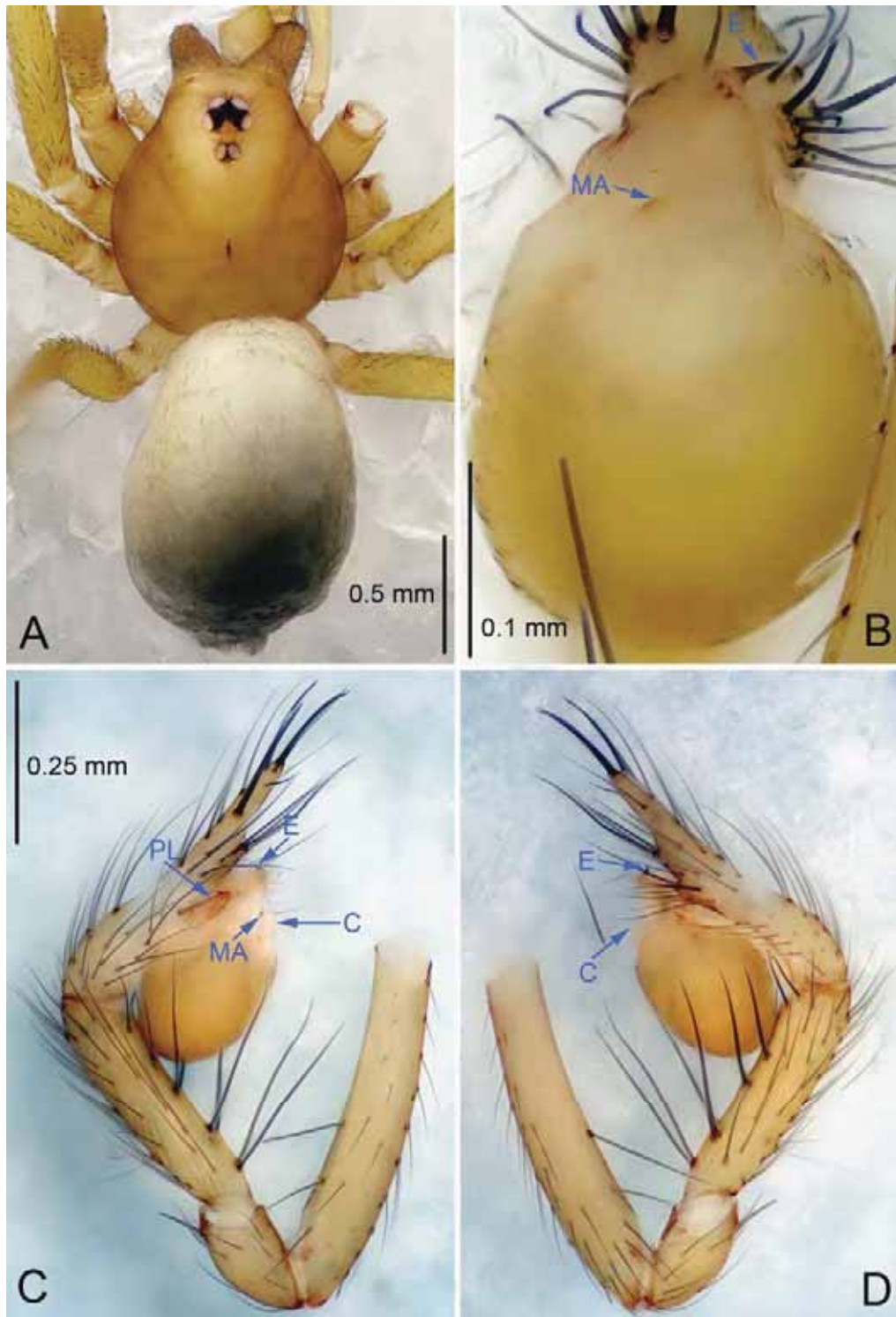


**FIGURE 34** *Leptonetela longli* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



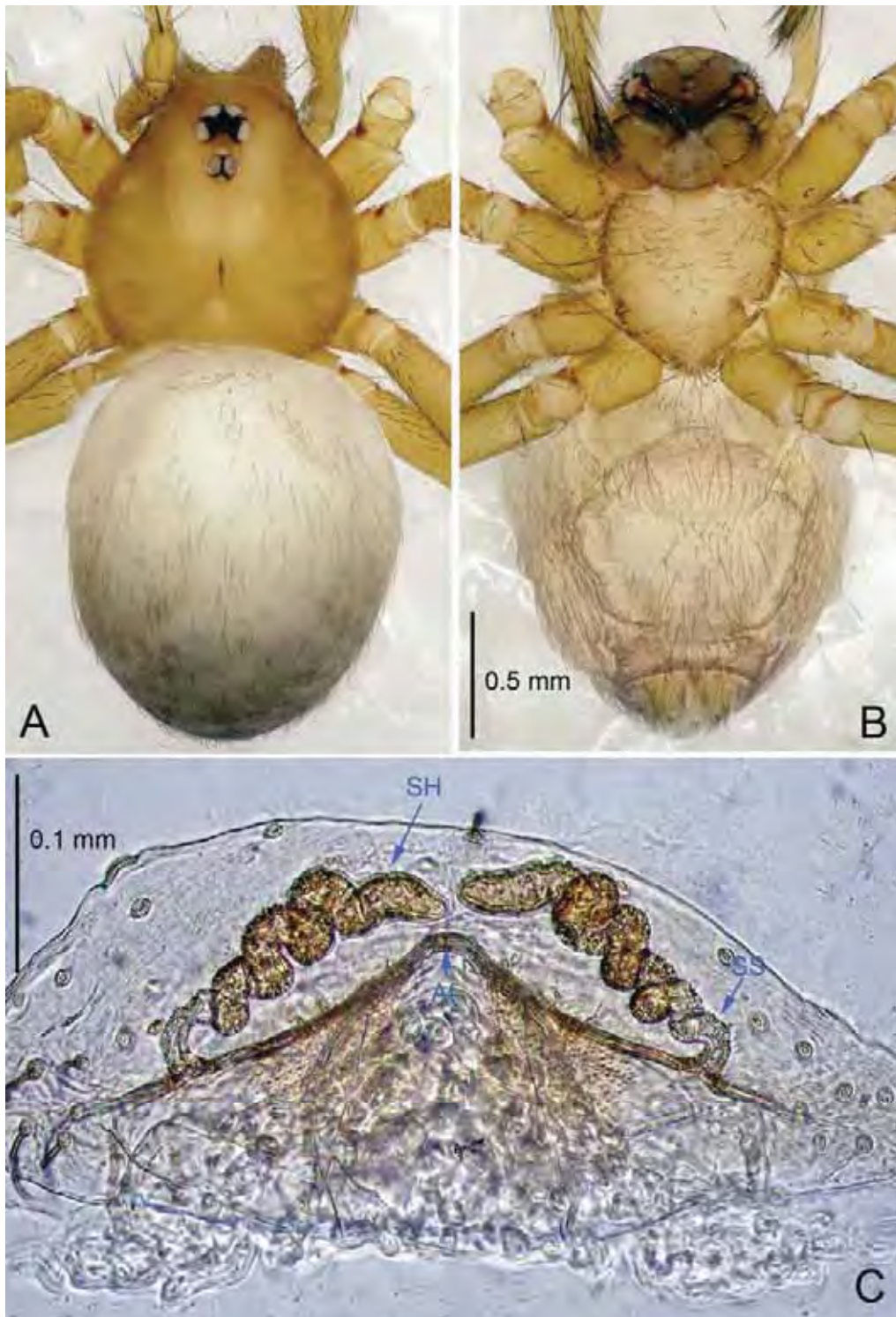


**FIGURE 35** *Leptonetela longli* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 36** *Leptonetela panbao* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





**FIGURE 37** *Leptonetela panbao* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



2.50 (Figs 37A–B). Carapace 1.13 long, 1.00 wide. Opisthosoma 1.62 long, 1.25 wide. Clypeus 0.13 high. Leg measurements: I 8.85 (2.30, 0.30, 2.62, 2.13, 1.50); II 6.81 (1.88, 0.30, 2.00, 1.50, 1.13); III 5.76 (1.63, 0.25, 1.63, 1.25, 1.00); IV 7.58 (2.25, 0.30, 2.13, 1.75, 1.15). Vulva (Fig. 37C): spermathecae coiled, atrium triangular, anterior margin of atrium covered with short hairs.

**Distribution.** China (Guizhou).

***Leptonetela feilong* Wang & Li sp. nov.**  
**Figs 38–39, 97**

**Type material. Holotype:** male (IZCAS), Feilong Cave, 26.44°N, 107.02°E, Longli Town, Qiannan Prefecture, Guizhou Province, China, 27 July 2012, H. Zhao leg. **Paratypes:** 9 females, same data as holotype; 1 female, Lianhua Cave, 26.43°N, 106.95°E, Lianhua Town, Qiannan Prefecture, Guizhou Province, China, 27 July 2012, H. Zhao leg.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. yangi* Lin & Li, 2010, *L. jiahe* Wang & Li sp. nov., but can be distinguished from *L. yangi* by the male pedipalpal cymbium constricted medially, attaching an earlobe-shaped process (Fig. 38D), conductor triangular (Fig. 38B) (cymbium not constricted, earlobe-shaped process absent, conductor reduced in *L. yangi*), from *L. jiahe* Wang & Li sp. nov. by the median apophysis “m” shaped, conductor triangular (male pedipalpal cymbium with 1 spine on the earlobe-shaped process, and 1 curved long spine medially, median apophysis like mastoid process, with 3 sclerotized spots distally, conductor C tile-shaped in *L. jiahe* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 2.31 (Fig. 38A). Carapace 1.02 long, 1.30 wide. Opisthosoma 1.30 long, 1.14 wide. Carapace yellowish. Ocular area with a pair of setae, eyes absent. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.15 high. Opisthosoma gray, ovoid. Leg measurements: I 9.53 (2.66, 0.40, 2.81, 2.19, 1.47); II 8.09 (2.41, 0.40, 2.41, 1.93, 0.94); III 7.17 (2.03, 0.40, 1.94, 1.72, 1.08); IV 8.82 (2.71, 0.41, 2.51, 1.94, 1.25). Male pedipalp (Figs 38C–D): tibia with 2 long setae prolaterally, 5 spines retrolaterally, spines I, II III equally strong, I spine longest. Cymbium constricted medially, attaching an earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe nearly absent. Median apophysis “m” shaped. Conductor triangular (Fig. 38B).

**Female (one of the paratypes).** Similar to male in color and general features, but smaller and with shorter legs. Total length 2.13 (Figs 39A–B). Carapace 0.88 long, 0.88 wide. Opisthosoma 1.25 long, 0.87 wide. Clypeus 0.08 high. Leg measurements: I 8.44 (2.38, 0.30, 2.51, 1.87, 1.38); II 7.48 (2.05, 0.31, 2.25, 1.62, 1.25); III 6.20 (1.75, 0.31, 1.75, 1.38, 1.01); IV 7.73 (2.25, 0.32, 2.25, 1.78, 1.13). Vulva (Fig. 39C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Guizhou).

***Leptonetela jiahe* Wang & Li sp. nov.**  
**Figs 40–41, 97**

**Type material. Holotype:** male (IZCAS), Jiahe Cave, 25.25°N, 110.20°E, Lingui Town, Lingui County, Guilin City, Guangxi Zhuang Autonomous Region, China, 20 December 2013, H. Zhao leg. **Paratypes:** 3 males and 5 females, same data as holotype; 6 males and 5 females, Flytiger Cave, 25.25°N, 110.20°E, Lingui Town, Lingui County, Guilin City, Guangxi Zhuang Autonomous Region, China, 20 December 2013, H. Zhao leg.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. yangi* Lin & Li, 2010, and *L. feilong* Wang & Li sp. nov., but can be distinguished by the male pedipalpal cymbium with 1 short spine on the earlobe-shaped process, and 1 curved, long spine retrolaterally (Fig. 40D), median apophysis like mastoid process, tip with 3 sclerotized spots, conductor C tile-shaped (Fig. 40B) (median apophysis “m” shaped in *L. yangi* and *L. feilong* Wang & Li sp. nov., conductor reduced in *L. yangi*; triangular in *L. feilong* Wang & Li sp. nov.).

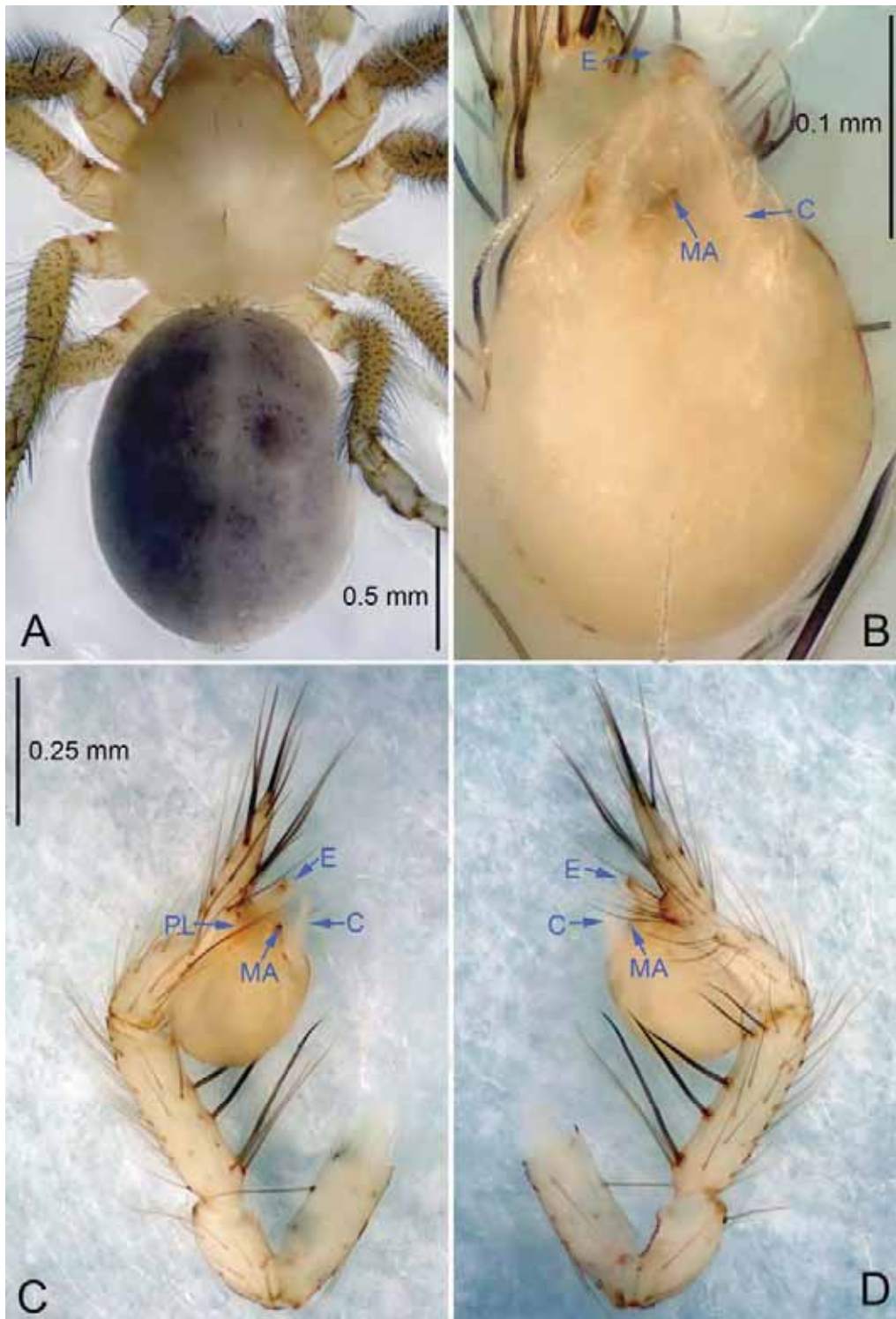
**Description. Male (holotype).** Total length 2.43 (Fig. 40A). Carapace 1.03 long, 0.90 wide. Opisthosoma 1.43 long, 1.22 wide. Carapace yellowish. Ocular area with a pair of setae, eyes six. Median groove, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma white, ovoid. Leg measurements: I 9.22 (2.48, 0.38, 2.66, 2.20, 1.50); II 7.58 (2.13, 0.35, 2.20, 1.75, 1.15); III 6.21 (1.75, 0.30, 1.63, 1.53, 1.00); IV 8.11 (2.25, 0.35, 2.13, 2.00, 1.38). Male pedipalp (Figs 40C–D): tibia with 5 slender spines retrolaterally, I, II and III spines equally strong, stronger than others, I spine longest. Cymbium constricted medially, retrolaterally attaching 1 curved spine and an earlobe-shaped process, which decorated with 1 short spine. Embolus triangular, and prolateral lobe absent. Median apophysis like mastoid process, with 3 sclerotized spots distally. Conductor C tile-shaped (Fig. 40B).

**Female (one of the paratypes).** Similar to male in color and general features, but smaller and with shorter legs. Total length 2.30 (Figs 41A–B). Carapace 0.93 long, 0.80 wide. Opisthosoma 1.45 long, 1.28 wide. Clypeus 0.13 high. Leg measurements: I - (1.95, 0.38, -, -, -); II 5.91 (1.63, 0.35, 1.70, 1.25, 0.98); III 4.96 (1.38, 0.33, 1.30, 1.12, 0.83); IV 6.53 (1.85, 0.35, 1.78, 1.50, 1.05). Vulva (Fig. 41C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Guangxi).

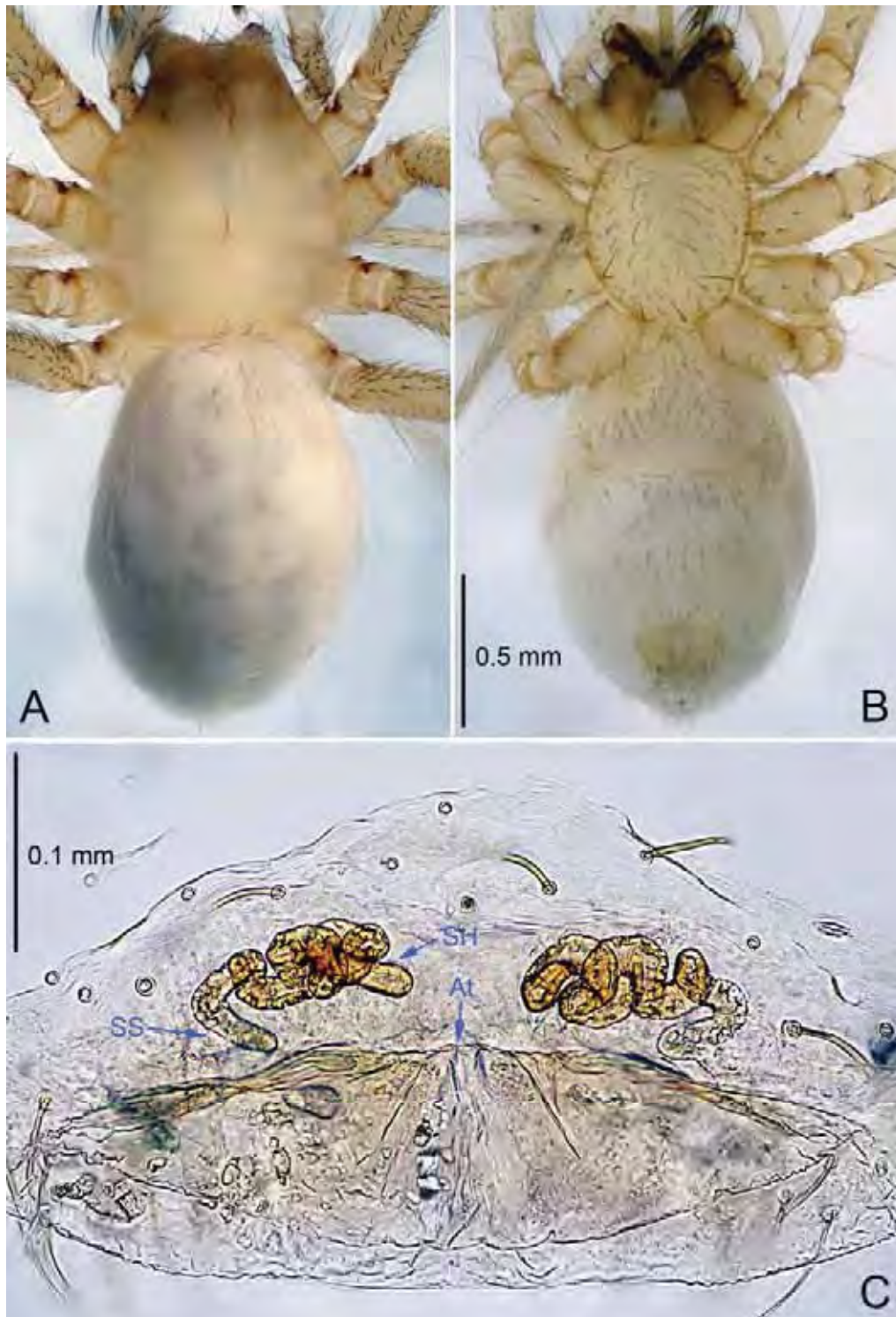
***Leptonetela xianren* Wang & Li sp. nov.**  
**Figs 42–43, 97**

**Type material. Holotype:** male (IZCAS), Xianren Cave, 29.73°N, 110.31°E, Yepingxini, Zouma Town, Hefeng County, Enshi Tujia and Miao Autonomous Prefecture, Hubei Province, China, 27 January 2011, Y. Li & J. Liu leg. **Paratypes:** 2 males and 3 females, same data as holotype.



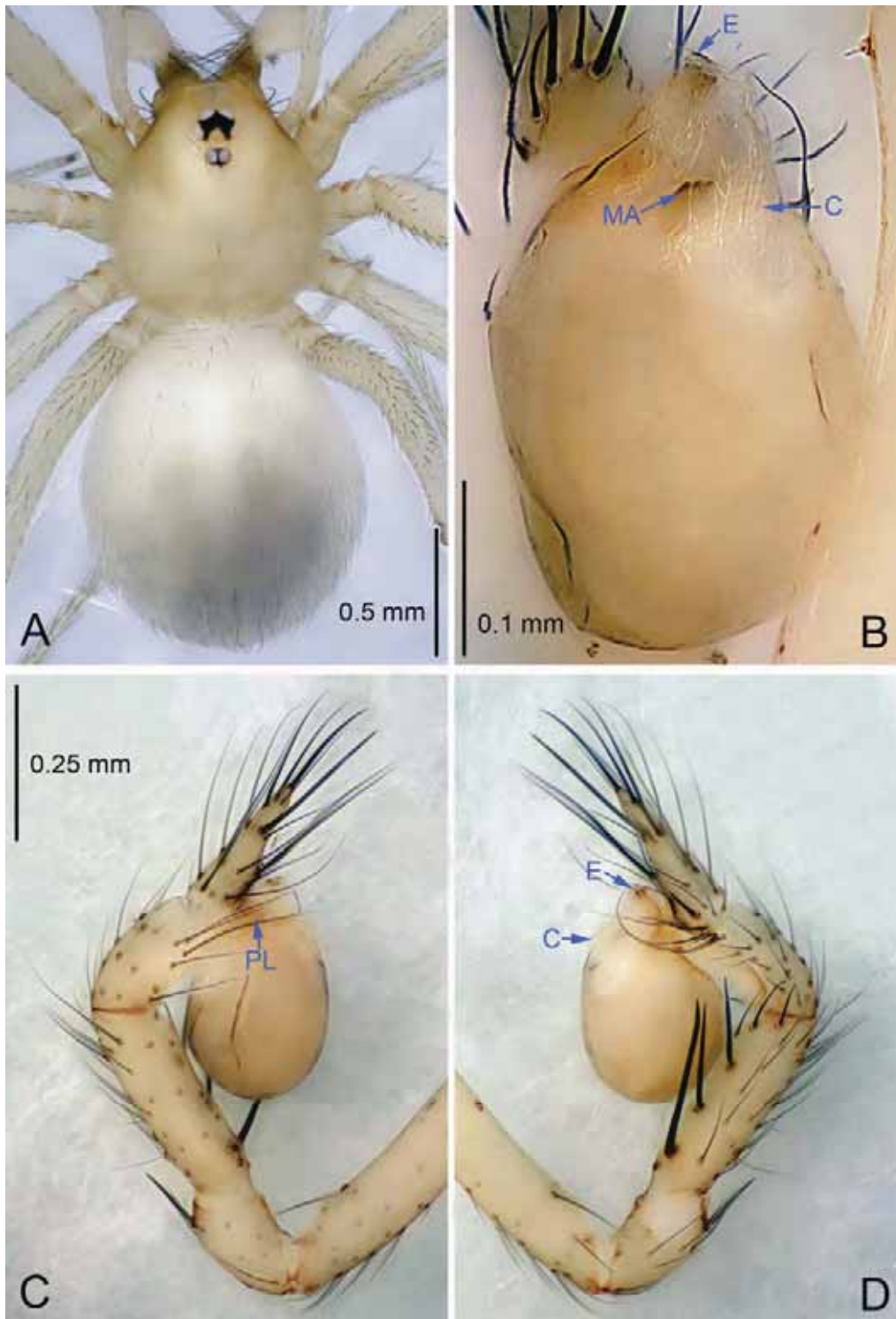
**FIGURE 38** *Leptonetela feilong* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



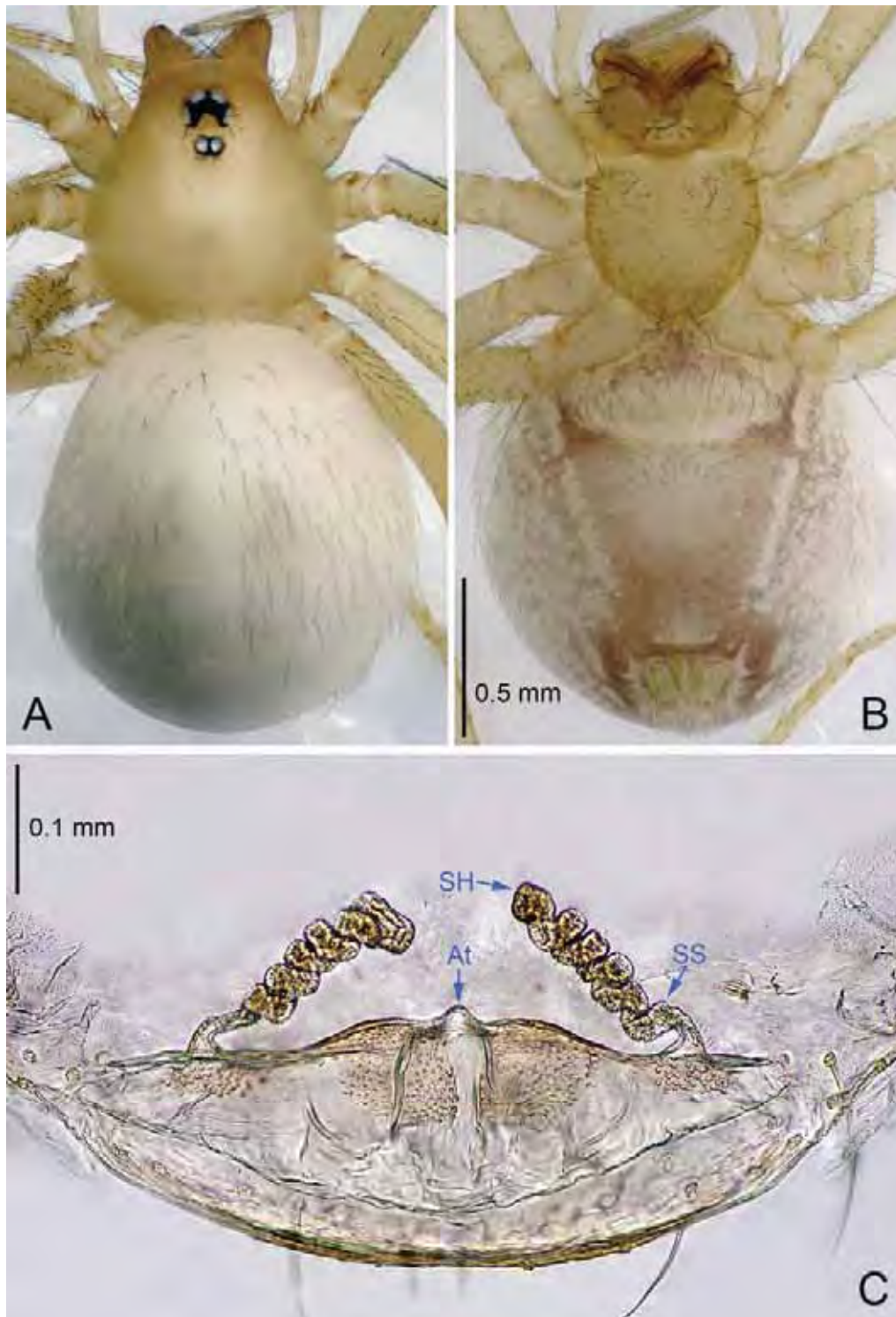
**FIGURE 39** *Leptonetela feilong* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.





**FIGURE 40** *Leptonetela jiahe* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



**FIGURE 41** *Leptonetela jiahe* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. liping* Lin & Li, 2010, and *L. parlonga* Wang & Li, 2011, but can be distinguished by the male pedipalpal tibia with 5 slender spines retrolaterally, with I spine longest (Fig. 42D) (tibia with 5 spines retrolaterally, I spine strong and longest in *L. liping*, 6 slender spines in *L. parlonga*); median apophysis triangular (Fig. 42B) (median apophysis like mastoid process in *L. liping*; ligulate in *L. parlonga*); from *L. parlonga* by the cymbium retrolaterally with 1 ox horn-shaped spine on the earlobe-shaped process in *L. parlonga*.

**Description. Male (holotype).** Total length 2.23 (Fig. 42A). Carapace 0.95 long, 0.93 wide. Opisthosoma 1.25 long, 0.88 wide. Carapace yellow. Ocular zone with a pair of setae, eyes absent. Median groove, cervical groove and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma gray, ovoid, lacking distinctive pattern. Leg measurements: I 8.99 (2.50, 0.38, 2.48, 2.00, 1.63); II 8.48 (2.38, 0.37, 2.28, 1.90, 1.55); III 7.12 (2.03, 0.33, 1.88, 1.63, 1.25); IV 7.88 (2.48, 0.38, 2.07, 1.60, 1.35). Leg formula: I-II-IV-III. Male pedipalp (Figs 42C–D): femur with 5 spines ventrally, tibia with 3 long setae prolaterally, 2 long setae and 5 slender spines retrolaterally, with I spine longest. Cymbium constricted medially, attaching an earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe indistinct. Median apophysis triangular. Conductor bamboo leaf-shaped in ventral view (Fig. 42B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.38 (Figs 43A–B). Carapace 0.85 long, 0.83 wide. Opisthosoma 1.55 long, 1.03 wide. Clypeus 0.15 high. Leg measurements: I 8.11 (2.25, 0.38, 2.20, 1.88, 1.40); II 7.71 (2.18, 0.35, 2.13, 1.70, 1.35); III 6.76 (2.00, 0.35, 1.78, 1.50, 1.13); IV 7.79 (2.45, 0.40, 2.03, 1.58, 1.33). Vulva (Fig. 43C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Hubei).

***Leptonetela tiangkeng* Wang & Li sp. nov.**  
**Figs 44–45, 97**

**Type material. Holotype:** male (IZCAS), Tiangkeng Cave, 26.64°N, 104.80°E, Hegou, Dewu Town, Zhongshan County, Liupanshui City, Guizhou Province, China, 9 November 2011, H. Chen & Z. Zha leg. **Paratypes:** 4 males and 5 females, same data as holotype; 2 females, Luoshui Cave, 26.64°N, 104.80°E, Hegou, Dewu Town, Zhongshan County, Liupanshui City, Guizhou Province, China, 9 November 2011, H. Chen & Z. Zha leg.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. rudicula* Wang & Li, 2011, but can be distinguished by the male pedipalpal tibia with 6 spines retrolaterally (Fig. 44D), prolateral lobe indistinct (Fig. 44C), conductor broad and long, distal edge wavy line-shaped

(Fig. 44B) (5 spines retrolaterally, prolateral lobe oval, conductor short, C tile-shaped *L. rudicula*).

**Description. Male (holotype).** Total length 2.03 (Fig. 44A). Carapace 1.00 long, 0.85 wide. Opisthosoma 1.10 long, 0.88 wide. Carapace yellow. Ocular area with a pair of setae, eyes absent. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma yellowish, ovoid. Leg measurements: I 9.30 (2.48, 0.35, 2.81, 2.23, 1.43); II 8.46 (2.35, 0.35, 2.30, 2.18, 1.28); III 7.11 (2.05, 0.30, 1.98, 1.75, 1.03); IV 8.51 (2.43, 0.35, 2.33, 2.15, 1.25). Male pedipalp (Figs 44C–D): tibia with 5 long setae prolaterally, 6 slender spines retrolaterally, with I spine longest. Cymbium slightly constricted medially, attaching an earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe indistinct. Median apophysis flake-like, sclerotized distally. Conductor broad, distal edge wavy line-shaped (Fig. 44B).

**Female (one of the paratypes).** Similar to male in color and general features, but smaller and with shorter legs. Total length 1.93 (Figs 45A–B). Carapace 0.83 long, 0.73 wide. Opisthosoma 1.13 long, 0.98 wide. Clypeus 0.13 high. Leg measurements: I 7.68 (2.23, 0.34, 2.23, 1.63, 1.25); II 6.41 (1.90, 0.35, 1.78, 1.38, 1.00); III 5.69 (1.68, 0.28, 1.58, 1.38, 0.77); IV 7.19 (2.00, 0.33, 2.03, 1.70, 1.13). Vulva (Fig. 45C): spermathecae coiled, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela mayang* Wang & Li sp. nov.**  
**Figs 46–47, 94**

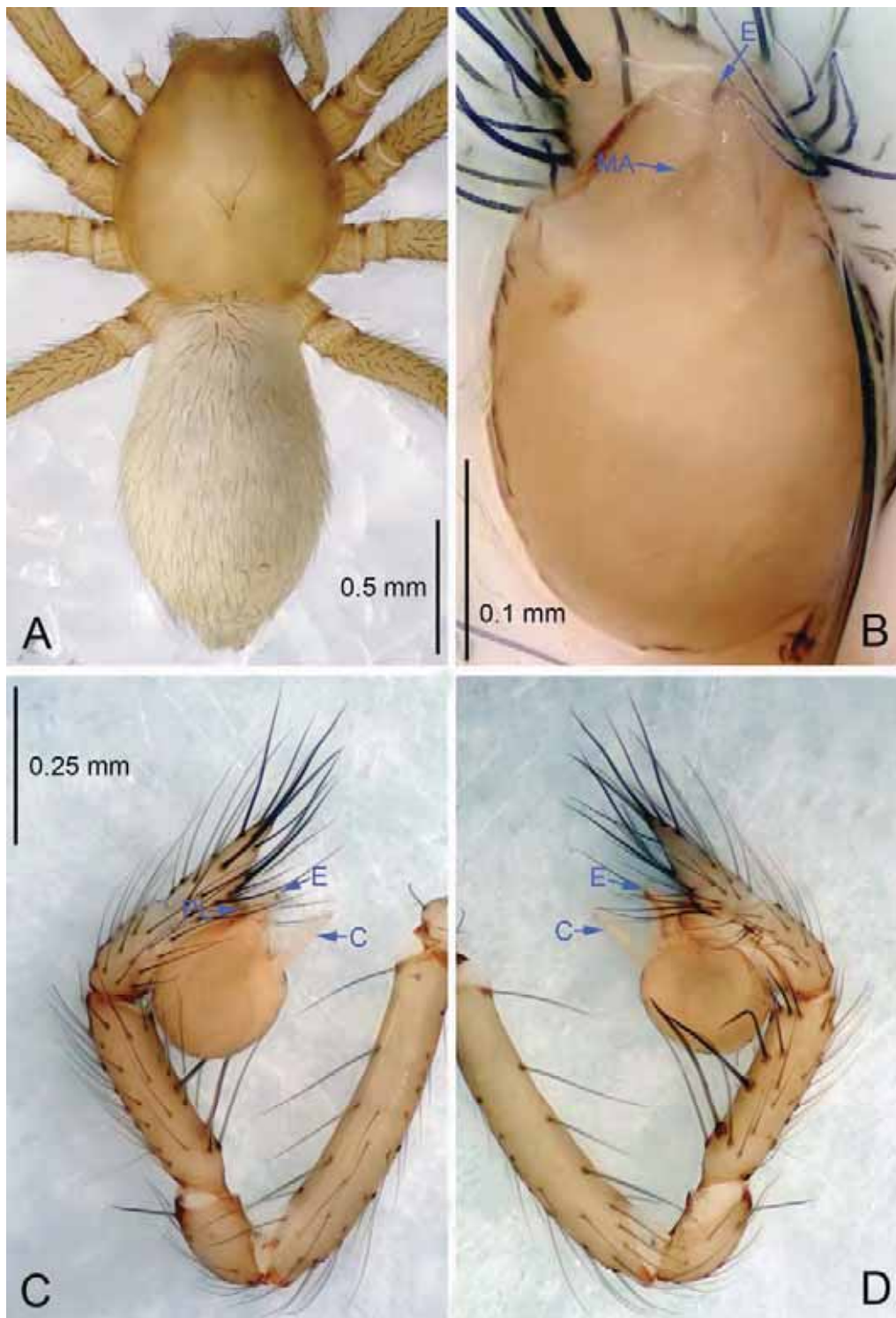
**Type material. Holotype:** male (IZCAS), Mayang Cave, 28.55°N, 108.06°E, Quankou, Dejiang County, Tongren City, Guizhou Province, China, 10 August 2012, H. Zhao leg. **Paratype:** 1 female, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

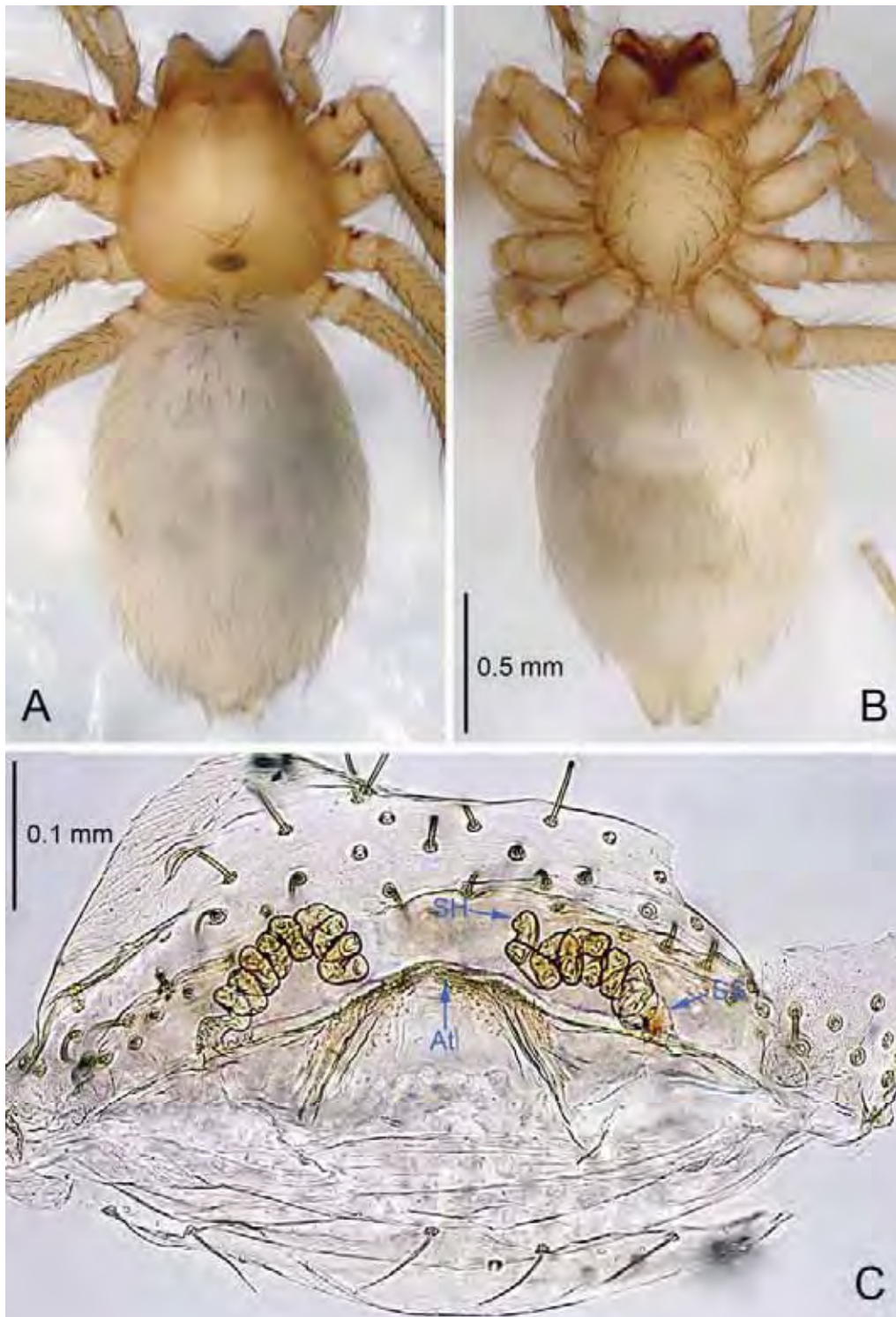
**Diagnosis.** This new species can be distinguished from all other species of the genus by the male pedipalpal cymbium retrolateral with one curved, short spine medially, median apophysis triangle, spermathecae not tightly twisted, just screwy in the female.

**Description. Male (holotype).** Total length 2.13 (Fig. 46A). Carapace 1.10 long, 0.75 wide. Opisthosoma 0.90 long, 1.00 wide. Carapace white. Eye absent. Median groove, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma white, ovoid. Leg measurements: I 8.98 (2.50, 0.30, 2.63, 2.05, 1.50); II 7.68 (2.13, 0.30, 2.25, 1.75, 1.25); III 6.76 (2.00, 0.25, 1.88, 1.63, 1.00); IV 8.21 (2.25, 0.30, 2.38, 1.88, 1.40). Male pedipalp (Figs 46C–D): tibia with 3 long setae prolaterally, and 5 slender spines retrolaterally, the spine I longest. Cymbium not wrinkled, earlobe-shaped process indistinct, and with 1 curved, short spine retrolaterally. Bulb with spoon-shaped embolus, prolateral lobe indistinct. Median

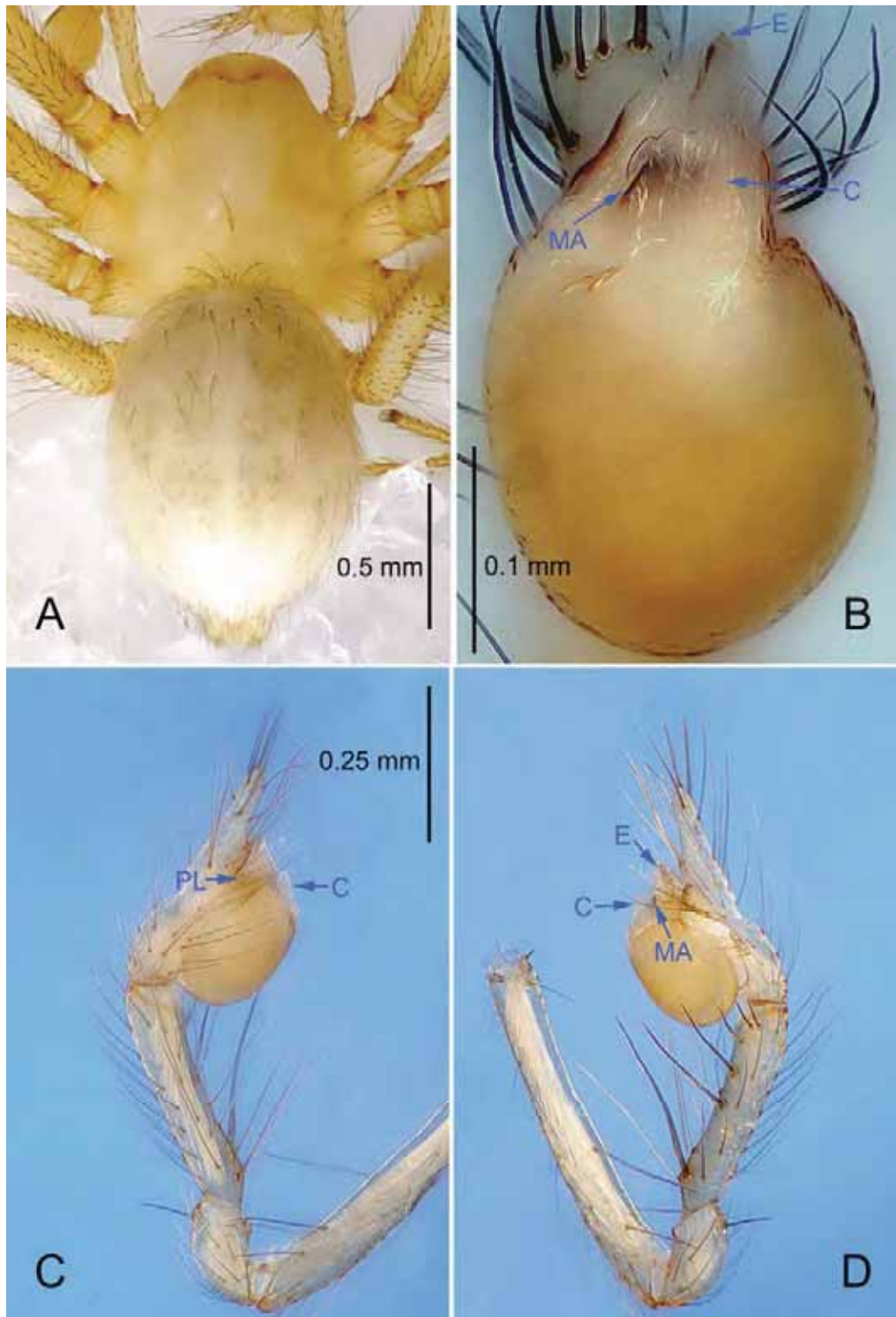




**FIGURE 42** *Leptonetela xianren* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.

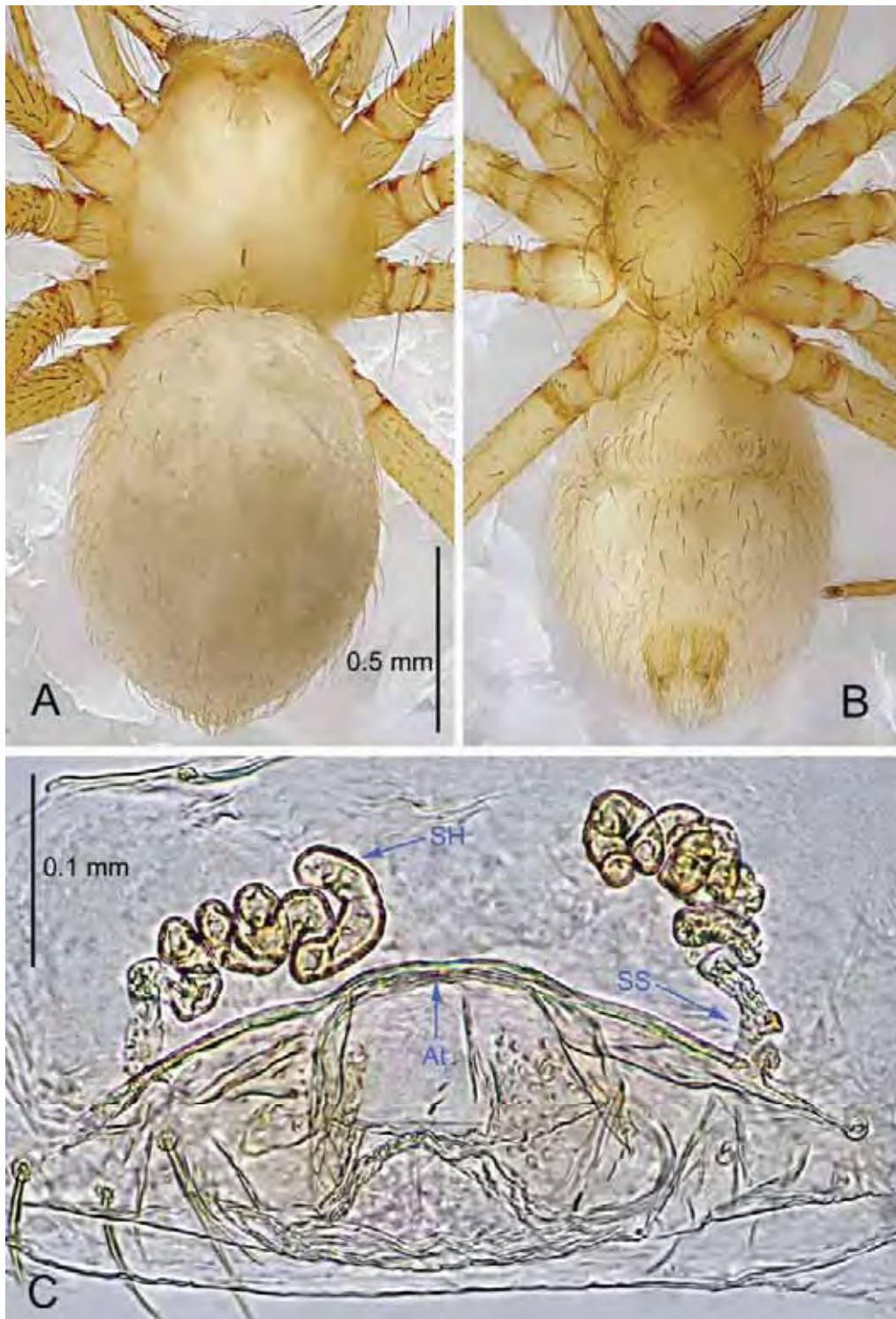


**FIGURE 43** *Leptonetela xianren* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

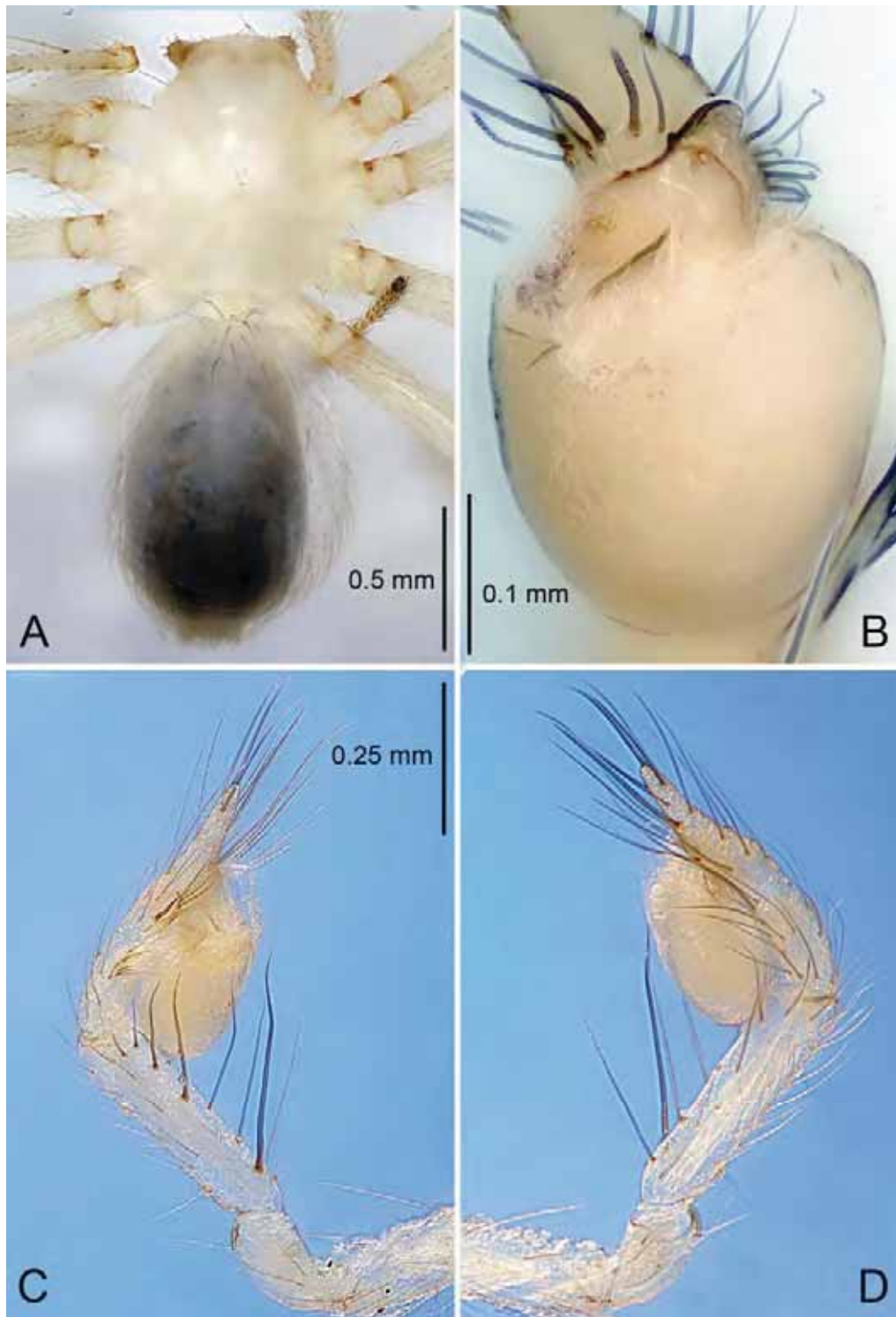


**FIGURE 44** *Leptonetela tiangkeng* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





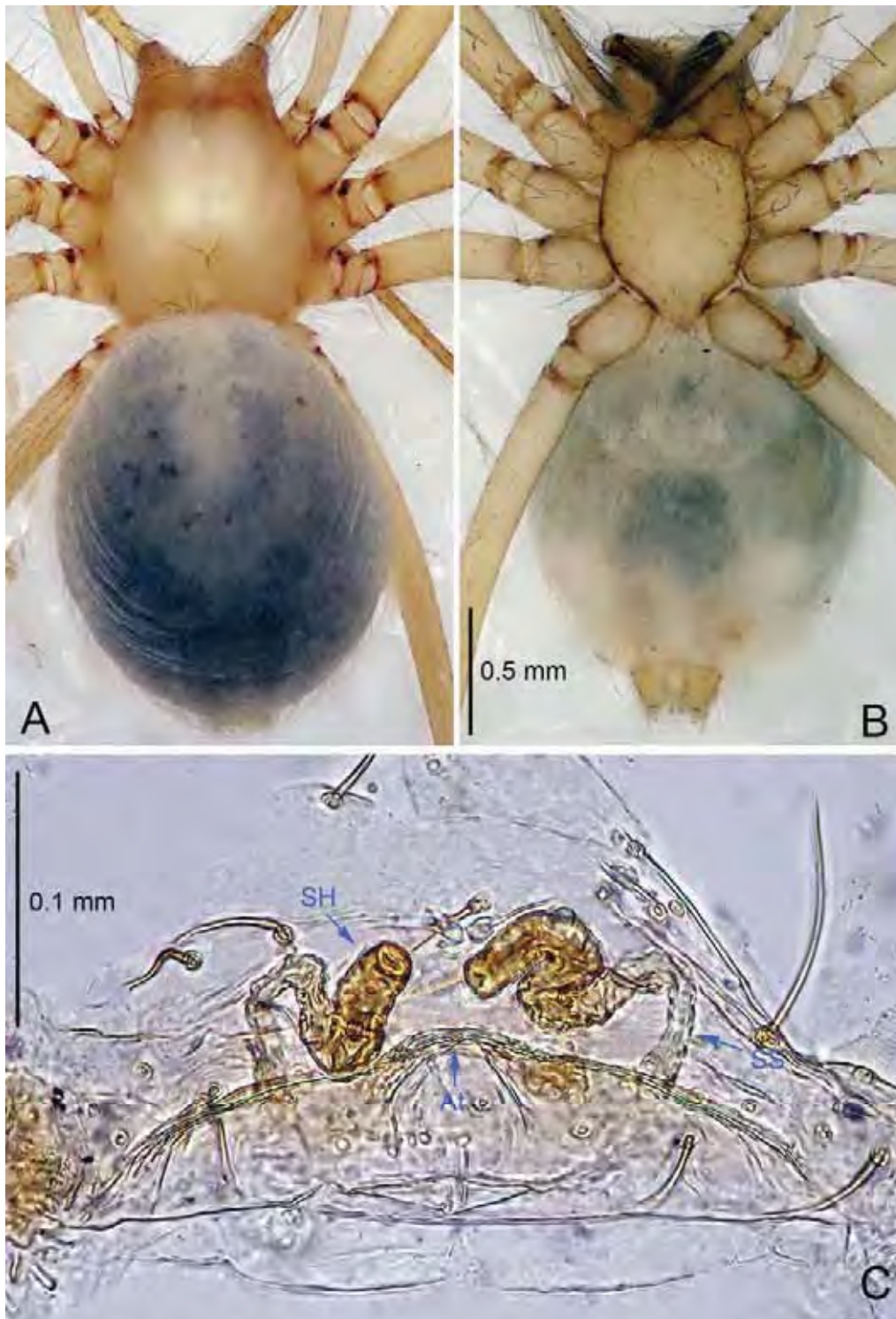
**FIGURE 45** *Leptonetela tiangkeng* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 46** *Leptonetela mayang* sp. nov., holotype male

A: Habitus, dorsal view; B: Right palpal bulb, ventral view; C: Right palp, retrolateral view; D: Right palp, prolateral view.





**FIGURE 47** *Leptonetela mayang* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



apophysis triangular in ventral view. Conductor thin, triangular in ventral view (Fig. 46B).

**Female.** Similar to male in color and general features, but larger and with shorter legs. Total length 2.37 (Figs 47A–B). Carapace 0.88 long, 0.88 wide. Opisthosoma 1.65 long, 1.00 wide. Clypeus 0.13 high. Leg measurements: I - (2.25, 0.30, -, -, -); II 6.81 (2.00, 0.30, 1.88, 1.50, 1.13); III 6.16 (1.88, 0.25, 1.75, 1.38, 0.90); IV 7.28 (2.13, 0.30, 2.00, 1.60, 1.25). Vulva (Fig. 47C): spermathecae screwy, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela gubin* Wang & Li sp. nov.**  
**Figs 48–49, 97**

**Type material. Holotype:** male (IZCAS), Gubin River, 26.50°N, 107.52°E, Gubin, Xingshan Town, Majiang County, Shengkaili City, Guizhou Province, China, 28 November 2011, H. Chen & Z. Zha leg. **Paratypes:** 22 males and 14 females, same data as holotype; 4 males and 5 females, nameless Cave, 26.50°N, 107.52°E, Gubin, Xingshan Town, Majiang County, Shengkaili City, Guizhou Province, China, 28 November 2011, H. Chen & Z. Zha leg.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. jinsha* Lin & Li, 2010, *L. quinquespinata* (Chen & Zhu, 2008) *L. xinhua* Wang & Li sp. nov., *L. lujia* Wang & Li sp. nov. and *L. xinhua* Wang & Li sp. nov. but can be distinguished by the male pedipalpal tibia with 4 slender spines prolaterally, 5 slender spines retrolaterally, with I, II spines equally length, cymbium with 2 long curved spines on earlobe-shaped process retrolaterally (Fig. 48D) (tibia with 3 long setae prolaterally, 1 long setae and 5 spines retrolaterally, with I spine strongest, tip asymmetrically bifurcated in *L. jinsha*; tibia with 3 long setae prolaterally, 6 large spines retrolaterally, with I spine longest in *L. quinquespinata*; tibia with 4 long setae prolaterally, 5 slender spines retrolaterally, with I spine longest, II III spines equally length in *L. lujia* Wang & Li sp. nov.; embolus bifurcated, tibia with 5 slender spines prolaterally, 5 slender spines retrolaterally, conductor triangular in *L. xinhua* Wang & Li sp. nov.;); from *L. jinsha*, *L. lujia* Wang & Li sp. nov. and *L. xinhua* Wang & Li sp. nov. by the conductor semicircular, base of median apophysis distinctly swollen, 4 times wider than the tip (Fig. 48B) (conductor broad, tip wavy line-shaped in *L. jinsha*; conductor thin, triangular in *L. lujia* Wang & Li sp. nov. and *L. xinhua* Wang & Li sp. nov.; base of median apophysis slightly swollen in *L. jinsha*, *L. lujia* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 1.88 (Fig. 48A). Carapace 0.80 long, 0.78 wide. Opisthosoma 1.13 long, 0.93 wide. Carapace yellowish. Ocular area with a pair of setae, eyes absent. Median groove need-shaped, cervical grooves and radial furrows distinct. Clypeus 0.13 high. Opisthosoma gray, ovoid, lacking distinctive pattern. Leg measurements: I

7.51 (2.00, 0.38, 2.13, 1.75, 1.25); II 6.48 (1.75, 0.35, 1.80, 1.43, 1.15); III 5.51 (1.63, 0.35, 1.40, 1.25, 0.88); IV 6.82 (1.88, 0.35, 1.88, 1.58, 1.13). Male pedipalp (Figs 48C–D): tibia with 4 long spines prolaterally and 5 spines retrolaterally, with I, II spines equally length. Cymbium constricted medially, earlobe-shaped process with 2 long curved spines retrolaterally. Embolus triangular, prolateral lobe absent. Median apophysis digital-shaped, base distinctly swollen. Conductor smooth, semicircle in ventral view (Fig. 48B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with longer legs. Total length 2.30 (Figs 49A–B). Carapace 0.88 long, 0.85 wide. Opisthosoma 1.40 long, 0.95 wide. Clypeus 0.15 high. Leg measurements: I 7.69 (2.13, 0.38, 2.25, 1.65, 1.28); II 6.71 (1.90, 0.38, 1.95, 1.40, 1.08); III 5.85 (1.75, 0.35, 1.50, 1.35, 0.90); IV 7.02 (2.00, 0.38, 1.93, 1.58, 1.13). Vulva (Fig. 49C): spermathecae coiled, atrium triangular.

**Distribution.** China (Guizhou).

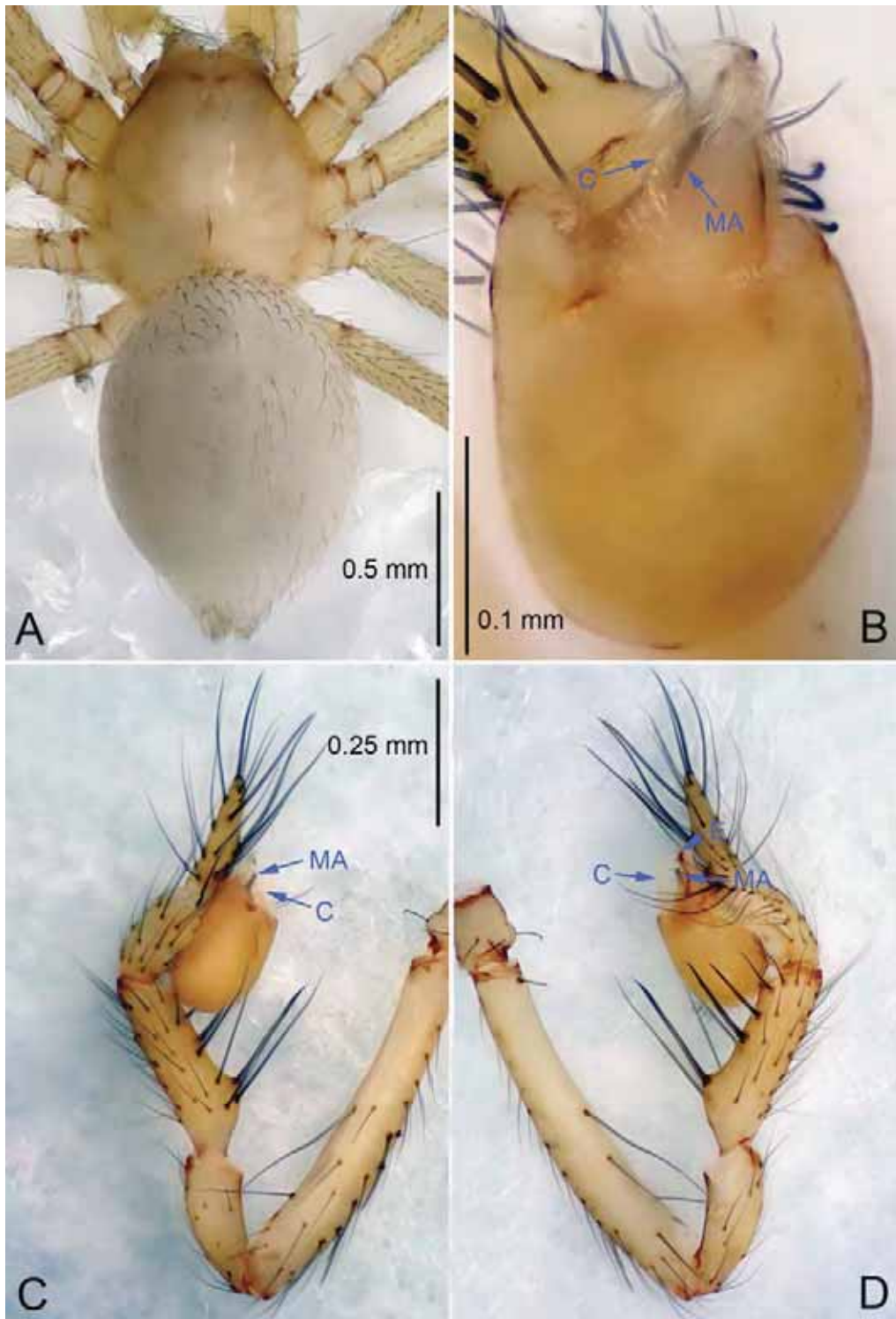
***Leptonetela lujia* Wang & Li sp. nov.**  
**Figs 50–51, 97**

**Type material. Holotype:** male (IZCAS), Wuming Cave, 26.48°N, 107.54°E, Lujia Bridge, Gubin, Xingshan Town, Majiang County, Kaili City, Guizhou Province, China, 29 November 2011, H. Chen & Z. Zha leg. **Paratypes:** 1 male and 2 females, same data as holotype.

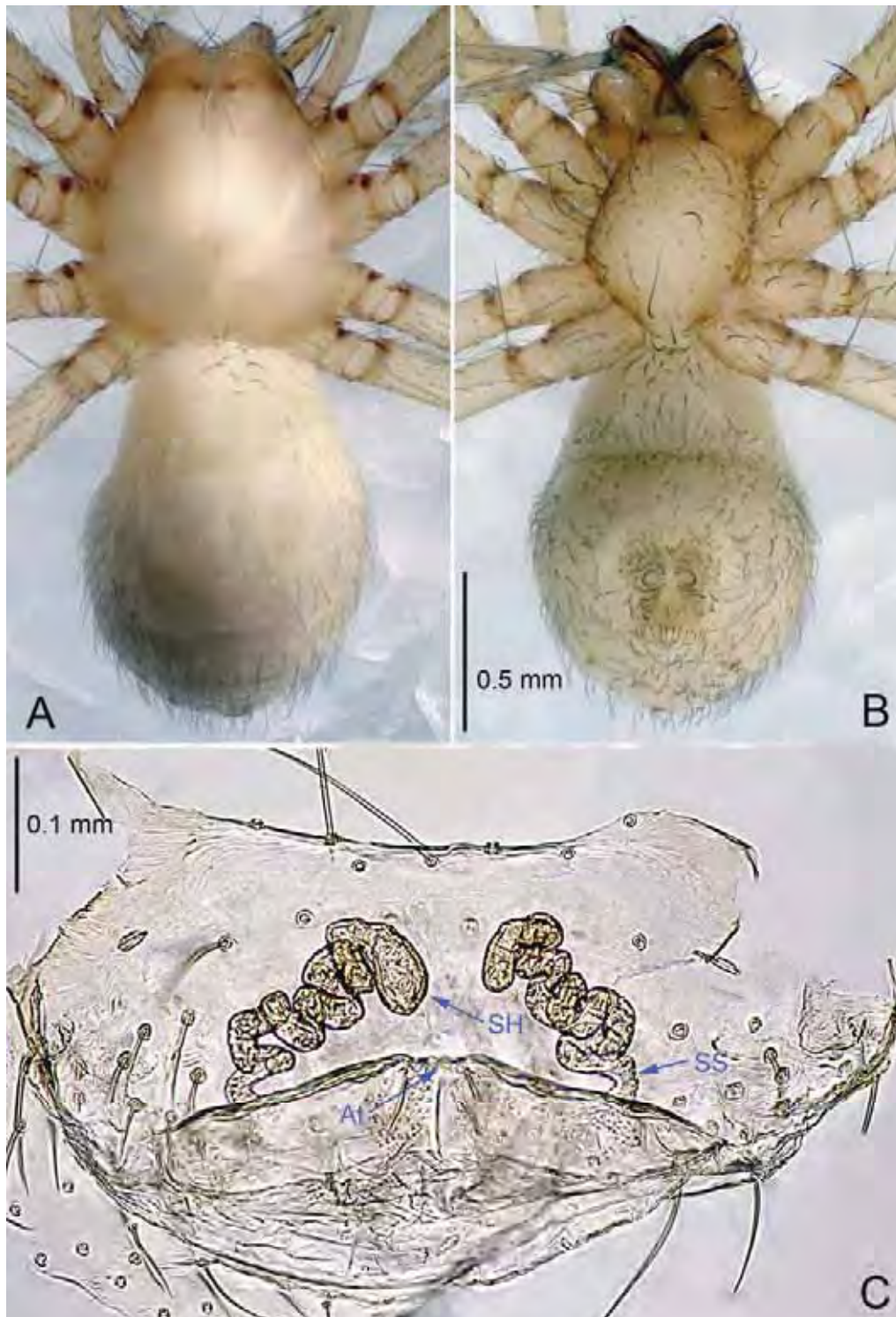
**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. jinsha* Lin et Li, 2010, *L. quinquespinata* (Chen & Zhu, 2008), *L. xinhua* Wang & Li sp. nov. and *L. gubin* Wang & Li sp. nov. but can be distinguished by the male pedipalpal tibia with 4 long setae prolaterally, 5 slender spines retrolaterally, with I spine longest, II III spines equally length (Fig. 50D), conductor thin, triangular (Fig. 50B), (tibia with 3 long setae prolaterally, 1 long setae and 5 spines retrolaterally, with I spine strongest, tip asymmetrically bifurcated, conductor broad, distal edge wavy line-shaped in *L. jinsha*; tibia with 3 long setae prolaterally, 6 slender spines retrolaterally, with I spine longest, conductor semicircular in *L. quinquespinata*; embolus bifurcated, tibia with 5 slender spines prolaterally, 5 slender spines retrolaterally, conductor triangular in *L. xinhua* Wang & Li sp. nov.; tibia with 4 slender spines prolaterally, 5 slender spines retrolaterally, I, II spines equally length, cymbium with 2 long curved spines on earlobe-shaped process retrolaterally, conductor semicircle in *L. gubin* Wang & Li sp. nov.); from *L. gubin* and *L. quinquespinata* by the base of median apophysis slightly swollen (Fig. 50B) (base of median apophysis distinctly swollen, 4 times the width of tip in *L. gubin* Wang & Li sp. nov.; 3 times in *L. quinquespinata*).

**Description. Male (holotype).** Total length 1.72 (Fig. 50A). Carapace 0.90 long, 0.85 wide. Opisthosoma 0.87 long, 0.88 wide. Carapace yellow. Ocular area with a pair of setae, eye

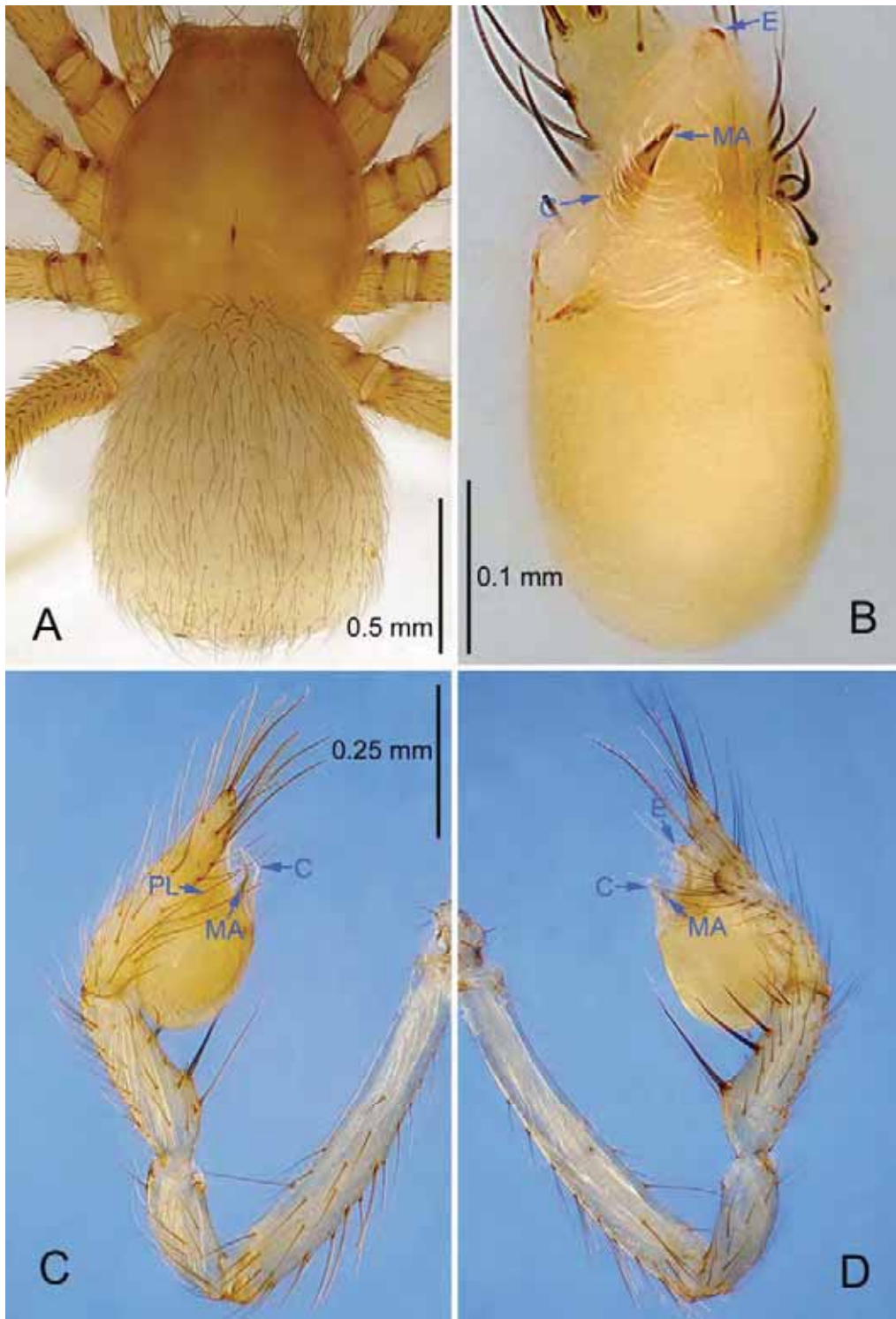


**FIGURE 48** *Leptonetela gubin* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



**FIGURE 49** *Leptonetela gubin* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.





**FIGURE 50** *Leptonetela lujia* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



**FIGURE 51** *Leptonetela lujia* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

absent. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.12 high. Opisthosoma yellowish, ovoid. Leg measurements: I 7.75 (2.10, 0.37, 2.23, 1.78, 1.27); II 6.97 (1.96, 0.37, 1.86, 1.62, 1.16); III 5.73 (1.62, 0.32, 1.50, 1.32, 0.97); IV 7.15 (2.02, 0.30, 1.92, 1.80, 1.11). Male pedipalp (Figs 50C–D): tibia with 4 long spines prolaterally, 5 large spines retrolaterally, with I spine longest, II III spines equally length. Cymbium not constricted medially, earlobe-shaped process distinct. Embolus triangular, prolateral lobe indistinct. Median apophysis index finger like. Conductor thin, triangular in ventral view (Fig. 50B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 1.70 (Figs 51A–B). Carapace 0.85 long, 0.75 wide. Opisthosoma 0.87 long, 0.83 wide. Clypeus 0.12 high. Leg measurements: I 6.89 (1.85, 0.37, 1.97, 1.50, 1.20); II 5.94 (1.67, 0.35, 1.62, 1.25, 1.05); III 5.30 (1.48, 0.35, 1.38, 1.22, 0.87); IV 6.47 (1.86, 0.37, 1.70, 1.46, 1.08). Vulva (Fig. 51C): spermathecae coiled, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela xinhua* Wang & Li sp. nov.**  
Figs 52–53, 97

**Type material.** **Holotype:** male (IZCAS), nameless Cave, 27.85N, 111.31E, Caojia Town, Xinhua County, Loudi City, Hunan Province, China, 24 March 2016, Y. Li & Z. Chen leg.  
**Paratypes:** 3 males and 2 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. jinsha* Lin & Li, 2010, *L. quinquespinata* (Chen & Zhu, 2008), *L. lujia* Wang & Li sp. nov., and *L. gubin* Wang & Li sp. nov., but can be distinguished by the embolus bifurcated, male pedipalpal tibia with 5 slender spines prolaterally, 5 slender spines retrolaterally, conductor triangular (Fig. 52D), (tibia with 4 long setae prolaterally, 5 slender spines retrolaterally, with I spine longest, II III spines equally length, conductor thin, triangular in *L. lujia* Wang & Li sp. nov.; tibia with 3 long setae prolaterally, 1 long setae and 5 spines retrolaterally, with I spine strongest, tip asymmetrically bifurcated, conductor broad, distal edge wavy line-shaped in *L. jinsha*; tibia with 3 long setae prolaterally, 6 slender spines retrolaterally, with I spine longest, conductor semicircular in *L. quinquespinata*; tibia with 4 slender spines prolaterally, 5 slender spines retrolaterally, with I, II spines equally length, cymbium with 2 long curved spines on earlobe-shaped process retrolaterally, conductor semicircle in *L. gubin* Wang & Li sp. nov.); from *L. gubin* and *L. quinquespinata* by the base of median apophysis slightly swollen (Fig. 52B) (base of median apophysis distinctly swollen, 4 times the width of tip in *L. gubin* Wang & Li sp. nov.; 3 times in *L. quinquespinata*).

**Description. Male (holotype):** total length 1.78 (Fig. 52A). Prosoma 0.85 long, 0.71 wide. Opisthosoma 0.94 long, 0.73

wide. Prosoma yellowish. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, brown. Cervical grooves and radial furrows indistinct. Clypeus 0.14 high, slightly sloped anteriorly. Opisthosoma pale brown, ovoid, covered with short hairs, lacking distinctive pattern. Sternum and legs yellowish. Leg measurements: I 5.39 (1.52, 0.28, 1.58, 1.20, 0.81); II 4.37 (1.28, 0.29, 1.28, 1.01, 0.51); III 3.84 (1.03, 0.25, 0.98, 0.95, 0.63); IV 5.15 (1.36, 0.27, 1.50, 1.23, 0.79). Leg formula: I-IV-II-III. Male pedipalp (Figs 52C–D): tibia with 5 slender spines prolaterally, 5 slender spines retrolaterally. Cymbium with an earlobe-shaped process retrolaterally. Embolus bifurcated, prolateral lobe triangular. Median apophysis tongue shaped in prolaterally view. Conductor triangular in ventral view (Fig. 52B).

**Female (one of the paratypes):** similar to male in color and general features, but with a larger body size and shorter legs. Total length 1.95 (Figs 53A–B). Prosoma 0.66 long, 0.53 wide. Opisthosoma 1.06 long, 0.86 wide. Clypeus 0.20 high. Leg measurements: I 4.60 (1.30, 0.27, 1.33, 0.99, 0.71); II 3.86 (1.11, 0.25, 1.01, 0.85, 0.64); III 3.34 (0.95, 0.24, 0.83, 0.76, 0.56); IV 4.54 (1.33, 0.26, 1.25, 1.03, 0.67). Vulva (Fig. 53C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Hunan).

***Leptonetela kangsa* Wang & Li sp. nov.**  
Figs 54–55, 97

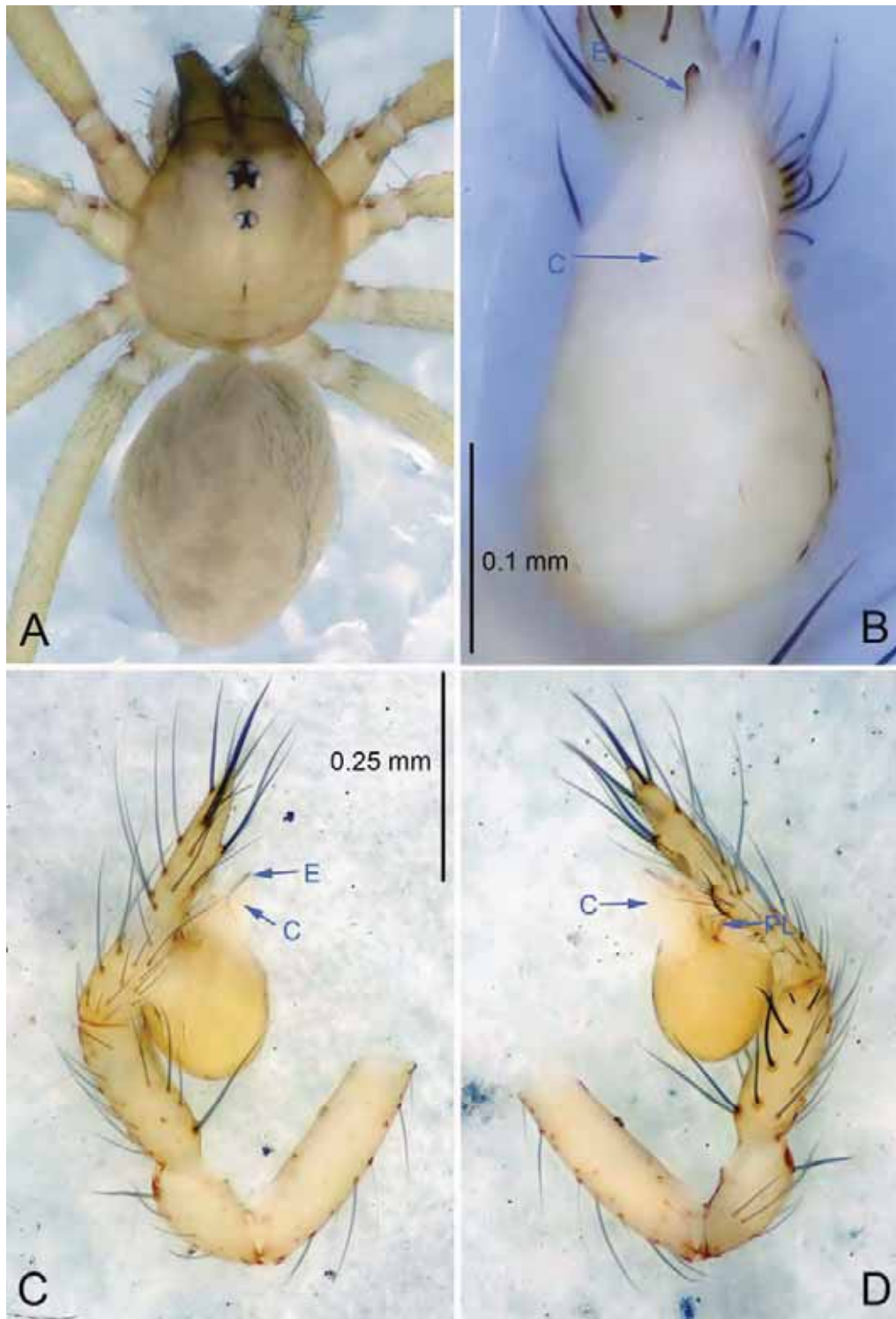
**Type material.** **Holotype:** male (IZCAS), Kangsagulie Cave, 26.79°N, 108.21°E, Datang, Geyi Town, Taijiang County, Kaili City, Guizhou Province, China, 5 Dec 2011, H. Chen & Z. Zha leg. **Paratypes:** 7 males and 6 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

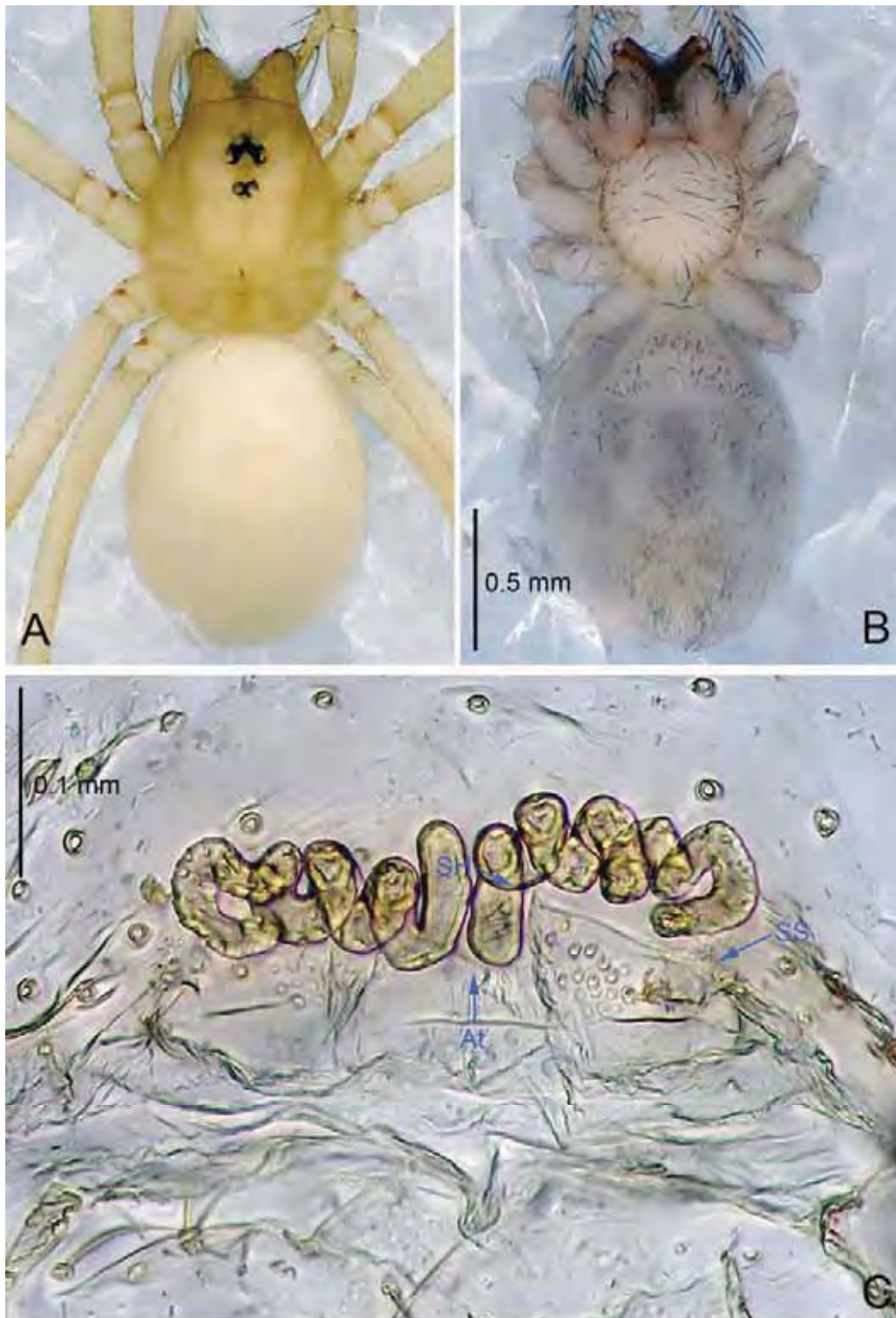
**Diagnosis.** This new species is similar to *L. shibingensis*, *L. wuming* Wang & Li sp. nov., but can be separated from *L. shibingensis* by the male pedipalpal tibial I spine distinct strong in *L. shibingensis* (Fig. 54D) *L. shibingensis*); from *L. wuming* Wang & Li sp. nov., by the tibia I spine located at the middle of tibia (tibia I spine located at the base of tibia in *L. wuming* Wang & Li sp. nov.); from *L. wuming* Wang & Li sp. nov. by the embolus with 1 basal tooth, conductor bamboo leaf-shaped (Fig. 54B) (embolus without tooth, conductor short, C tile-shaped in *L. wuming* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 2.07 (Fig. 54A). Carapace 0.85 long, 0.87 wide. Opisthosoma 1.25 long, 0.92 wide. Carapace yellow. Eyes six, PME reduced to white spots. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.12 high. Opisthosoma gray, ovoid. Leg measurements: I 9.04 (2.50, 0.37, 2.65, 2.10, 1.42); II 7.43 (2.10, 0.36, 2.05, 1.70, 1.22); III 6.23 (1.77, 0.37, 1.60, 1.47, 1.02); IV 8.09 (2.22, 0.35, 2.27, 2.00, 1.25). Male pedipalp (Figs 54C–D): tibia with 4 long setae prolaterally, 5 large spines retrolaterally, with I spine strong, located medially. Cymbium constricted medially, attaching an earlobe-shaped process

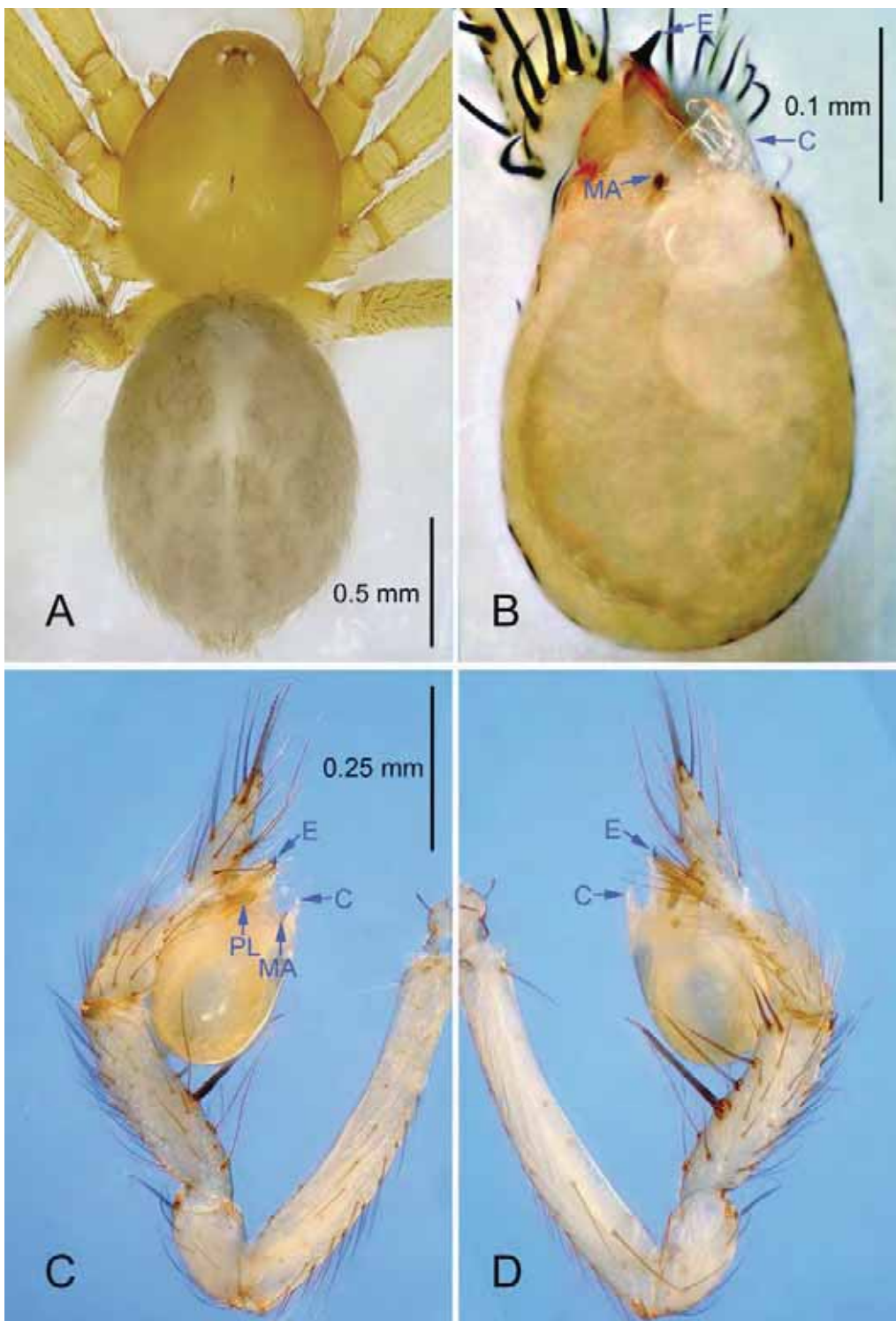




**FIGURE 52** *Leptonetela xinhua* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



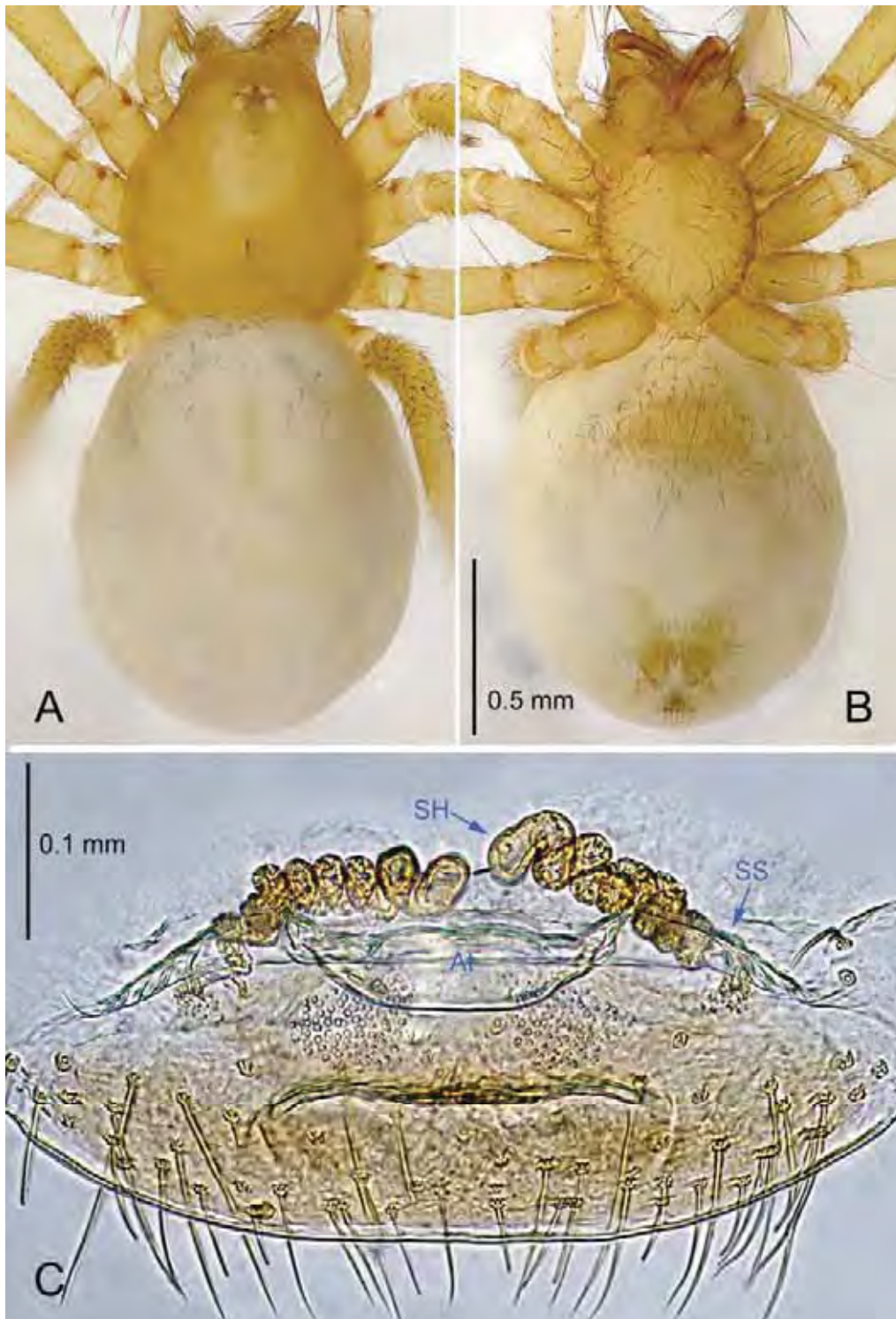
**FIGURE 53** *Leptonetela xinhua* sp. nov., one of paratype females  
 A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 54** *Leptonetela kangsa* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





**FIGURE 55** *Leptonetela kangsa* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

retrolaterally. Embolus triangular, bearing a basal tooth, prolateral lobe oval. Median apophysis index finger-like in prolaterally view, tip bifurcated. Conductor bamboo leaf-shaped in ventral view (Fig. 54B).

**Female (one of the paratypes).** Similar to male in color and general features, but smaller and with shorter legs. Total length 2.02 (Figs 55A–B). Carapace 0.72 long, 0.72 wide. Opisthosoma 1.27 long, 1.02 wide. Clypeus 0.15 high. Leg measurements: I 7.61 (2.07, 0.35, 2.25, 1.72, 1.22); II 6.23 (1.72, 0.35, 1.72, 1.37, 1.07); III 5.41 (1.62, 0.32, 1.35, 1.22, 0.90); IV 6.92 (1.80, 0.35, 2.00, 1.65, 1.12). Vulva (Fig. 55C): spermathecae coiled, atrium fusiformed

**Distribution.** China (Guizhou).

***Leptonetela wuming* Wang & Li sp. nov.**  
Figs 56–57, 97

**Type material. Holotype:** male (IZCAS), Wuming Cave, 25.43°N 105.62°E, Dabei Town, Zhenfeng County, Guizhou Province, China, 18 July 2012, H. Zhao leg. **Paratypes:** 2 males and 5 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. kangsa* Wang & Li sp. nov., and *L. shibingensis* but can be distinguished by on the male pedipalpal bulb embolus without basal tooth (Fig. 56B), (embolus with basal tooth in all above); from *L. kangsa* Wang & Li sp. nov. and *L. shibingensis* by the tibial I spine located at the base of tibia (Fig. 56D) (tibial I spine located medially in *L. kangsa* Wang & Li sp. nov. and *L. shibingensis*).

**Description. Male (holotype).** Total length 1.50 (Fig. 56A). Carapace 0.60 long, 0.45 wide. Opisthosoma 1.10 long, 0.60 wide. Carapace yellowish. Ocular area with a pair of setae, PLE, PME absent, ALE reduced to white spots. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.09 high. Opisthosoma yellowish, ovoid. Leg measurements: I 11.75 (3.12, 0.35, 3.40, 2.88, 2.00); II 9.35 (2.75, 0.35, 2.48, 2.49, 1.28); III 8.47 (2.80, 0.32, 2.30, 1.96, 1.09); IV 9.81 (2.81, 0.35, 2.72, 2.56, 1.37). Male pedipalp (Figs 56C–D): tibia with 3 long setae prolaterally, 5 large spines retrolaterally, with I spine strong, longest. Cymbium constricted medially, attaching an earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe oval. Median apophysis like victory gesture. Conductor bamboo leaf-shaped in ventral view (Fig. 56B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 3.02 (Figs 57A–B). Carapace 1.25 long, 0.90 wide. Opisthosoma 2.45 long, 1.38 wide. Clypeus 0.09 high. Leg measurements: I 8.67 (2.44, 0.33, 2.50, 2.01, 1.39); II 7.29 (2.10, 0.33, 2.08, 1.65, 1.13); III 7.22 (2.08, 0.35, 2.03, 1.63, 1.13); IV 7.30 (2.51, 0.33, 1.85, 1.56, 1.05). Vulva (Fig. 57C): spermathecae coiled, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela shanji* Wang & Li Wang & Li sp. nov.**  
Figs 58–59, 97

**Type material. Holotype:** male (IZCAS), Shanji Cave, 27.28°N, 107.82°E, Xiaguihua, Xiaosai Town, Yuqing County, Zunyi City, Guizhou Province, China, 15 August 2012, H. Zhao leg. **Paratypes:** 3 males and 3 females, same data as holotype; 2 females, Guanyin Cave, 27.32°N, 107.71°E, Hongjun, Longxi Town, Yuqing County, Zunyi City, Guizhou Province, China, 15 August 2012, H. Zhao leg; 3 females, Liangfeng Cave, 27.27°N, 107.76°E, Xiaosai Town, Yuqing County, Zunyi City, Guizhou Province, China, 14 August 2012, H. Zhao leg.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. digitata* Lin & Li, 2010, *L. hamata* Lin & Li, 2010 and *L. tetracantha* Lin & Li, 2010, but can be distinguished by the male pedipalpal tibial I spine strong, located medially (Fig. 58D) (tibial I spine slender, located at the base of tibia in all above); from *L. hamata* and *L. tetracantha* by the male pediapal tibial I spine asymmetrically bifurcated (Fig. 58D) (tibial I spine not bifurcated in *L. hamata*, and *L. tetracantha*); from *L. digitata* by the median apophysis not curved (median apophysis curved in *L. digitata*).

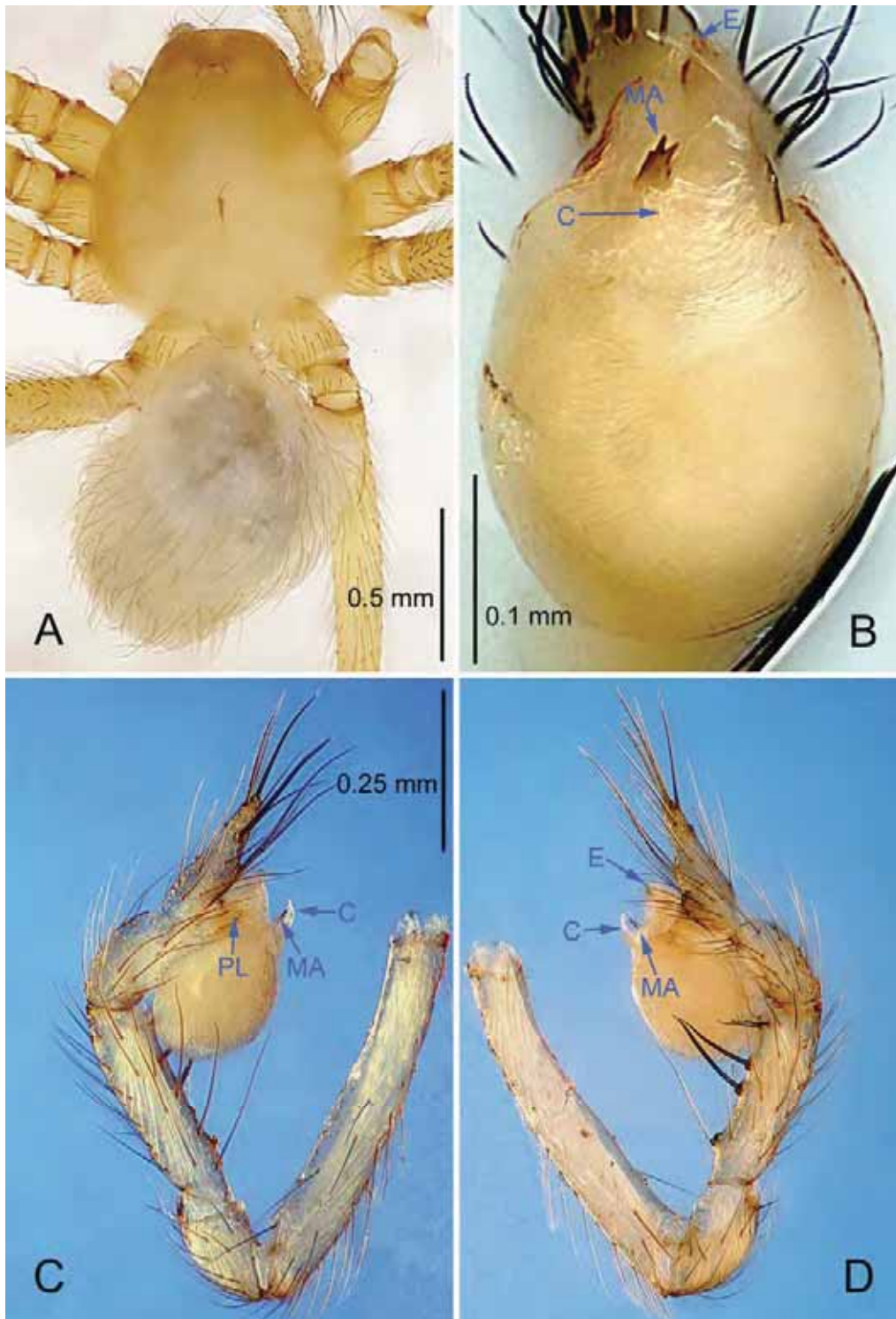
**Description. Male (holotype).** Total length 2.08 (Fig. 58A). Carapace 0.90 long, 0.95 wide. Opisthosoma 1.10 long, 0.83 wide. Carapace yellow. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma gray, ovoid. Leg measurements: I 8.54 (2.25, 0.38, 2.50, 2.03, 1.38); II 6.89 (1.88, 0.38, 1.88, 1.60, 1.15); III 5.70 (1.55, 0.35, 1.47, 1.35, 0.98); IV 7.59 (2.03, 0.38, 2.13, 1.88, 1.17). Male pedipalp (Figs 58C–D): tibia with 4 long spines prolaterally, 5 spines retrolaterally, with I spine strong, asymmetrically bifurcated and located at the base of tibia. Cymbium constricted medially, attaching an earlobe-shaped process retrolaterally. Embolus triangular, bearing a small basal tooth, prolateral lobe oval. Median apophysis index finger like in prolaterally view, tapering. Conductor bamboo leaf-shaped in ventral view (Fig. 58B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.40 (Figs 59A–B). Carapace 0.95 long, 0.88 wide. Opisthosoma 1.38 long, 1.25 wide. Clypeus 0.13 high. Leg measurements: I 7.97 (2.13, 0.38, 2.38, 1.75, 1.33); II 6.36 (1.75, 0.35, 1.75, 1.38, 1.13); III 5.31 (1.45, 0.35, 1.38, 1.25, 0.88); IV 7.18 (1.95, 0.38, 2.00, 1.70, 1.15). Vulva (Fig. 59C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Guizhou).

***Leptonetela xiaoyan* Wang & Li sp. nov.**  
Figs 60–61, 97

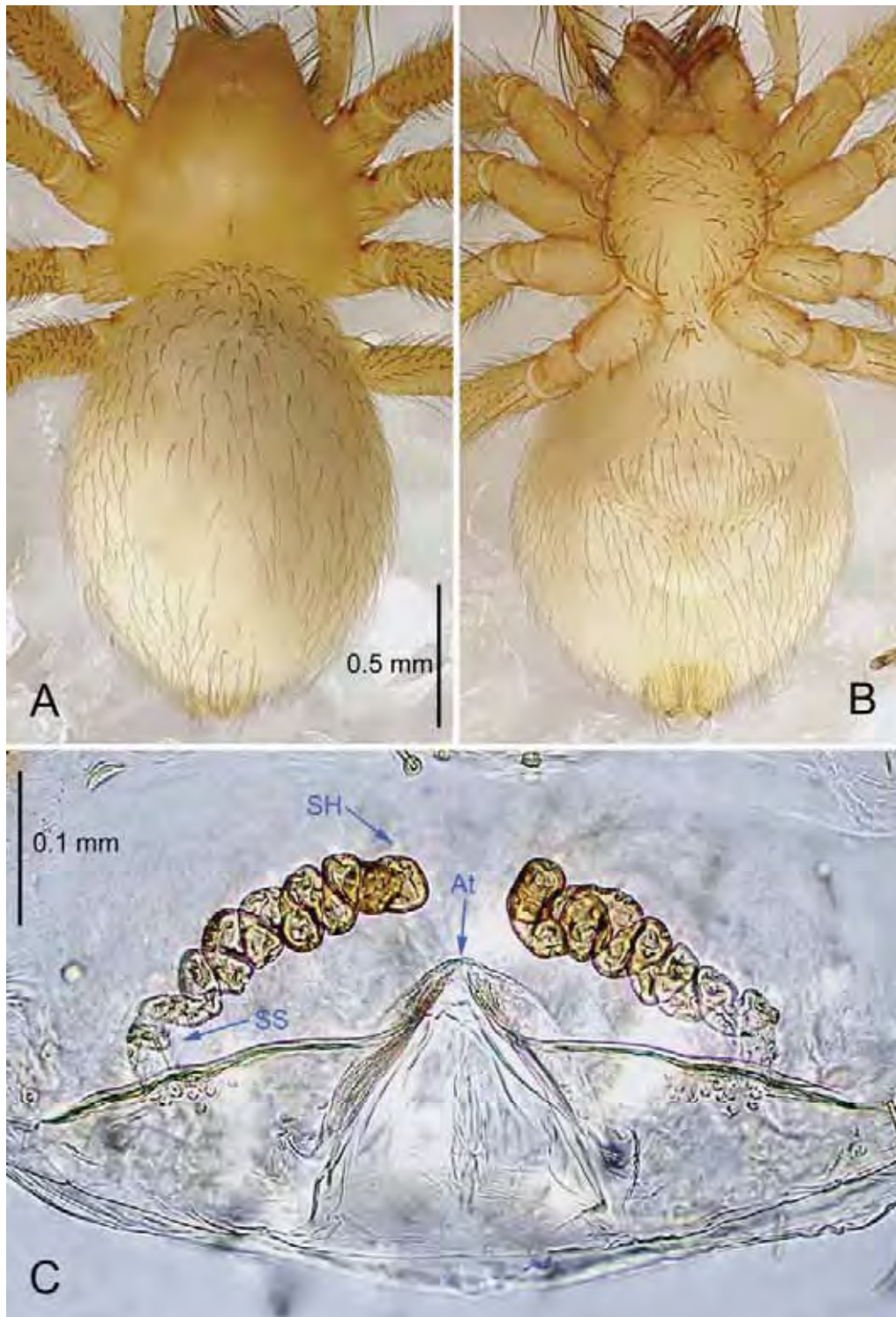
**Type material. Holotype:** male (IZCAS), Gejiaxiaoyan Cave, 27.11°N, 105.24°E, Shanjiao, Zhuchang Town, Bijie City, Guizhou



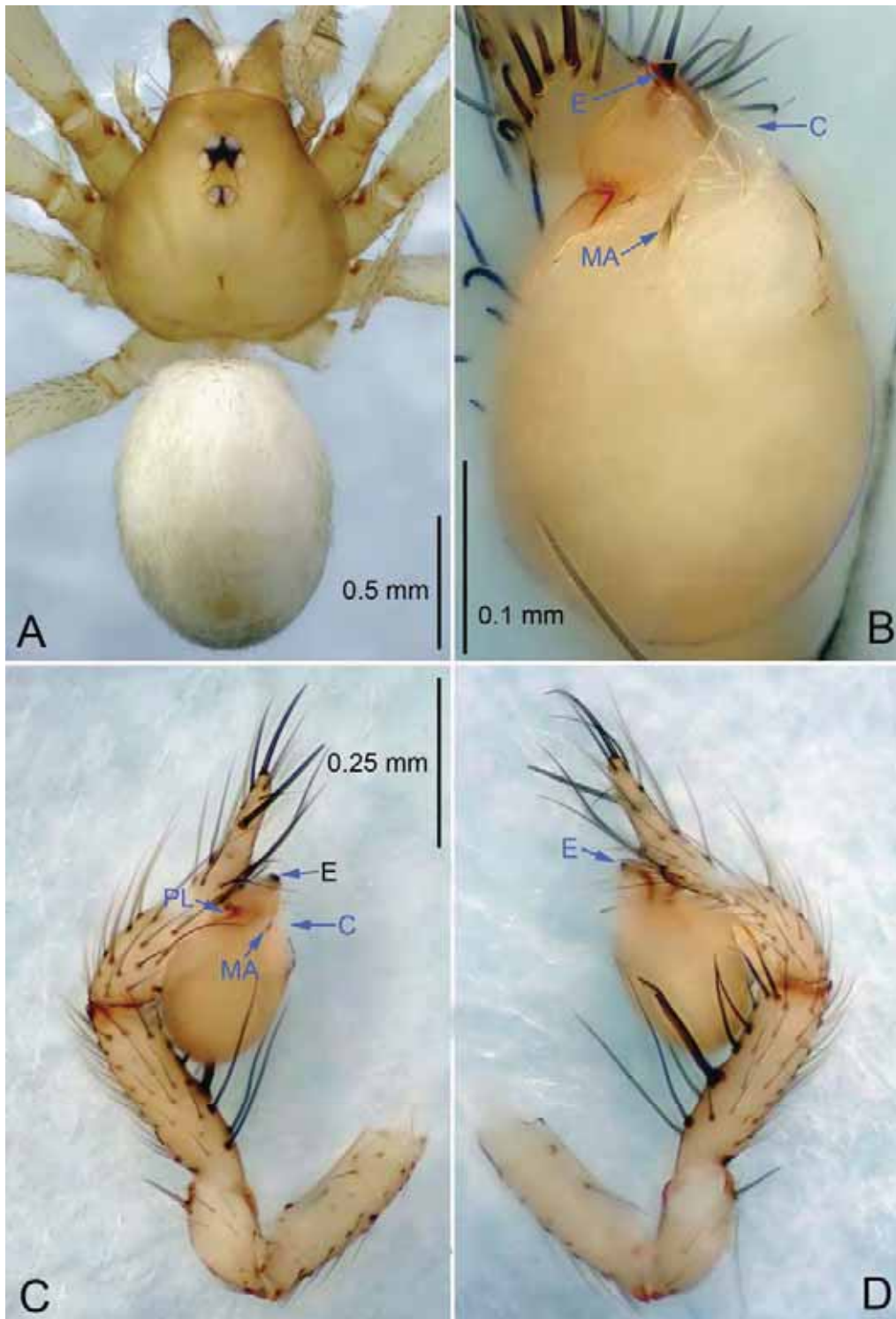
**FIGURE 56** *Leptonetela wuming* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





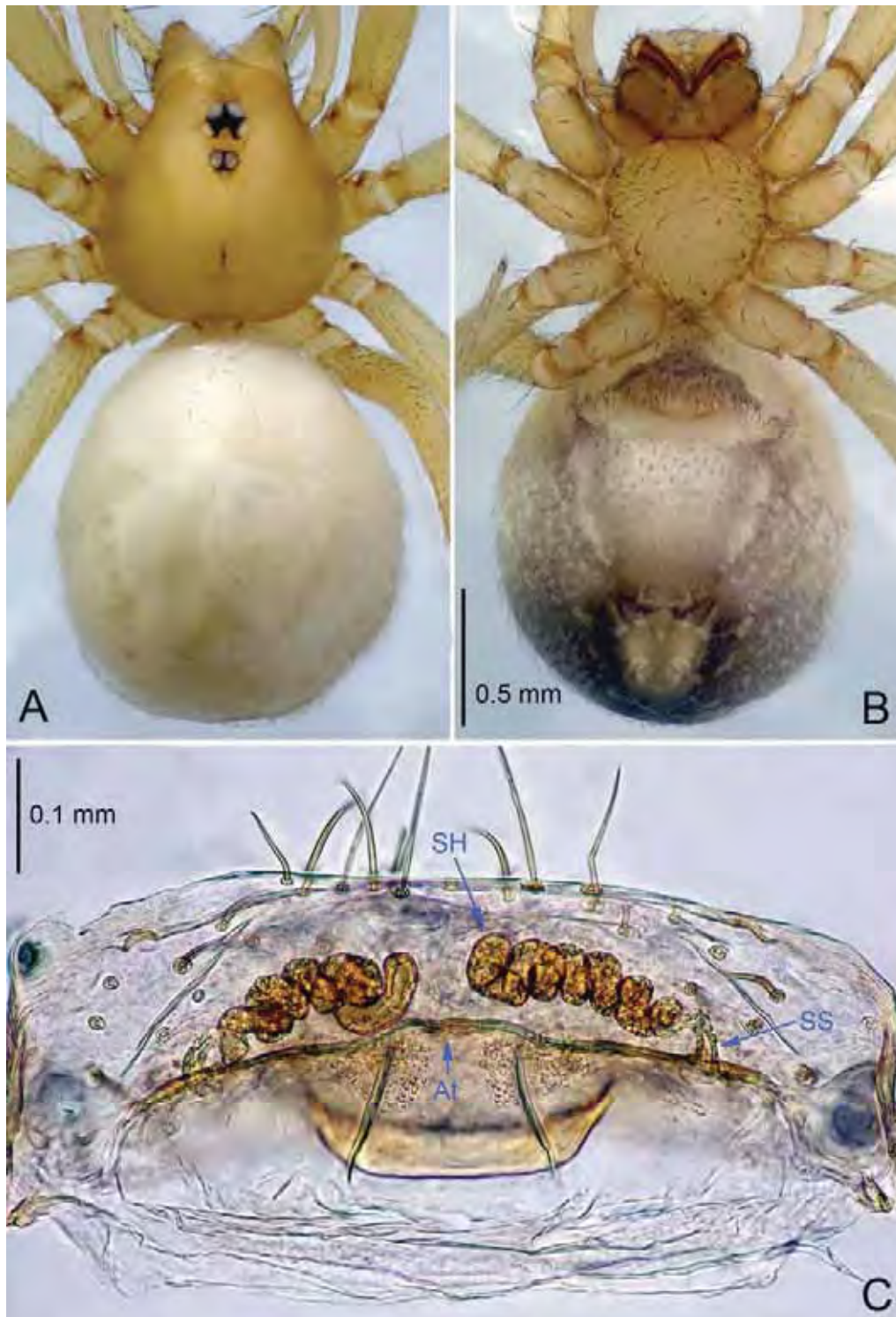
**FIGURE 57** *Leptonetela wuming* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 58** *Leptonetela shanji* sp. nov., holotype male

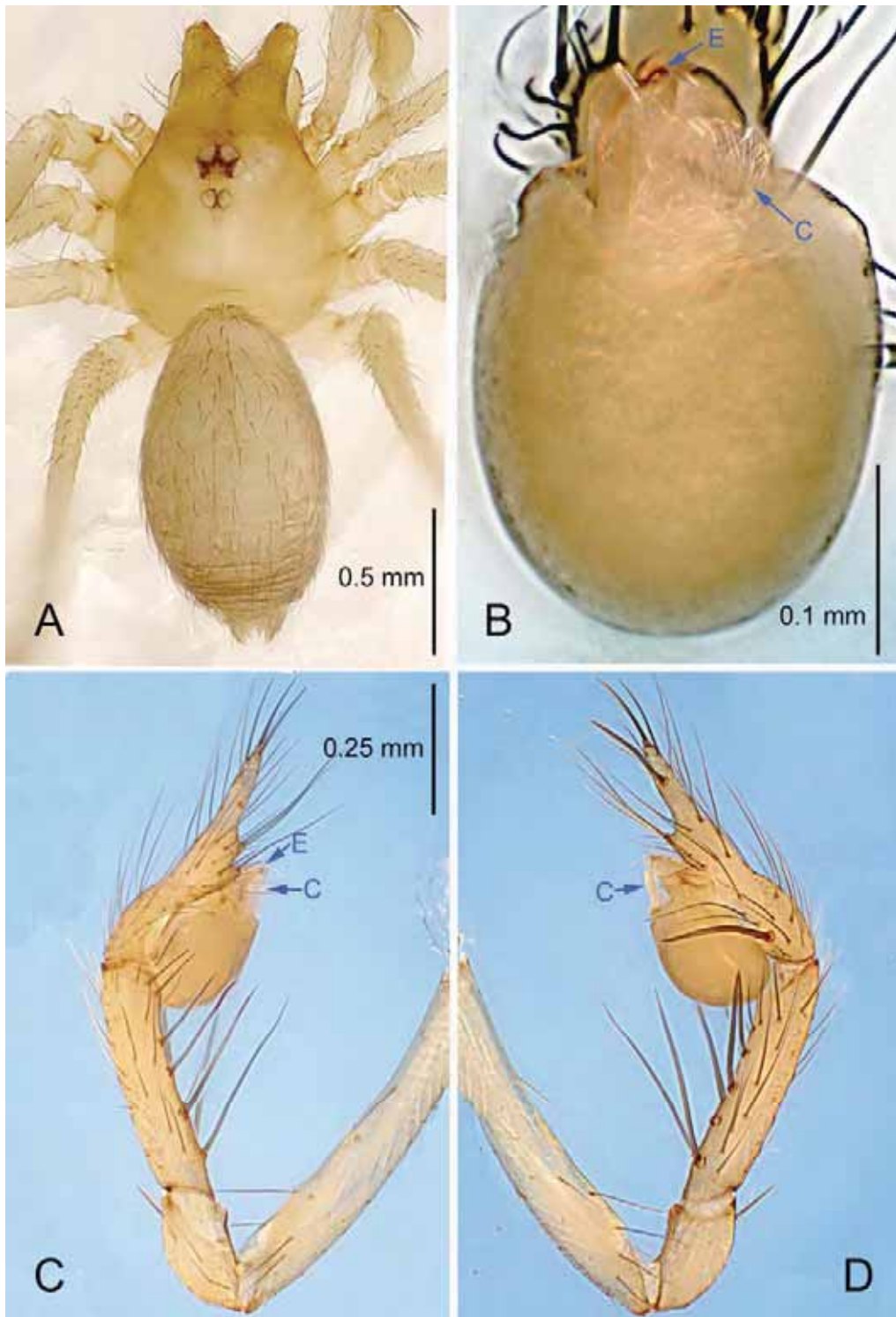
A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





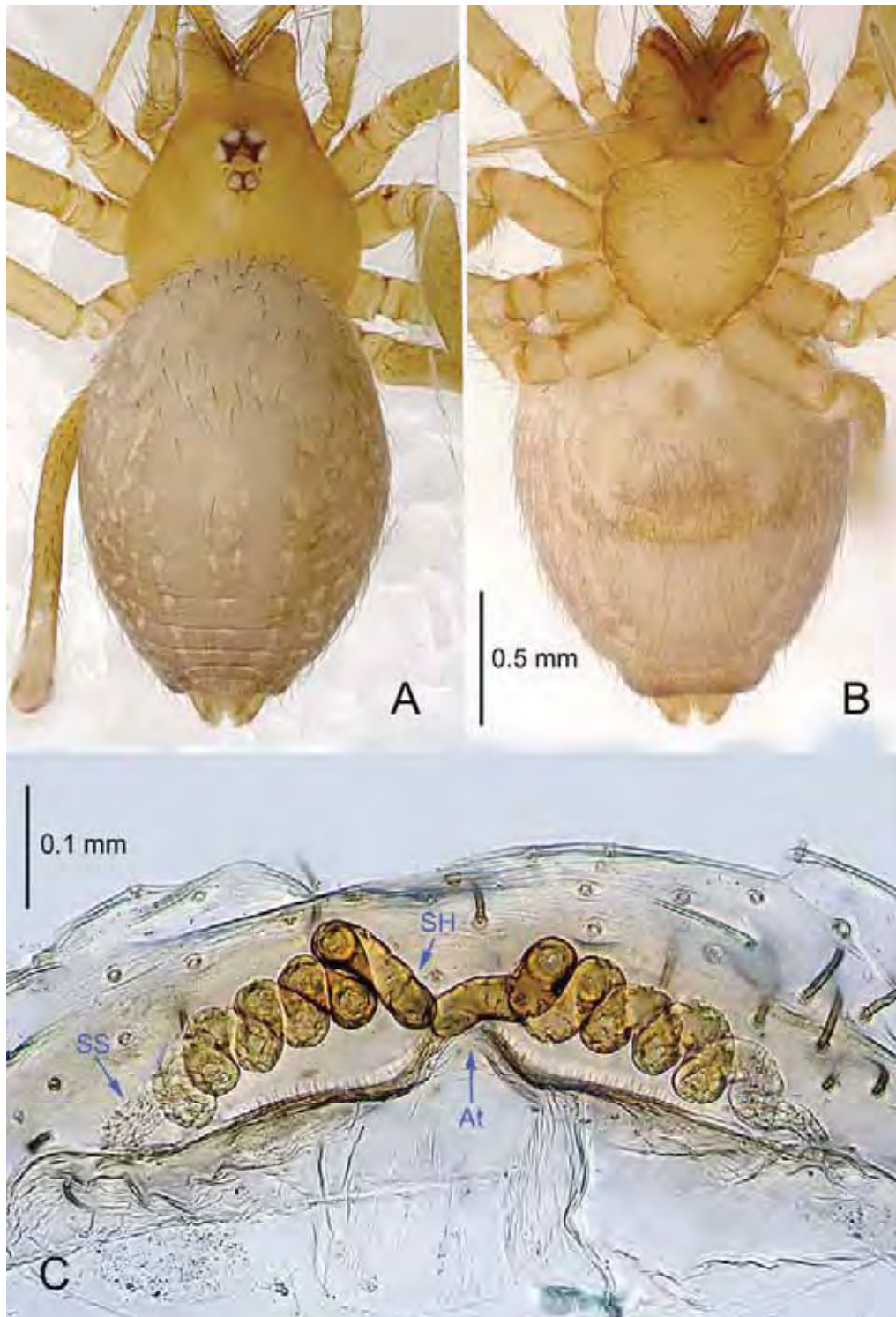
**FIGURE 59** *Leptonetela shanji* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.





**FIGURE 60** *Leptonetela xiaoyan* sp. nov., holotype male

A: Habitus, dorsal view; B: Right palpal bulb, ventral view; C: Right palp, retrolateral view; D: Right palp, prolateral view.



**FIGURE 61** *Leptonetela xiaoyan* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

Province, China, 27 January 2011, H. Chen & Z. Zha leg.  
**Paratypes:** 2 males and 6 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. curvispinosa* Lin & Li, 2010, but can be distinguished by the male pedipalpal tibia with 4 large spines prolaterally, 6 large spines retrolaterally (Fig. 60D), median apophysis not sclerotized, little finger-shaped in prolaterally view, conductor broad C tile-shaped (Fig. 60B) (tibia with 3 large spines prolaterally, 5 large spines retrolaterally, median apophysis absent, conductor reduced in *L. curvispinosa*).

**Description. Male (holotype).** Total length 1.67 (Fig. 60A). Carapace 0.88 long, 0.80 wide. Opisthosoma 1.15 long, 0.75 wide. Carapace yellowish. Eyes six. Median groove, cervical grooves and radial furrows indistinct. Clypeus 0.10 high. Opisthosoma yellowish, ovoid. Leg measurements: I 9.96 (2.84, 0.35, 2.80, 2.40, 1.57); II 7.09 (2.02, 0.32, 2.00, 1.60, 1.15); III 6.38 (1.77, 0.32, 1.82, 1.47, 1.00); IV 7.89 (2.25, 0.35, 2.27, 1.85, 1.17). Male pedipalp (Figs 60C–D): tibia with 4 spines prolaterally and 6 spines retrolaterally, with I spine longest. Cymbium not constricted, prolaterally with one curved spine on the base. Embolus triangular, prolateral lobe oval. Median apophysis slightly sclerotized, fingerlike in prolaterally view. Conductor broad, C tile-shaped in ventral view (Fig. 60B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.12 (Figs 61A–B). Carapace 0.82 long, 0.82 wide. Opisthosoma 1.47 long, 1.12 wide. Clypeus 0.15 high. Leg measurements: I 9.79 (2.62, 0.35, 3.03, 2.22, 1.57); II 6.84 (1.90, 0.30, 1.97, 1.47, 1.20); III 5.53 (1.52, 0.32, 1.52, 1.27, 0.90); IV 7.36 (2.07, 0.35, 1.97, 1.72, 1.25). Vulva (Fig. 61C): spermathecae coiled, atrium triangular, anterior margin of atrium covered with short hairs.

**Distribution.** China (Guizhou).

***Leptonetela huoyan* Wang & Li sp. nov.**  
Figs 62–63, 97

**Type material. Holotype:** male (IZCAS), Heyuantou nameless Cave, 29.25°N, 109.35°E, Huoyan Street, Guitang Dam Town, Longshan County, Hubei Province, China, 15 January 2014, Y. Li & Y. Lin leg. **Paratypes:** 1 male and 2 females, same data as holotype; 1 male and 4 females, nameless Cave, 29.61°N, 109.17°E, Jieping, Xianfeng County, Enshi Tujia and Miao Autonomous Prefecture, Hubei Province, China, 17 January 2014, Y. Li & Y. Lin leg.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. anshun* Lin & Li, 2010, *L. chenjia* Wang & Li sp. nov., but can be distinguished by on the male pedipalpal bulb median apophysis slightly sclerotized, index finger like, conductor broad, semicircular (Fig 62B) (median apophysis absent in *L. anshun*, and *L. chenjia*

Wang & Li sp. nov.; tip of conductor bifurcated in *L. anshun*, conductor reduced in *L. chenjia* Wang & Li sp. nov.); from *L. anshun* by the tibial I spine slender (Fig 62D) (tibial I spine strong, tip bifurcated in *L. anshun*).

**Description. Male (holotype).** Total length 2.25 (Fig 62A). Carapace 0.88 long, 0.83 wide. Opisthosoma 1.50 long, 0.92 wide. Carapace yellow. Eye absent. Median groove, cervical groove and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma gray, ovoid. Leg measurements: I 8.90 (2.53, 0.40, 2.57, 2.00, 1.40); II 7.69 (2.38, 0.40, 2.13, 1.65, 1.13); III 6.51 (2.00, 0.38, 1.75, 1.50, 0.88); IV 7.73 (2.25, 0.40, 2.15, 1.78, 1.15). Male pedipalp (Figs 62C–D): tibia with 4 long setae prolaterally, 1 long seta and 5 spines retrolaterally, with I spine longest, far apart from others, the rest spines concentrated distally. Cymbium constricted medially, attaching an earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe absent. Median apophysis slightly sclerotized, index finger like. Conductor broad, semicircular in ventral view (Fig. 62B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.53 (Figs 63A–B). Carapace 0.93 long, 0.82 wide. Opisthosoma 1.63 long, 1.38 wide. Clypeus 0.15 high. Leg measurements: I 8.26 (2.38, 0.38, 2.32, 1.88, 1.30); II 7.28 (2.05, 0.35, 2.00, 1.63, 1.25); III 6.47 (1.93, 0.35, 1.62, 1.47, 1.10); IV 7.54 (2.20, 0.38, 2.08, 1.75, 1.13). Vulva (Fig. 63C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Hubei).

***Leptonetela liuguan* Wang & Li sp. nov.**  
Figs 64–65, 97

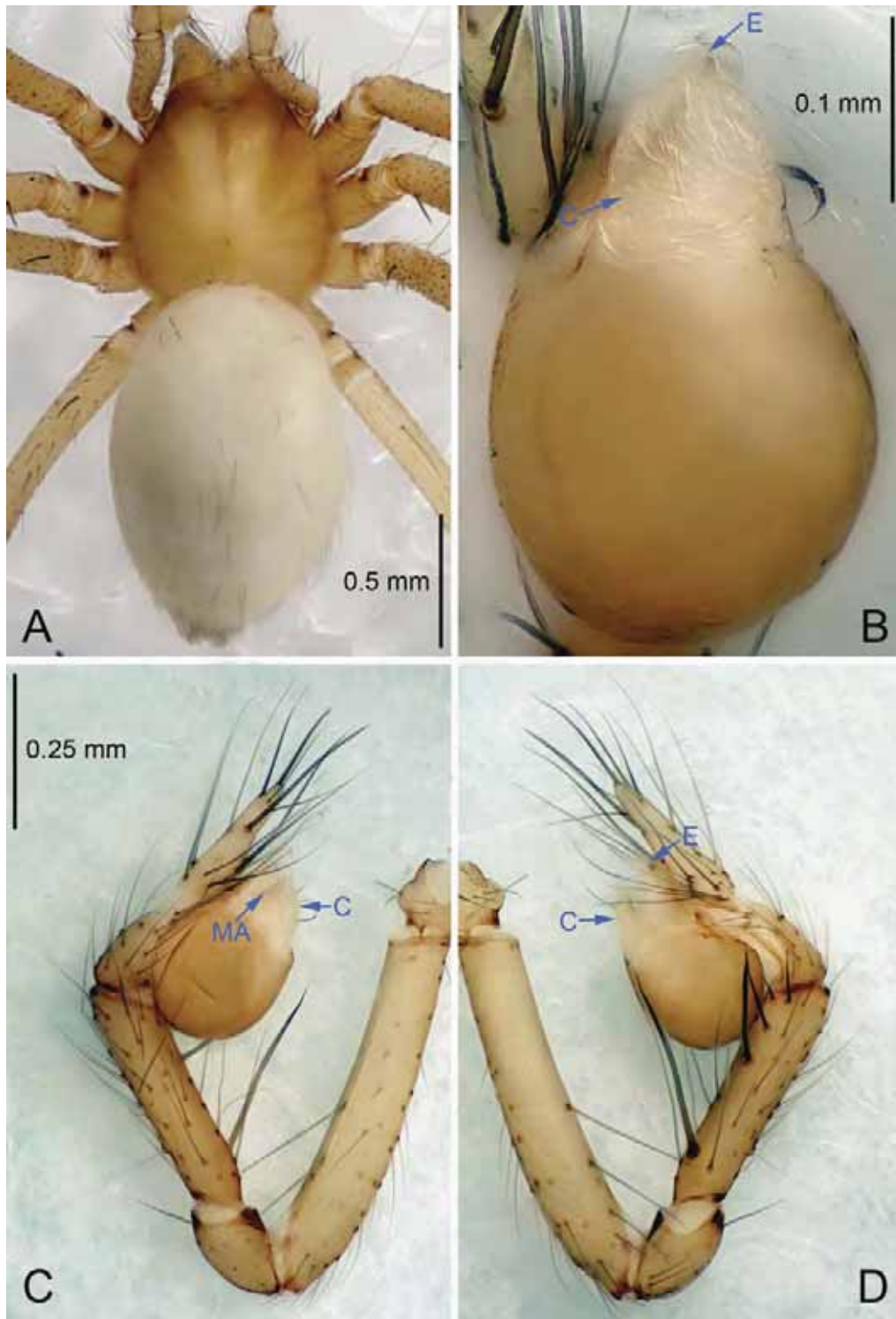
**Type material. Holotype:** male (IZCAS), Liuguan Cave, 26.15°N, 106.46°E, Mengqiu, Baiyunshan Town, Changshun County, Guizhou Province, China, 23 December 2010, Z. Zha & Z. Chen leg. **Paratypes:** 2 female, same data as holotype; 1 male, Fenghuang Cave, 26.09°N, 106.39°E, Shenglian, Zhonghuo Town, Changshun County, Guizhou Province, China, 23 December 2010, Z. Zha & Z. Chen leg.

**Etymology.** The specific name refers to the type locality; noun.

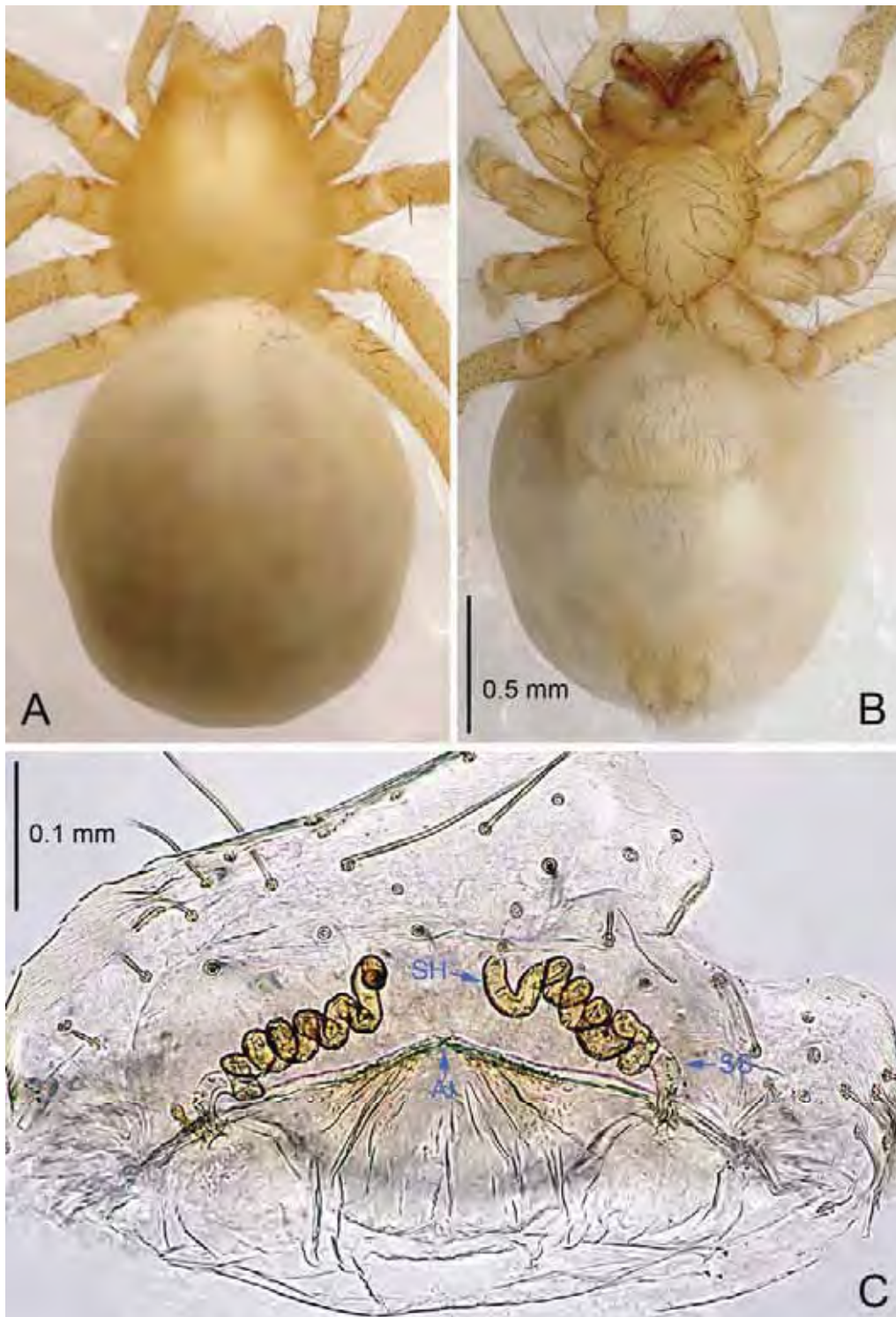
**Diagnosis.** This new species is similar to *L. penevi* Wang & Li, 2016, *L. changtu* Wang & Li sp. nov. but can be distinguished by on the male pedipalpal bulb median apophysis long, and half the length of bulb (Fig. 64B) (median apophysis short, 1/5 the length of bulb in *L. palmate*, and *L. changtu* Wang & Li sp. nov.); male pedipalpal tibia spines slender, equally strong (Fig. 64D) (tibial I II spines equally strong, stronger than others in *L. penevi*, tibial I II III spines equally strong, stronger than others in *L. changtu* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 1.88 (Fig. 64A). Carapace 0.73 long, 0.75 wide. Opisthosoma 1.10 long, 0.88 wide. Carapace yellowish. Eyes absent. Median groove, cervical

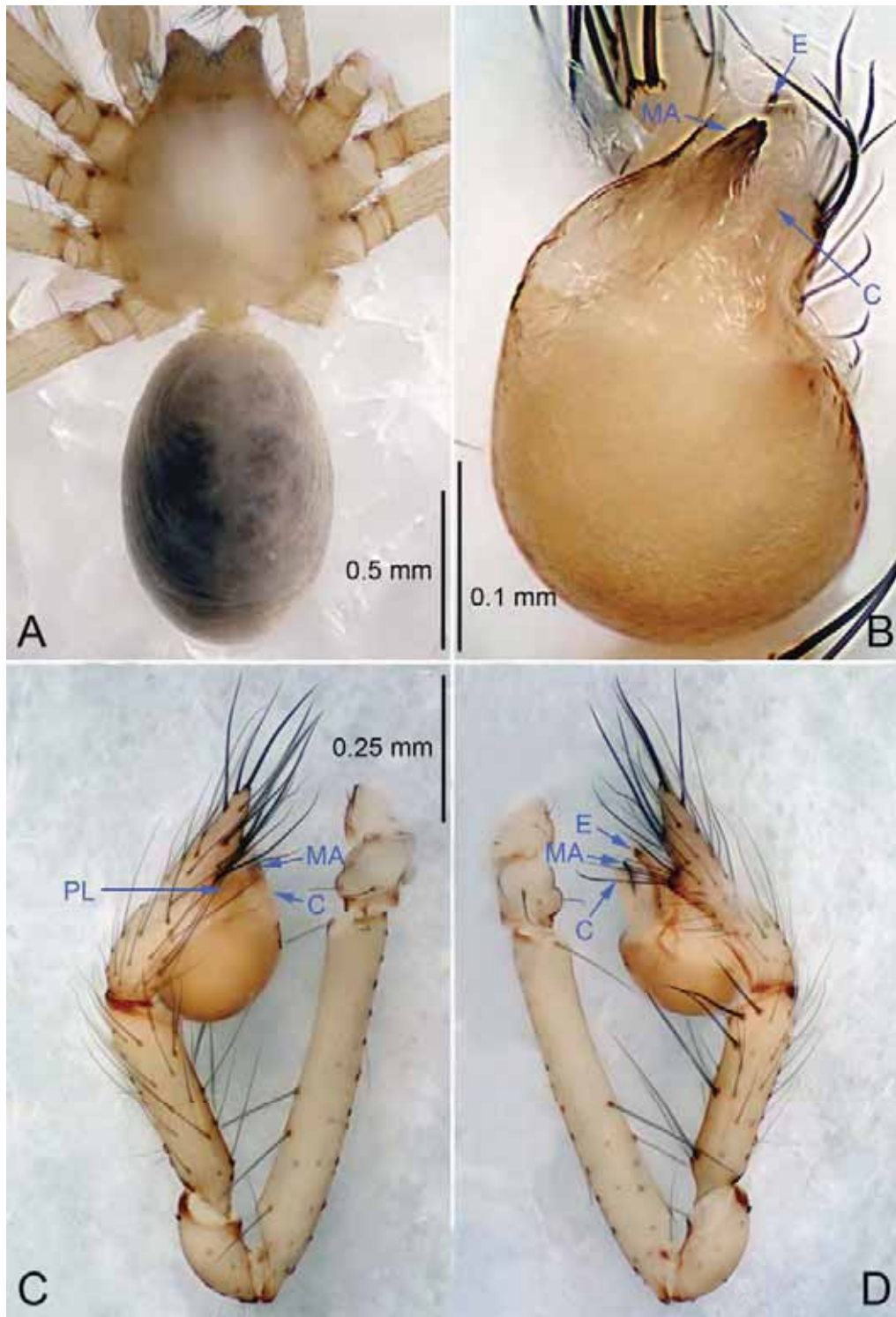




**FIGURE 62** *Leptonetela huoyan* sp. nov., holotype male  
A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



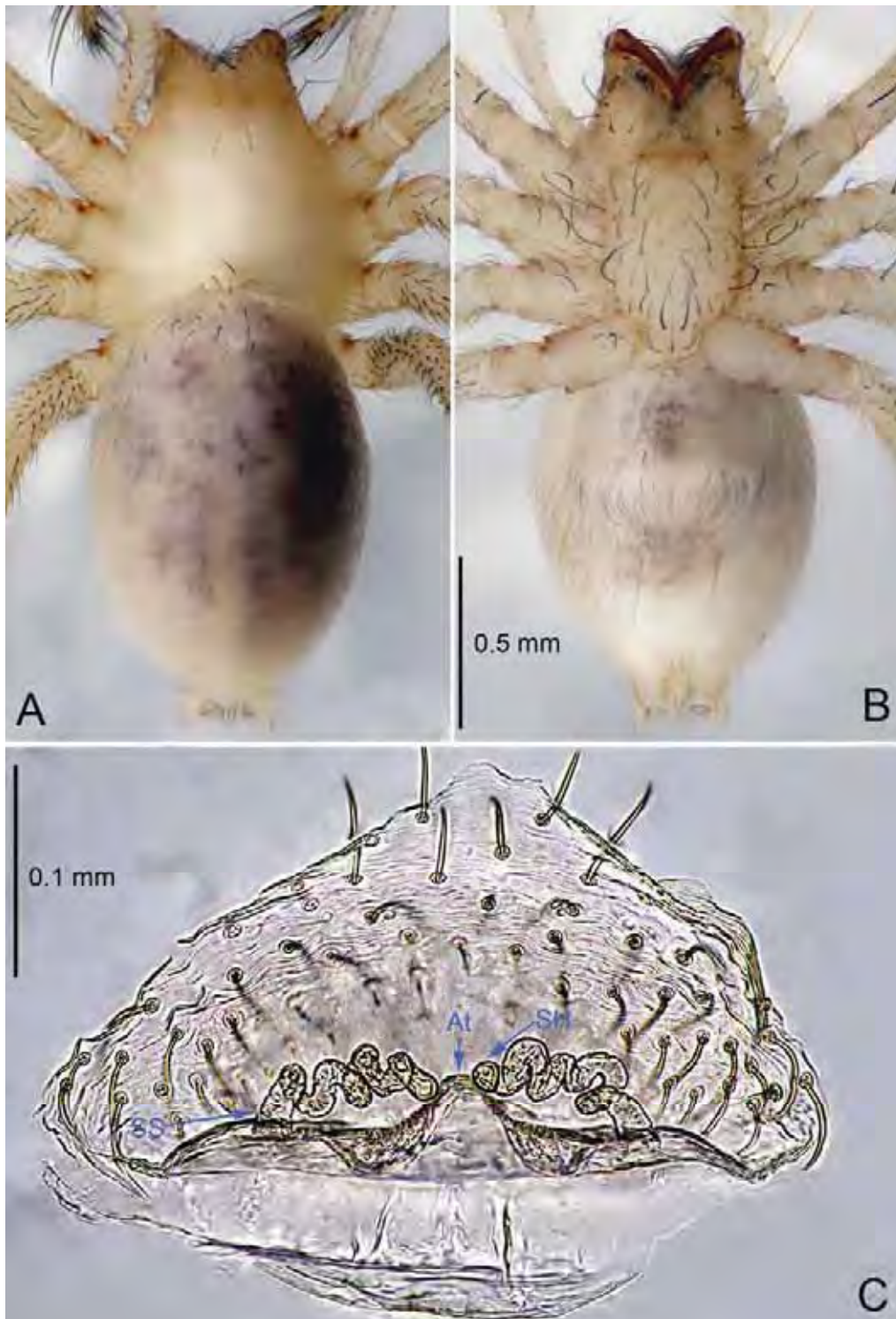
**FIGURE 63** *Leptonetela huoyan* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 64** *Leptonetela liuguan* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





**FIGURE 65** *Leptonetela liuguan* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma gray ovoid. Leg measurements: I 8.93 (2.38, 0.40, 2.64, 2.13, 1.38); II 7.84 (2.13, 0.40, 2.23, 1.78, 1.30); III 6.56 (1.75, 0.38, 1.80, 1.63, 1.00); IV 8.04 (2.25, 0.40, 2.18, 1.88, 1.33). Male pedipalp (Figs 64C–D): tibia with 3 long setae prolaterally, 5 slender spines retrolaterally, the spines slimsy, equally strong. Embolus triangular, prolateral lobe absent. Teeth of median apophysis reduced to sclerotized spots, conductor and median apophysis long, equally length and half the length of bulb (Fig. 64C).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.08 (Figs 65A–B). Carapace 0.75 long, 0.75 wide. Opisthosoma 1.50 long, 0.88 wide. Clypeus 0.15 high. Leg measurements: I 7.81 (2.13, 0.38, 2.30, 1.75, 1.25); II 6.89 (1.88, 0.38, 2.00, 1.50, 1.13); III 5.97 (1.70, 0.38, 1.63, 1.38, 0.88); IV 7.27 (2.03, 0.38, 2.05, 1.63, 1.18). Vulva (Fig. 65C): spermathecae coiled, atrium fusiformed, anterior margin of atrium wavy line-shaped.

**Distribution.** China (Guizhou).

***Leptonetela nanmu* Wang & Li sp. nov.**  
Figs 66–67, 94

**Type material. Holotype:** male (IZCAS), Nanmu Cave, 28.10°N, 110.08°E, Pushi Town, Luxi County, Hunan Province, China, 5 April 2016, Y. Li & Z. Chen leg. **Paratypes:** 3 males and 2 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. tianxingensis*, but can be distinguished by on the male pedipalpal bulb conductor longer than median apophysis (Fig. 66B) (conductor shorter than median apophysis in *L. tianxingensis*); male pedipalpal tibial III spine strong (Fig. 66D) (tibial III spine slender in *L. tianxingensis*).

**Description. Male (holotype):** total length 1.70 (Fig. 66A). Prosoma 0.81 long, 0.63 wide. Opisthosoma 0.94 long, 0.70 wide. Prosoma yellow. Eyes six, with a pair of setae on ocular area. Median groove needle-shaped, brown. Cervical grooves and radial furrows indistinct. Clypeus 0.14 high, slightly sloped anteriorly. Opisthosoma pale brown, ovoid, covered with short hairs, lacking distinctive pattern. Sternum and legs yellowish. Leg measurements: I 5.45 (1.42, 0.26, 1.62, 1.27, 0.88); II 4.76 (1.24, 0.25, 1.20, 1.27, 0.80); III 4.12 (1.03, 0.23, 1.02, 0.95, 0.89); IV 5.60 (1.36, 0.22, 1.48, 1.27, 1.27). Male pedipalp (Figs 66C–D): tibia with 5 spines retrolaterally, with I spine strongest, tip bifurcated, II spine slender, III spine strong. Embolus triangular, prolateral lobe oval. Median apophysis slightly sclerotized, thumb-shaped in ventral view. Conductor triangular, longer than median apophysis (Fig. 66B).

**Female (one of the paratypes):** similar to male in color and general features, but with a larger body size and longer legs.

Total length 1.98 (Figs 67A–B). Prosoma 0.88 long, 0.79 wide. Opisthosoma 1.12 long, 1.03 wide. Clypeus 0.20 high. Leg measurements: I 5.63 (1.52, 0.28, 1.68, 1.30, 0.85); II 4.86 (1.44, 0.27, 1.33, 0.86, 0.96); III 4.21 (1.31, 0.21, 1.06, 0.99, 0.64); IV 5.23 (1.47, 0.25, 1.50, 1.20, 0.81). Vulva (Fig. 67C): spermathecae coiled, atrium triangular.

**Distribution.** China (Hunan).

***Leptonetela changtu* Wang & Li sp. nov.**  
Figs 68–69, 97

**Type material. Holotype:** male (IZCAS), Changtu Cave, 27.14°N, 105.43°E, Honglin, Qianxi Town, Bijie County, Guizhou Province, China, 23 November 2011, Z. Zha & Z. Zha leg. **Paratypes:** 1 male and 10 females, same data as holotype.

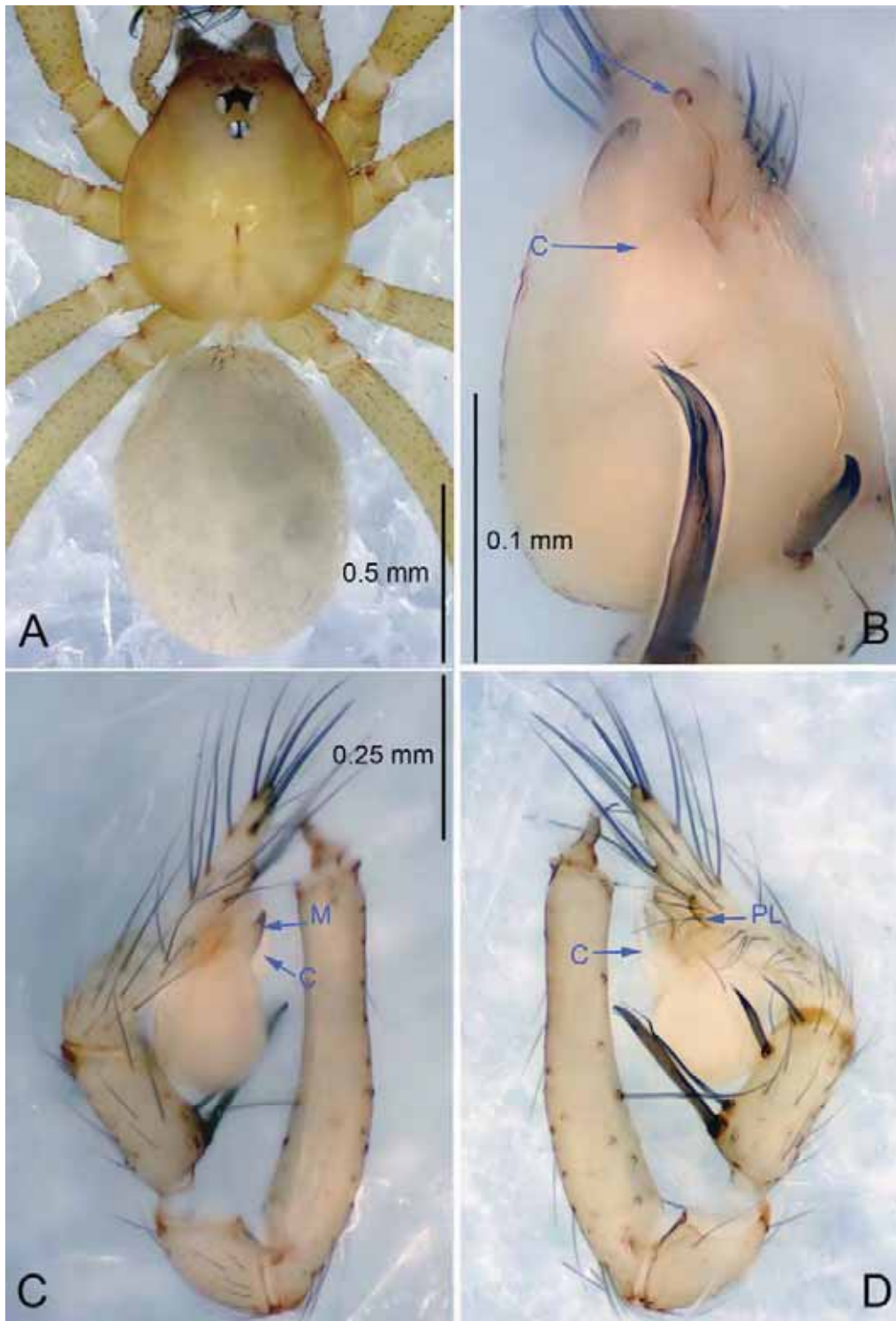
**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. penevi* Wang & Li, 2016, *L. liuguan* Wang & Li sp. nov. but can be distinguished by the male pedipalpal tibial I II III spines equally strong, stronger than others (Fig. 68C) (tibial I II spines equally strong, stronger than others in *L. penevi*, tibial spines slender, equally strong in *L. liuguan* Wang & Li sp. nov.); from *L. changtu* Wang & Li sp. nov. median apophysis short, 1/5 the length of bulb (Fig. 68B) (median apophysis long, half the length of bulb in *L. liuguan* Wang & Li sp. nov.); from *L. penevi* by the cymbium not constricted (cymbium constricted medially in *L. penevi*).

**Description. Male (holotype).** Total length 2.33 (Fig. 68A). Carapace 1.06 long, 1.03 wide. Opisthosoma 1.38 long, 1.08 wide. Carapace yellowish. Ocular area with a pair of setae, eyes absent. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.14 high. Opisthosoma pale yellow, ovoid, with brown spots. Leg measurements: I 10.02 (2.69, 0.39, 2.91, 2.38, 1.65); II 8.75 (2.37, 0.38, 2.49, 2.08, 1.43); III 7.53 (2.15, 0.38, 1.98, 1.77, 1.25); IV 9.20 (2.56, 0.38, 2.50, 2.26, 1.50). Male pedipalp (Figs 68C–D): tibia with 5 large spines retrolaterally, tibial I spine longest, I II spines equally strong, stronger than others. Cymbium not constricted. Embolus triangular, prolateral lobe oval. Median apophysis palm-shaped, teeth of median apophysis reduced to sclerotized spots. Conductor semicircular (Fig. 68B).

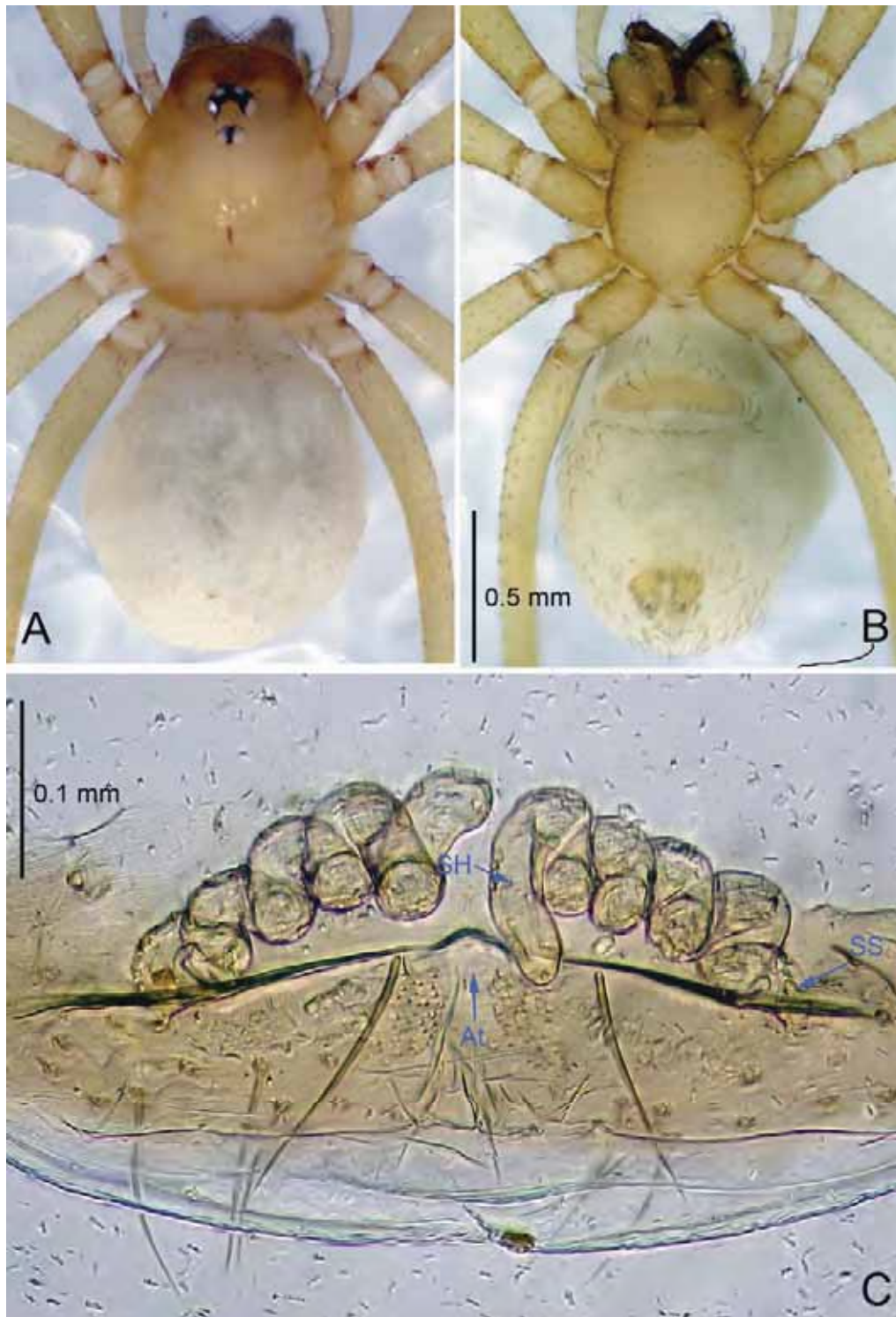
**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.70 (Figs 69A–B). Carapace 1.10 long, 0.88 wide. Opisthosoma 1.72 long, 1.48 wide. Clypeus 0.20 high. Leg measurements: I 9.10 (2.54, 0.43, 2.66, 1.98, 1.49); II 7.73 (2.21, 0.41, 2.21, 1.67, 1.23); III 6.85 (1.99, 0.40, 1.88, 1.50, 1.08); IV 8.22 (2.38, 0.41, 2.28, 1.88, 1.27). Vulva (Fig. 69C): spermathecae coiled, atrium triangular.

**Distribution.** China (Guizhou).

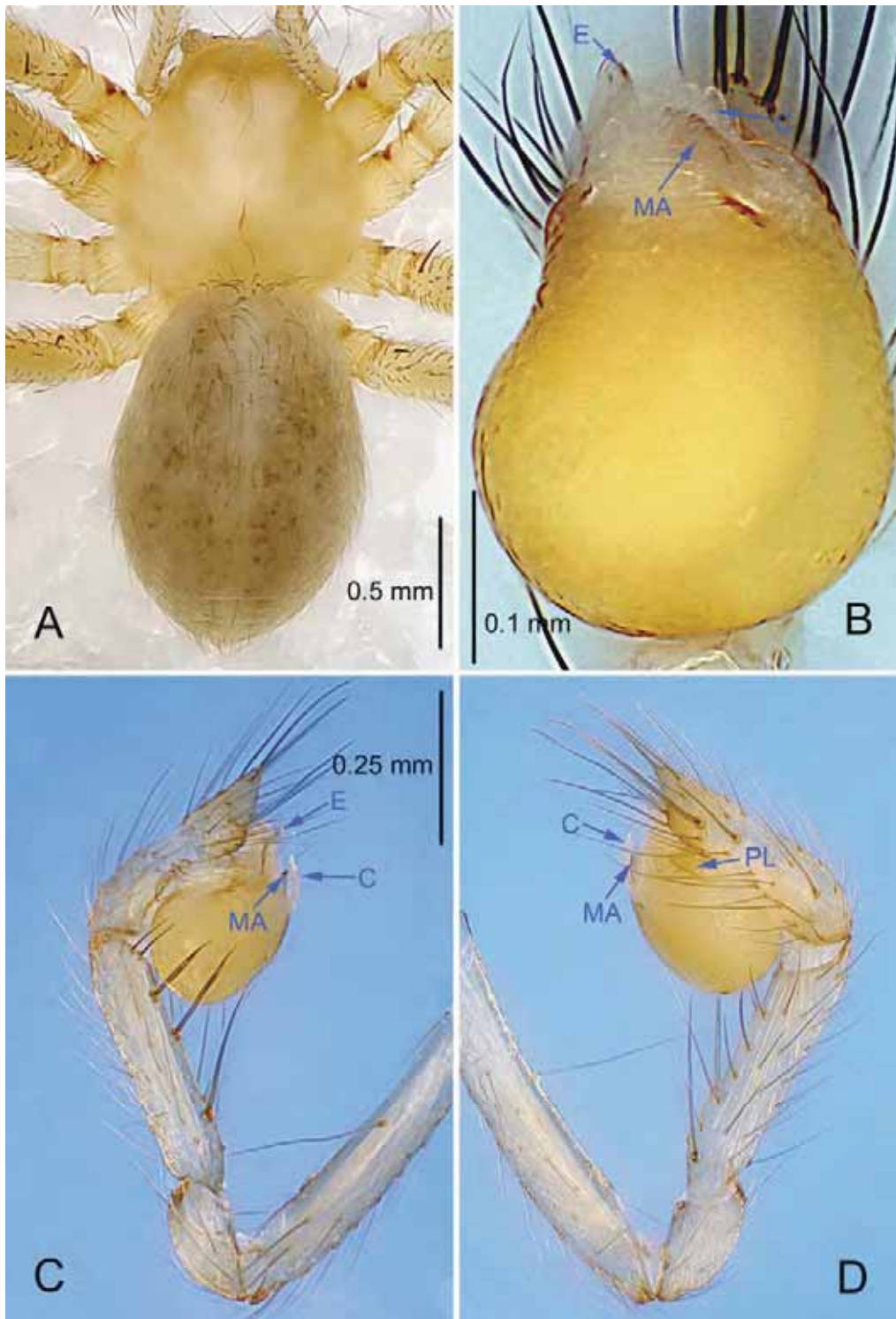


**FIGURE 66** *Leptonetela nanmu* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





**FIGURE 67** *Leptonetela nanmu* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 68** *Leptonetela changtu* sp. nov., holotype male

A: Habitus, dorsal view; B: Right palpal bulb, ventral view; C: Right palp, retrolateral view; D: Right palp, prolateral view.



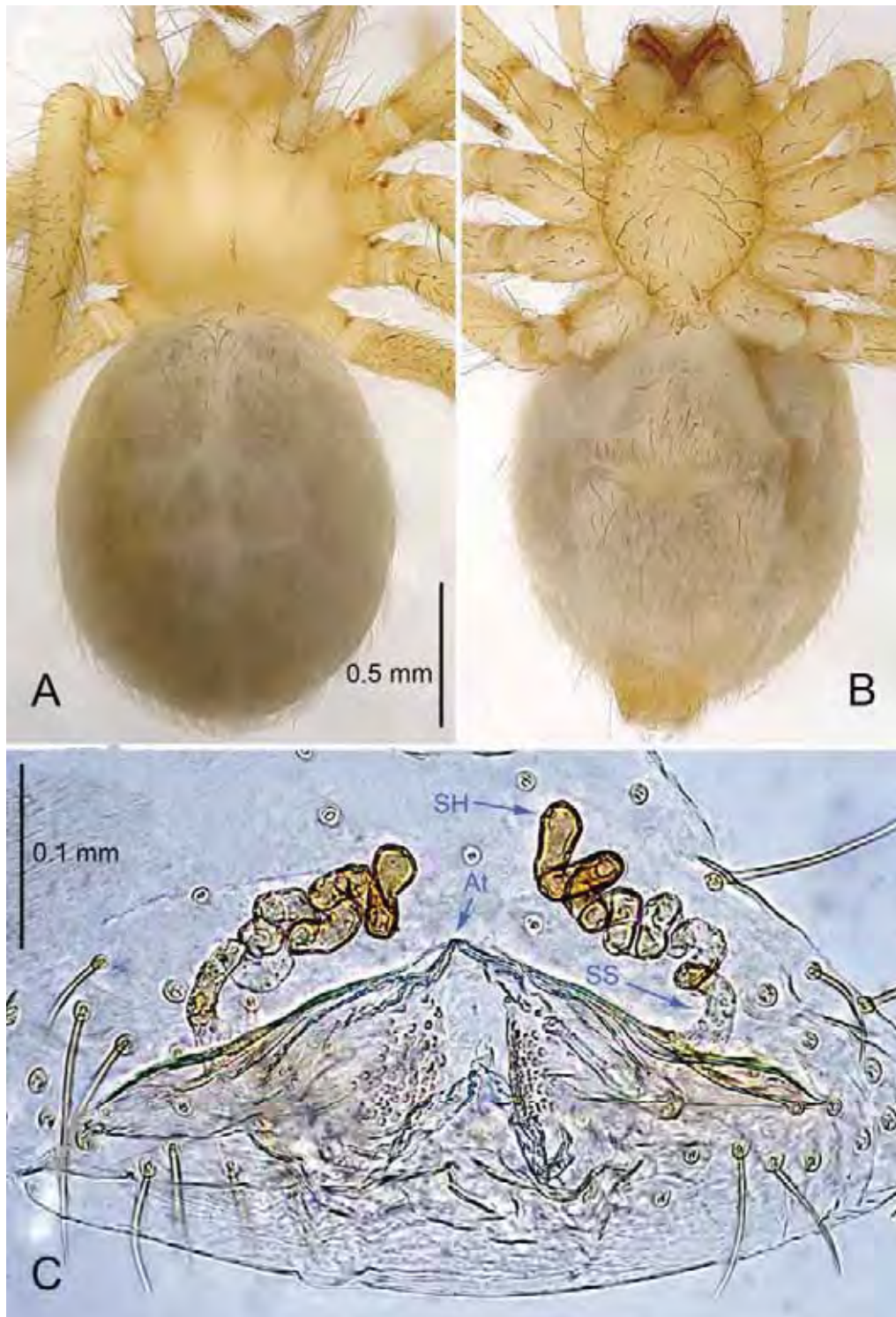


FIGURE 69 *Leptonetela changtu* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



***Leptonetela lianhua* Wang & Li sp. nov.**  
**Figs 70–71, 97**

**Type material. Holotype:** male (IZCAS), Lianhua Cave, 25.48°N, 114.09°E, Niedou Town, Chongyi County, Jiangxi Province, China, 24 April 2013, Y. Luo & J. Liu leg. **Paratypes:** 3 males and 10 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. niubizi* Wang & Li sp. nov. but can be distinguished by the male pedipalpal tibia with 5 spines retrolaterally, with I spine strongest, tip bifurcated, the other 4 spines slender, 2 of them longer than I spine (Fig. 70D); tip of median apophysis decorated with 5 small teeth, and 1 ox horn-shaped large teeth (Fig. 70B) (tibia with 5 slender spines retrolaterally, I spine longest, not bifurcated, median apophysis EIK antler-like, tip decorated with 7 small teeth in *L. niubizi* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 2.00 (Fig. 70A). Carapace 0.87 long, 0.70 wide. Opisthosoma 1.00 long, 0.87 wide. Carapace yellow. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma brown, ovoid. Leg measurements: I 9.69 (2.62, 0.25, 3.20, 2.37, 1.25); II 7.05 (2.00, 0.25, 2.10, 1.70, 1.00); III 5.70 (1.62, 0.22, 1.62, 1.37, 0.87); IV 7.45 (2.10, 0.25, 2.25, 1.75, 1.10). Male pedipalp (Figs 70C–D): tibia with 3 long setae prolaterally, and 5 spines retrolaterally, with I spine strongest, tip bifurcated, and the other 4 spines slender, 2 of them longer than I spine. Cymbium constricted medially, attaching an earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe absent. Tip of median apophysis with 5 small teeth, and 1 ox horn-shaped large teeth. Conductor broad C tile-shaped in ventral view (Fig. 70B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.25 (Figs 71A–B). Carapace 1.25 long, 0.95 wide. Opisthosoma 1.25 long, 0.75 wide. Clypeus 0.15 high. Leg measurements: I 8.02 (2.12, 0.30, 2.50, 1.75, 1.35); II 6.02 (1.65, 0.25, 1.75, 1.37, 1.00); III 5.07 (1.35, 0.27, 1.50, 1.20, 0.75); IV 6.85 (2.00, 0.30, 1.95, 1.50, 1.10). Vulva (Fig. 71C): spermathecae slender, coiled and atrium triangular.

**Distribution.** China (Jiangxi).

***Leptonetela niubizi* Wang & Li sp. nov.**  
**Figs 72–73, 97**

**Type material. Holotype:** male (IZCAS), Niubizi Cave, 27.62°N, 106.67°E, Leshan Town, Zunyi County, Zunyi City, Guizhou Province, China, 1 August 2012, H. Zhao leg. **Paratypes:** 7 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. lianhua* Wang & Li sp. nov. but can be distinguished by the male pedipalp tibia with 5 slender spines retrolaterally, I spine longest, not bifurcated (Fig. 72C), median apophysis EIK antler-like, distal edge decorated with 7 small teeth (Fig. 72B) (tibia with 5 spines retrolateral, I spine strongest, tip bifurcated, the other 4 spines slender, 2 of them longer than I spine; tip of median apophysis decorated with 5 small teeth, and 1 ox horn-shaped large teeth in *L. lianhua* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 2.53 (Fig. 72A). Carapace 0.95 long, 0.83 wide. Opisthosoma 1.58 long, 1.13 wide. Carapace yellowish. Ocular area with a pair of setae, eyes absent. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.15 high. Opisthosoma gray, ovoid. Leg measurements: I 9.29 (2.56, 0.38, 2.63, 2.19, 1.53); II 8.63 (2.50, 0.38, 2.34, 2.03, 1.38); III 6.94 (2.03, 0.31, 1.47, 1.75, 1.38); IV - (2.55, 0.38, -, -, -). Male pedipalp (Figs 72C–D): tibia with 4 long setae prolaterally, 2 long setae and 5 slender spines retrolaterally, with I spine longest. Cymbium constricted medially, attaching a small earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe oval. Median apophysis EIK antler-like, distal edge decorated with 7 small teeth. Conductor short, C tile-shaped (Fig. 72B).

**Female (one of the paratypes).** Similar to male in color and general features, but with a larger body size and shorter legs. Total length 2.60 (Figs 73A–B). Carapace 0.96 long, 0.95 wide. Opisthosoma 1.60 long, 1.25 wide. Clypeus 0.19 high. Leg measurements: I 8.20 (2.34, 0.34, 2.44, 1.75, 1.33); II 7.46 (2.25, 0.38, 1.88, 1.65, 1.30); III 6.08 (2.05, 0.30, 1.08, 1.55, 1.10); IV 8.27 (2.38, 0.38, 2.25, 1.88, 1.38). Vulva (Fig. 73C): spermathecae coiled, atrium triangular.

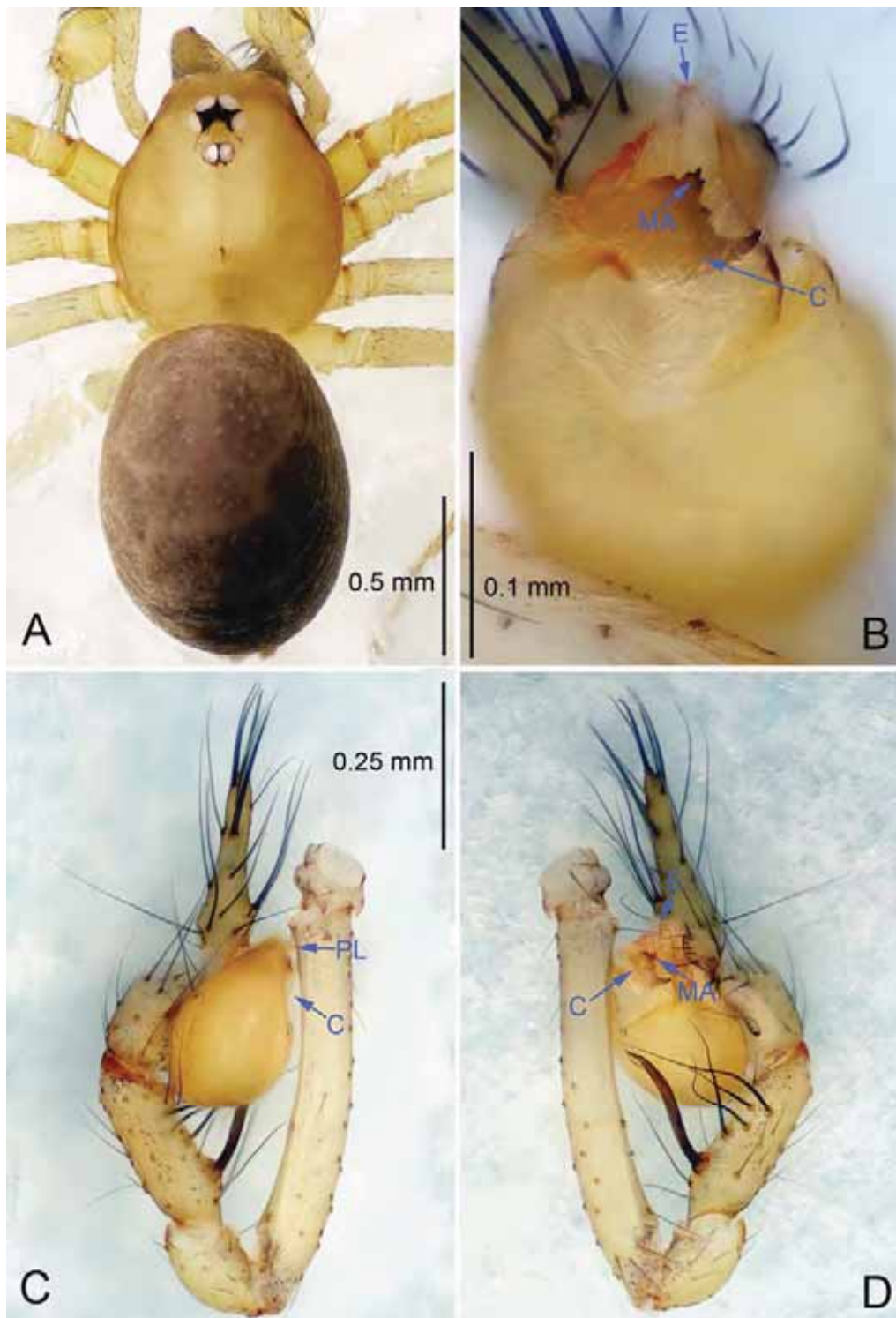
**Distribution.** China (Guizhou).

***Leptonetela longyu* Wang & Li sp. nov.**  
**Figs 74–75, 97**

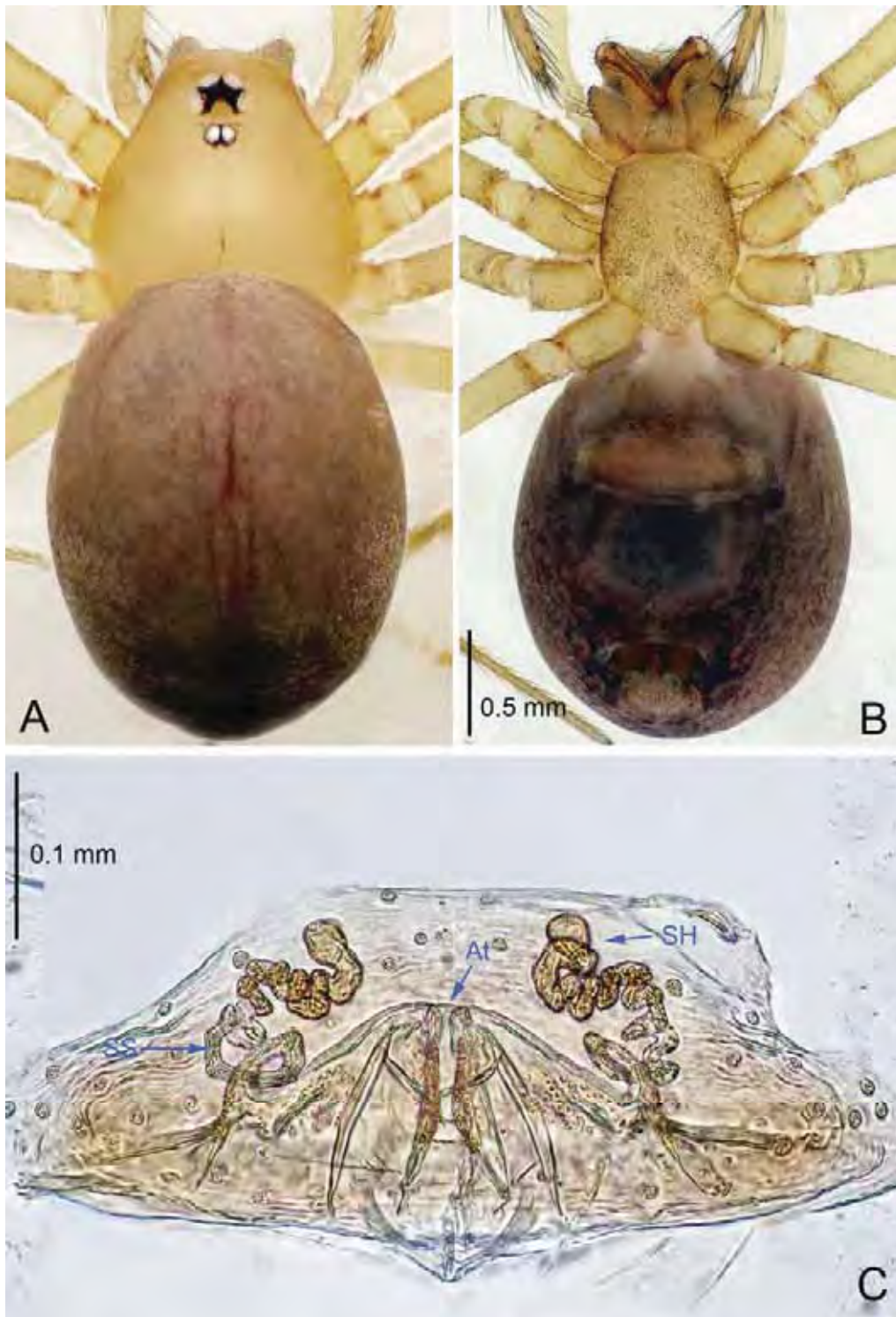
**Type material. Holotype:** male (IZCAS), Longyu Cave, 29.40°N, 110.09°E, Cili County, Hunan Province, China, 5 June 2011, Z. Zha leg. **Paratypes:** 4 males and 5 females, same data as holotype, 5 males and 6 females, Niuerduo Cave, 29.404°N, 110.73°E, Cili County, Hunan Province, China, 9 April 2016, Y. Li & Z. Chen leg.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. sexdentata* Wang & Li, 2011, *L. shicheng* Wang & Li sp. nov., *L. zakou* Wang & Li sp. nov. and *L. meiwang* Wang & Li sp. nov. but can be distinguished by on the male pedipalpal bulb median apophysis harrow-like, tip with 5 small teeth (Fig. 74B) (tip of median apophysis with 6 small teeth in *L. sexdentata* and *L. zakou* Wang & Li sp. nov., 5 sharp teeth in *L. meiwang* Wang & Li sp. nov. and 10 in *L. shicheng* Wang & Li sp. nov.); from *L. shicheng* Wang & Li sp. nov. by the tip of conductor wavy

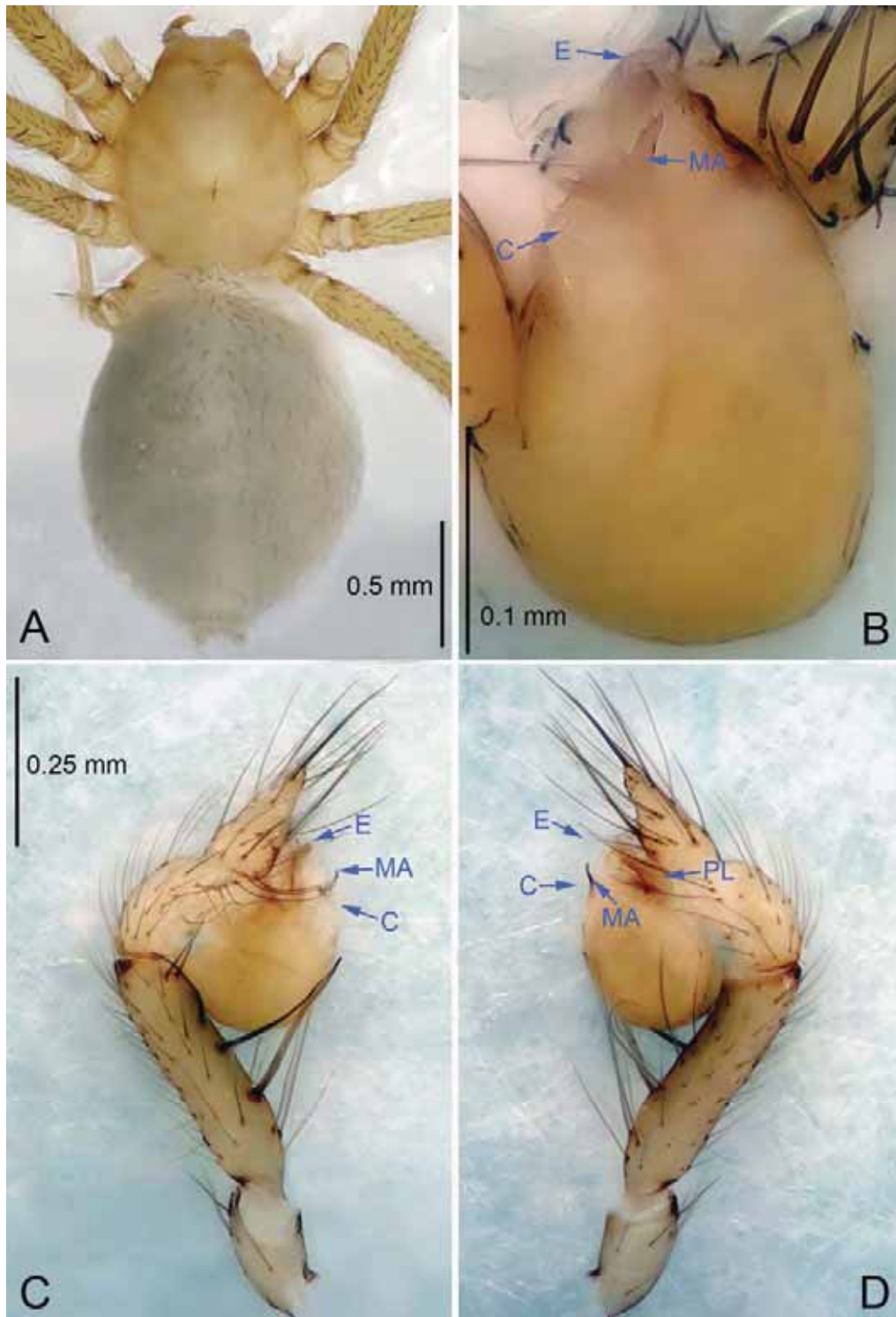


**FIGURE 70** *Leptonetela lianhua* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



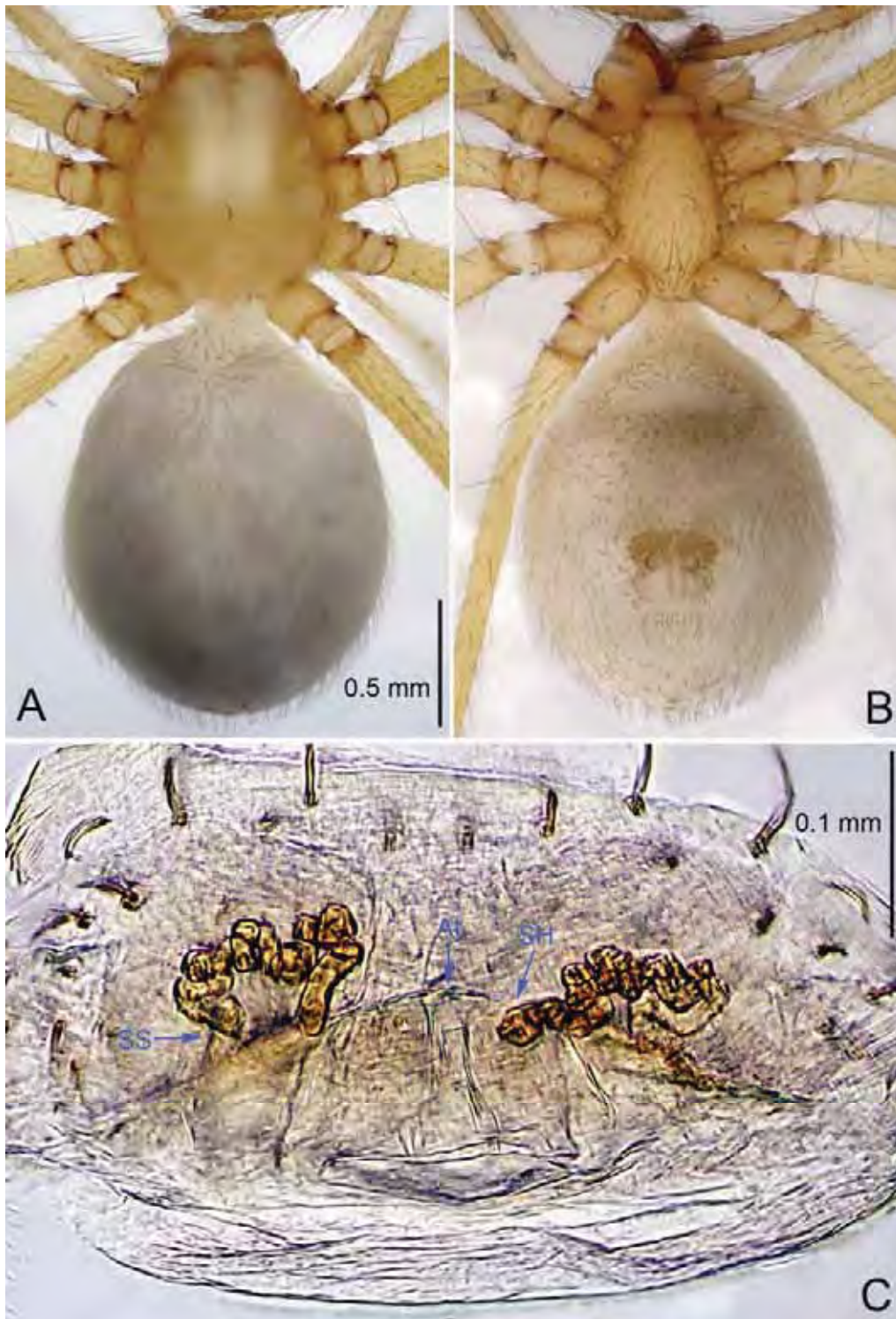
**FIGURE 71** *Leptonetela lianhua* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.





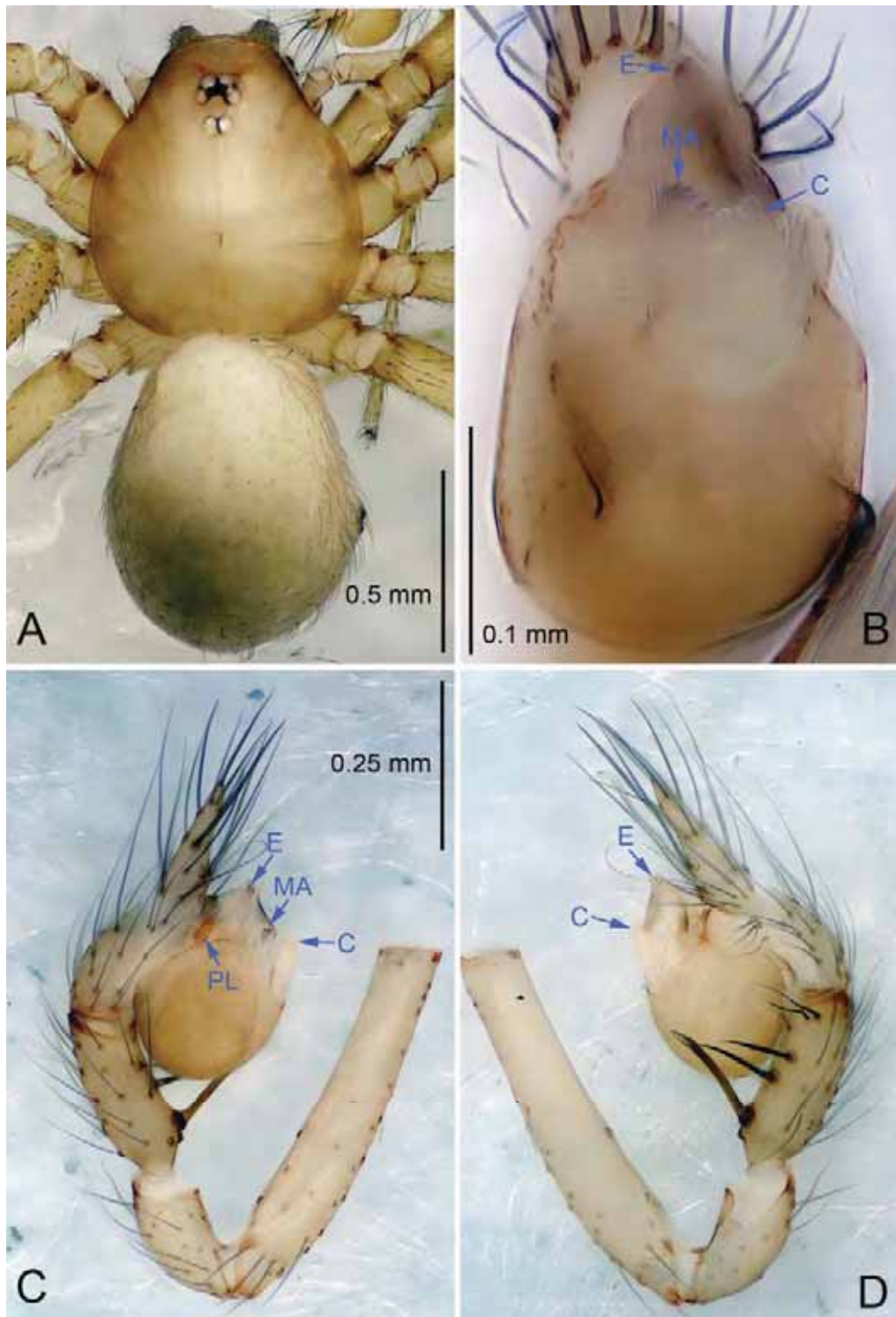
**FIGURE 72** *Leptonetela niubizi* sp. nov., holotype male

A: Habitus, dorsal view; B: Right palpal bulb, ventral view; C: Right palp, retrolateral view; D: Right palp, prolateral view.



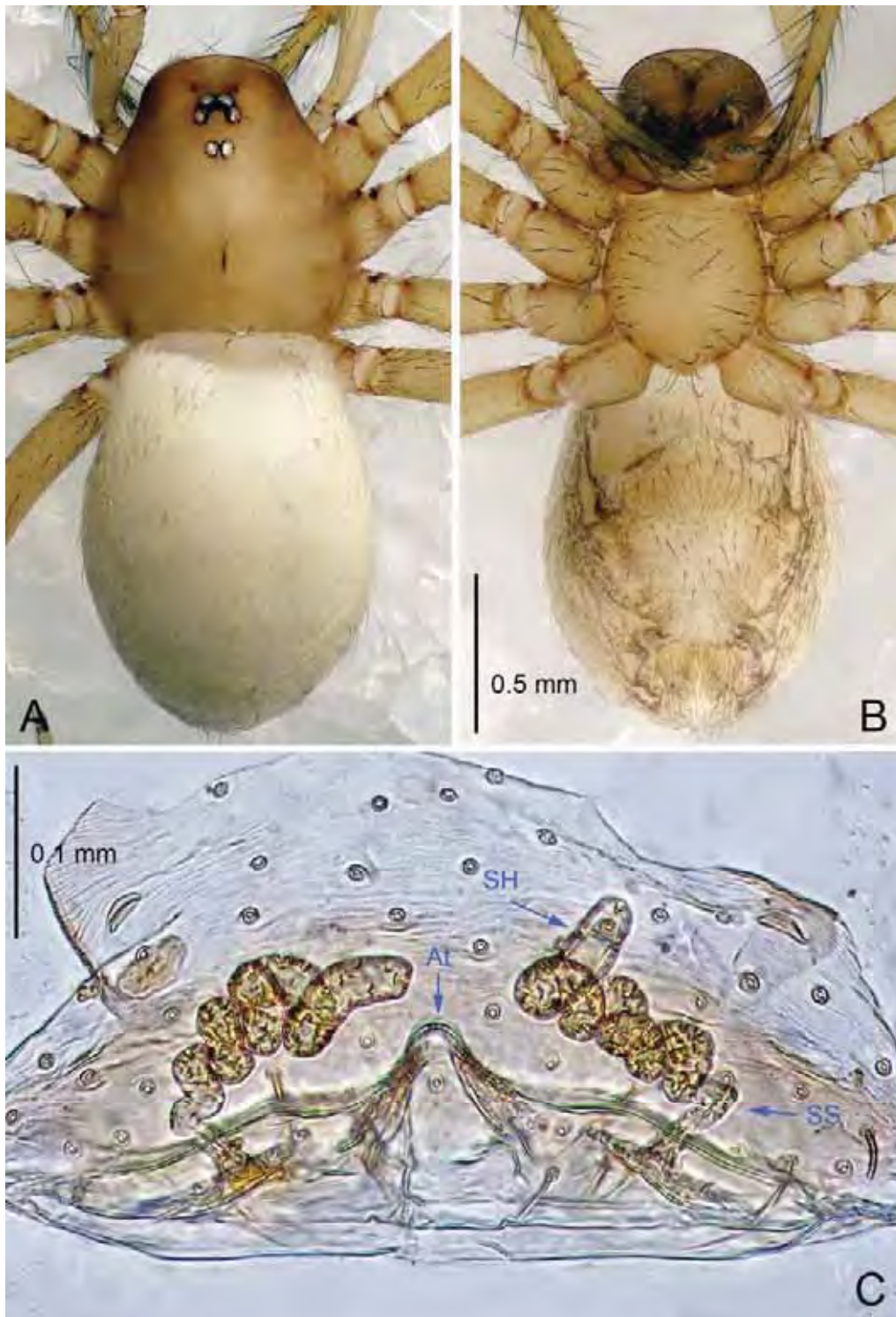
**FIGURE 73** *Leptonetela niubizi* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.





**FIGURE 74** *Leptonetela longyu* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





**FIGURE 75** *Leptonetela longyu* sp. nov., one of paratype females  
 A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

line-shaped (Fig. 74B) (tip of conductor smooth in *L. shicheng* Wang & Li sp. nov.); from *L. zakou* Wang & Li sp. nov. by the teeth of median apophysis needle-shaped in *L. zakou* Wang & Li sp. nov.; from *L. meiwang* Wang & Li sp. nov. by the tibial I spine strongest, tip asymmetrically bifurcated (tibial II spine strongest in *L. meiwang* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 1.63 (Fig. 74A). Carapace 1.05 long, 0.75 wide. Opisthosoma 0.88 long, 0.63 wide. Carapace yellow. Eyes six. Median groove needle-shaped, cervical grooves and radial furrows distinct. Clypeus 0.13 high. Opisthosoma gray, ovoid. Leg measurements: I 6.28 (1.63, 0.25, 1.85, 1.55, 1.00); II 4.89 (1.25, 0.25, 1.38, 1.13, 0.88); III 4.13 (1.10, 0.23, 1.05, 1.00, 0.75); IV 5.63 (1.55, 0.25, 1.50, 1.38, 0.95). Male pedipalp (Figs 74C–D): tibia with 2 spines prolaterally and 5 spines retrolaterally, with I spine strongest, tip asymmetrically bifurcated. Cymbium constricted medially, attaching a small earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe oval. Median apophysis short, palm-shaped, distal edge with 5 small teeth. Conductor C tile-shaped in ventral view, tip of conductor wavy line-shaped (Fig. 74B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with longer legs. Total length 2.05 (Figs 75A–B). Carapace 0.90 long, 0.75 wide. Opisthosoma 1.13 long, 0.88 wide. Clypeus 0.12 high. Leg measurements: I 6.28 (1.75, 0.25, 1.88, 1.40, 1.00); II 4.94 (1.30, 0.25, 1.38, 1.13, 0.88); III 4.41 (1.25, 0.23, 1.13, 1.05, 0.75); IV 5.58 (1.60, 0.25, 1.50, 1.35, 0.88). Vulva (Fig. 75C): spermathecae coiled, atrium triangular.

**Distribution.** China (Hunan).

***Leptonetela shicheng* Wang & Li sp. nov.**  
Figs 76–77, 97

**Type material. Holotype:** male (IZCAS), Shicheng Cave, 27.31°N, 109.07°E, Jiangwu, Shanshi Town, Lianhua County, Pingxiang City, Jiangxi Province, China, 14 November 2015, Z. Chen & G. Zhou leg. **Paratypes:** 2 males and 5 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. sexdentata* Wang & Li, 2011, *L. longyu* Wang & Li sp. nov., *L. zakou* Wang & Li sp. nov. and *L. meiwang* Wang & Li sp. nov. but can be distinguished by on the male pedipalpal bulb median apophysis harrow-like, with 10 small teeth distally (Fig. 76B) (median apophysis with 6 small teeth distally in *L. sexdentata* and *L. zakou* Wang & Li sp. nov., 5 in *L. longyu* Wang & Li sp. nov., and *L. meiwang* Wang & Li sp. nov.); conductor smooth (Fig. 76B) (conductor wavy line-shaped distally in *L. sexdentata*, *L. longyu* Wang & Li sp. nov., and *L. zakou* Wang & Li sp. nov.); from *L. zakou* Wang & Li sp. nov. by the teeth of median apophysis needle-shaped in *L. zakou* Wang & Li sp. nov.; from *L. meiwang* Wang & Li sp. nov. by the tibial I spine strongest, tip

asymmetrically bifurcated (Fig. 76D) (tibial II spine strongest in *L. meiwang* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 2.40 (Fig. 76A). Carapace 1.00 long, 0.73 wide. Opisthosoma 1.12 long, 0.87 wide. Carapace yellowish. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.08 high. Opisthosoma gray, ovoid. Leg measurements: I 9.60 (2.60, 0.37, 2.50, 2.48, 1.65); II 7.90 (2.25, 0.30, 2.25, 2.00, 1.40); III 6.87 (1.75, 0.25, 1.87, 1.75, 1.25); IV 8.92 (2.37, 0.30, 2.50, 2.25, 1.50). Male pedipalp (Figs 76C–D): tibia 2 long setae prolaterally, and 5 spines retrolaterally, with I spine strongest, tip asymmetrically bifurcated. Cymbium constricted medially, attaching a small earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe indistinct. Median apophysis harrow-like, with 10 small teeth distally. Conductor smooth, C tile-shape in ventral view (Fig. 76B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.60 (Figs 77A–B). Carapace 0.87 long, 0.85 wide. Opisthosoma 1.75 long, 1.25 wide. Clypeus 0.15 high. Leg measurements: I 8.94 (2.60, 0.37, 2.50, 2.10, 1.37); II 7.10 (2.00, 0.30, 2.00, 1.65, 1.15); III 5.97 (1.75, 0.25, 1.60, 1.50, 0.87); IV 7.97 (2.12, 0.35, 2.25, 2.00, 1.25). Vulva (Fig. 77C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Jiangxi).

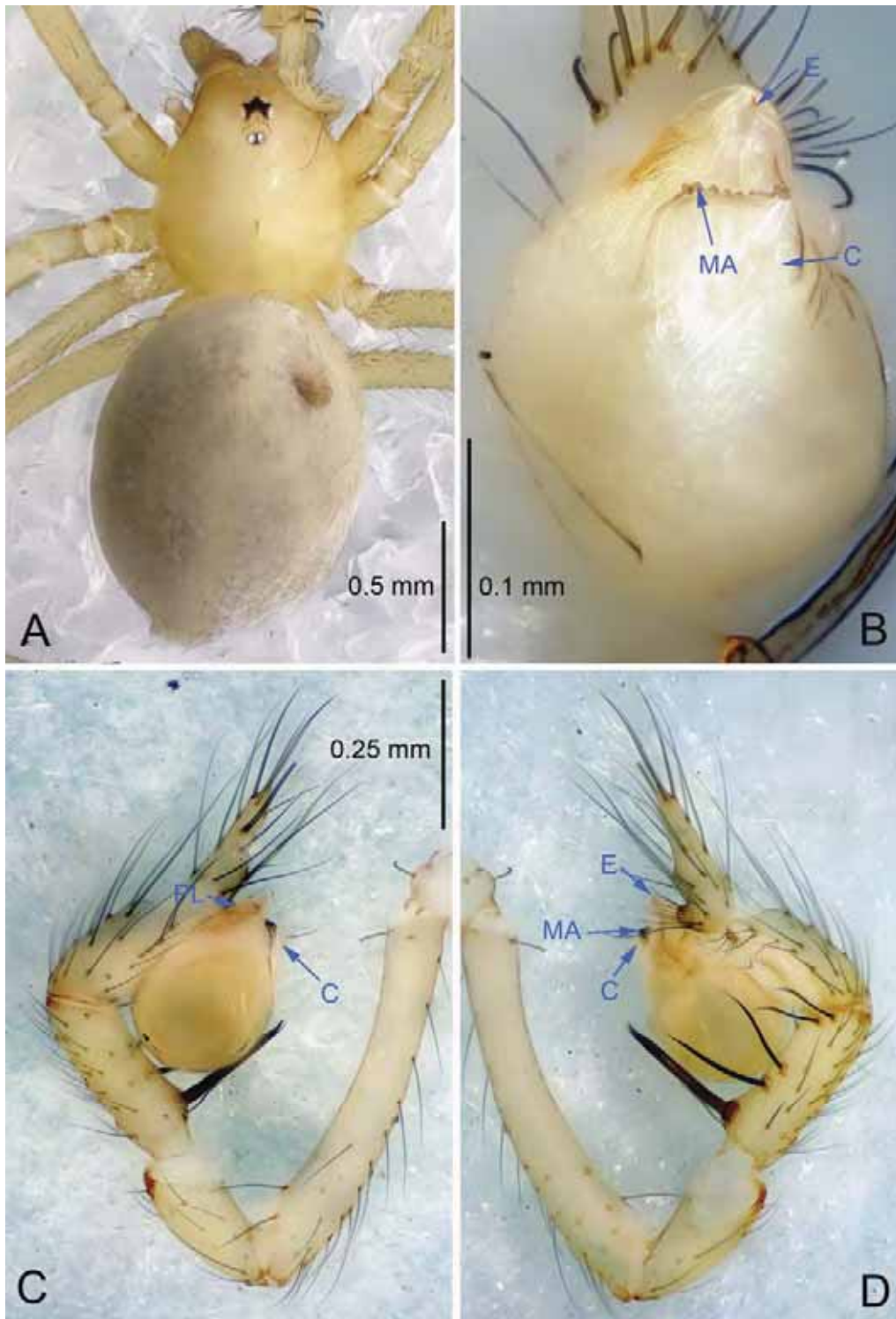
***Leptonetela zakou* Wang & Li sp. nov.**  
Figs 78–79, 97

**Type material. Holotype:** male (IZCAS), Zakou Cave, 29.35°N, 109.58°E, Hongyanxi Town, longshan City, Hunan Province, China, 10 January 2016, Z. Chen & Z. Wang leg. **Paratypes:** 3 males and 5 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. sexdentata* Wang & Li, 2011, *L. longyu* Wang & Li sp. nov., *L. shicheng* Wang & Li sp. nov., and *L. meiwang* Wang & Li sp. nov. but can be distinguished by on the male pedipalpal bulb median apophysis with 6 teeth, needle-shaped (Fig. 78B) (median apophysis with 5 small teeth distally in *L. longyu* Wang & Li sp. nov., 5 sharp teeth in *L. meiwang* Wang & Li sp. nov., and 10 in *L. shicheng* Wang & Li sp. nov.); from *L. shicheng* Wang & Li sp. nov. by the conductor wavy line-shaped distally (Fig. 78B) (conductor smooth in *L. shicheng* Wang & Li sp. nov.); from *L. meiwang* Wang & Li sp. nov. by the tibial I spine strongest, tip asymmetrically bifurcated (Fig. 78D) (tibial II spine strongest in *L. meiwang* Wang & Li sp. nov.).

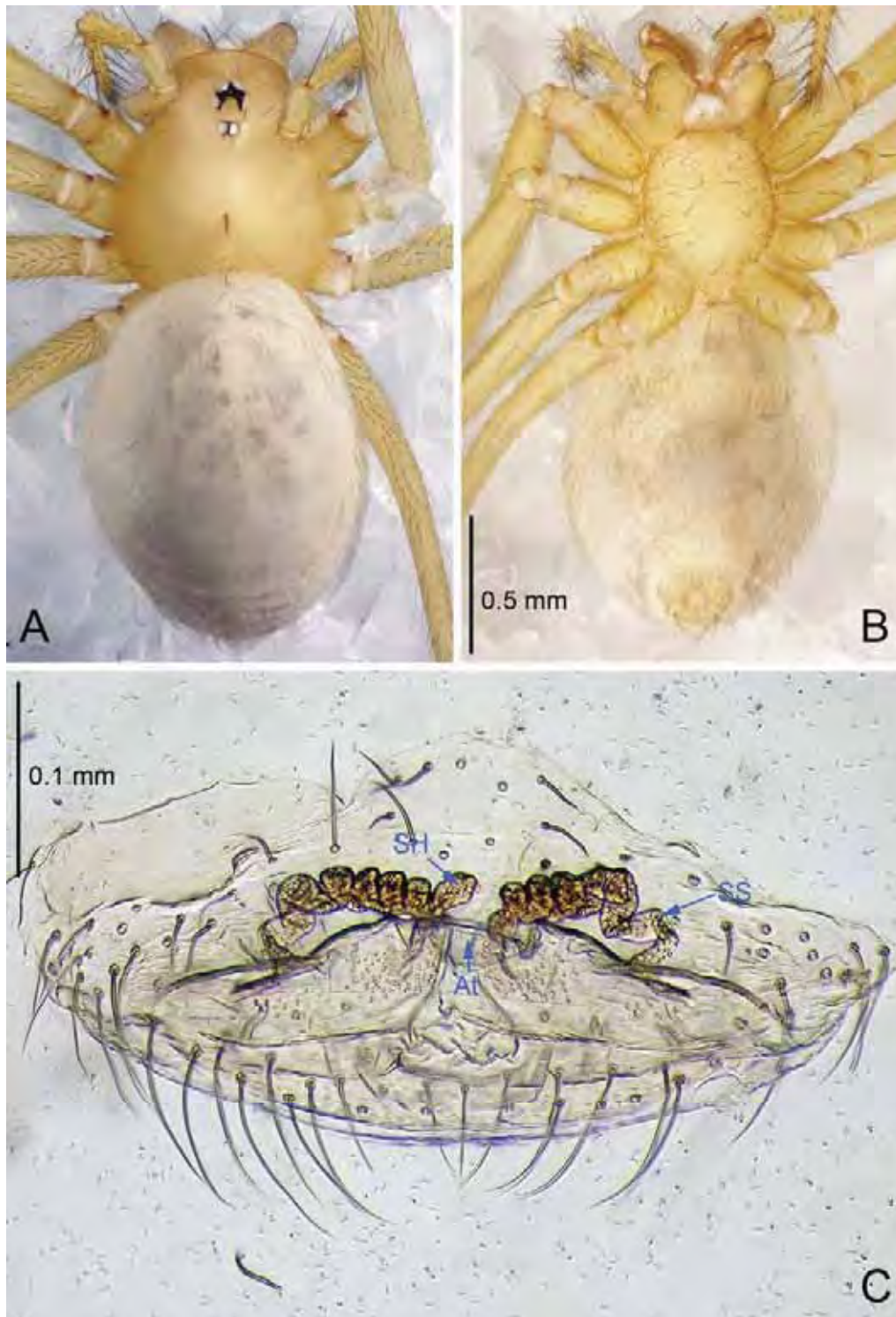
**Description. Male (holotype).** Total length 1.75 (Fig. 78A). Carapace 0.87 long, 0.87 wide. Opisthosoma 1.00 long, 0.87 wide. Carapace yellowish. Ocular area with a pair of setae,



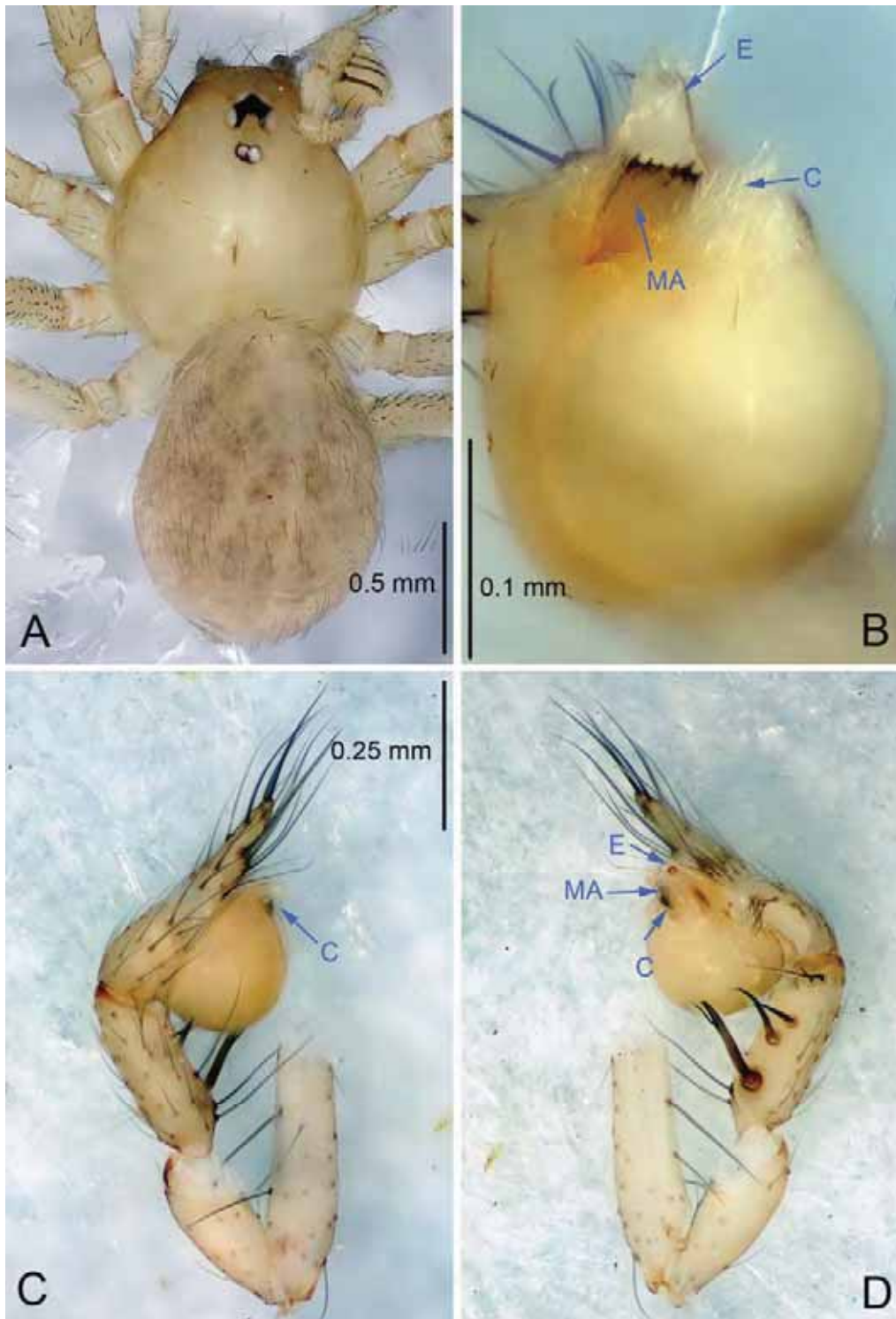
**FIGURE 76** *Leptonetela shicheng* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





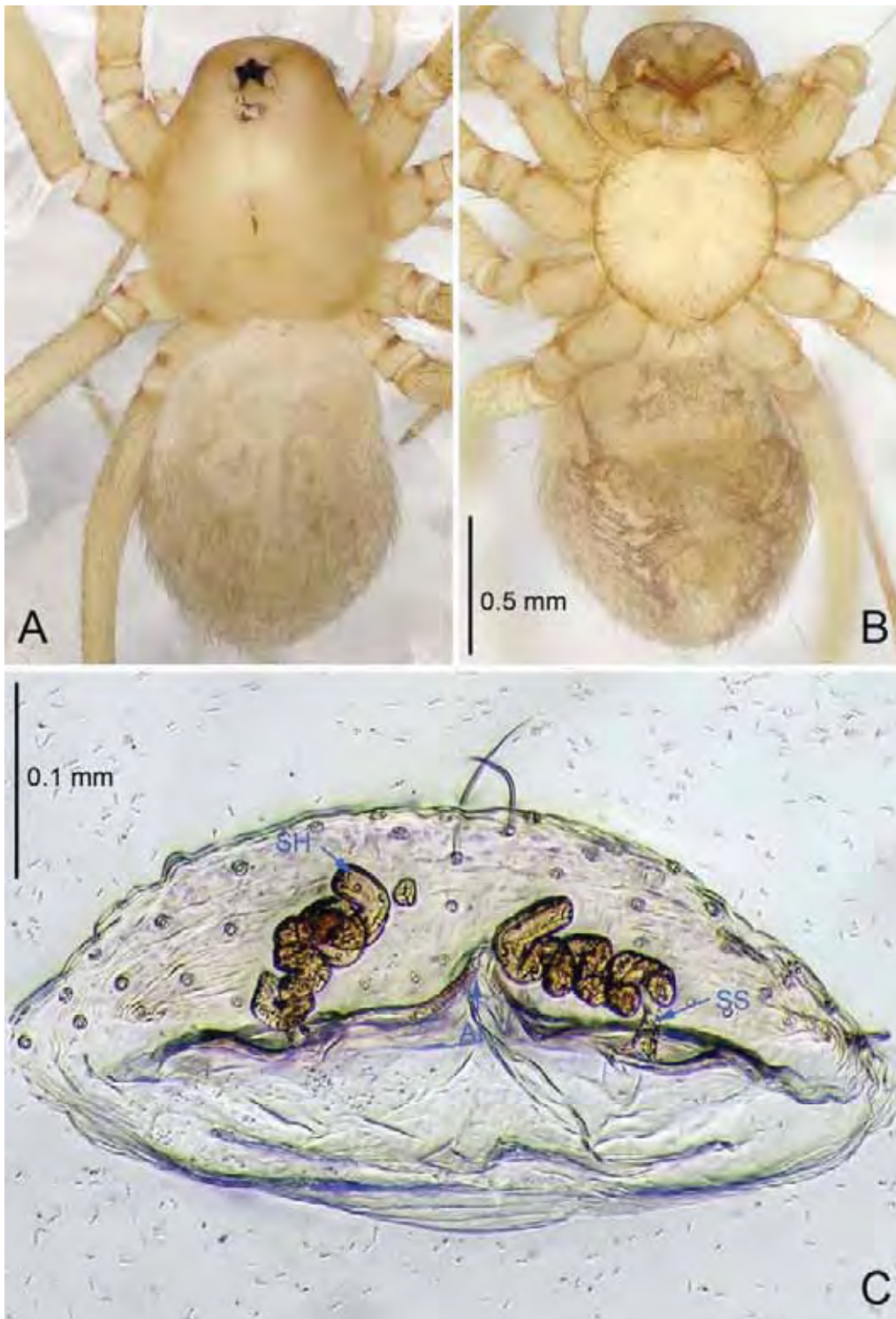
**FIGURE 77** *Leptonetela shicheng* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 78** *Leptonetela zakou* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





**FIGURE 79** *Leptonetela zakou* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



eyes six. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.08 high. Opisthosoma gray, ovoid. Leg measurements: I 7.62 (2.00, 0.25, 2.37, 1.75, 1.25); II 5.62 (1.50, 0.25, 1.62, 1.25, 1.00); III 4.57 (1.25, 0.20, 1.30, 1.12, 0.70); IV 6.47 (1.87, 0.25, 1.75, 1.50, 1.10). Male pedipalp (Figs 78C–D): tibia with 3 long setae prolaterally, 5 large spines retrolaterally, with I spine strongest, tip asymmetrically bifurcated. Cymbium not constricted, earlobe-shaped process absent. Embolus triangular, prolateral lobe absent. median apophysis with 6 needle-shaped teeth distally. Conductor C tile-shape in ventral view (Fig. 78B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 1.70 (Figs 79A–B). Carapace 0.87 long, 0.80 wide. Opisthosoma 1.27 long, 0.75 wide. Clypeus 0.15 high. Leg measurements: I 6.49 (1.75, 0.25, 1.72, 1.50, 1.27); II 4.69 (1.37, 0.25, 1.27, 1.00, 0.80); III 3.74 (1.12, 0.20, 1.00, 0.80, 0.62); IV 5.30 (1.50, 0.25, 1.50, 1.30, 0.75). Vulva (Fig. 79C): spermathecae coiled, atrium fusiformed, anterior margin of atrium with one mastoid process medially.

**Distribution.** China (Guizhou).

***Leptonetela meiwang* Wang & Li sp. nov.**  
**Figs 80–81, 97**

**Type material. Holotype:** male (IZCAS), Meiwang Cave, 28.09°N, 111.43°E, Nanhua, Zhenshang Town, Lodi County, Hunan Province, China, 27 March 2016, Y. Li & Chen. Z leg.  
**Paratypes:** 1 male and 1 female, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. sexdentata* Wang & Li, 2011, *L. longyu* Wang & Li sp. nov., *L. shicheng* Wang & Li sp. nov. and *L. zakou* Wang & Li sp. nov. but can be distinguished by on the male pedipalpal bulb median apophysis harrow-like, with 5 sharp teeth distally (Fig. 80B), tibial II spine strongest (Fig. 80C) (tibial I spine strongest, tip asymmetrically bifurcated, median apophysis with 6 small teeth distally in *L. sexdentata* and *L. zakou* Wang & Li sp. nov., 5 in *L. longyu* Wang & Li sp. nov., and 10 in *L. shicheng* Wang & Li sp. nov.); conductor short, reduced (Fig. 80B) (conductor broad, C tile-shape in *L. sexdentata*, *L. longyu* Wang & Li sp. nov., *L. shicheng* Wang & Li sp. nov. and *L. zakou* Wang & Li sp. nov.); from *L. zakou* Wang & Li sp. nov. by the teeth of median apophysis needle-shaped in *L. zakou* Wang & Li sp. nov.

**Description. Male (holotype):** total length 1.75 (Fig. 80A). Prosoma 0.70 long, 0.62 wide. Opisthosoma 1.20 long, 0.70 wide. Carapace yellowish. Ocular area with a pair of setae, eyes absent. Median groove needle shaped, cervical grooves and radial furrows indistinct. Clypeus 0.08 high. Opisthosoma gray, ovoid. Leg measurements: I 9.8 (2.50, 0.37, 2.81, 2.50, 1.62); II 8.44 (2.30, 0.35, 2.30, 2.12, 1.37); III 7.77 (2.25, 0.30, 2.12, 2.10, 1.00); IV 9.61 (2.50, 0.37, 2.50, 2.37, 1.87). Male

pedipalp (Figs 80C–D): tibia with 5 spines retrolaterally, with II spine strongest. Cymbium constricted at middle, earlobe-shaped process absent. Embolus triangular, prolateral lobe indistinct. median apophysis with 5 sharp teeth distally. Conductor short, reduced (Fig. 80B).

**Female.** Similar to male in color and general features, but larger and with shorter legs. Total length 1.75 (Figs 81A–B). Prosoma 0.75 long, 0.62 wide. Opisthosoma 1.00 long, 0.75 wide. Clypeus 0.20 high. Leg measurements: I 8.13 (2.37, 0.34, 2.30, 1.75, 1.37); II 7.54 (2.25, 0.34, 2.00, 1.70, 1.25); III 6.62 (1.87, 0.30, 1.75, 1.50, 1.20); IV - (2.30, 0.34, -, -, -). Vulva (Fig. 81C): spermathecae coiled, atrium triangular.

**Distribution.** China (Hunan).

***Leptonetela tawo* Wang & Li sp. nov.**  
**Figs 82–83, 97**

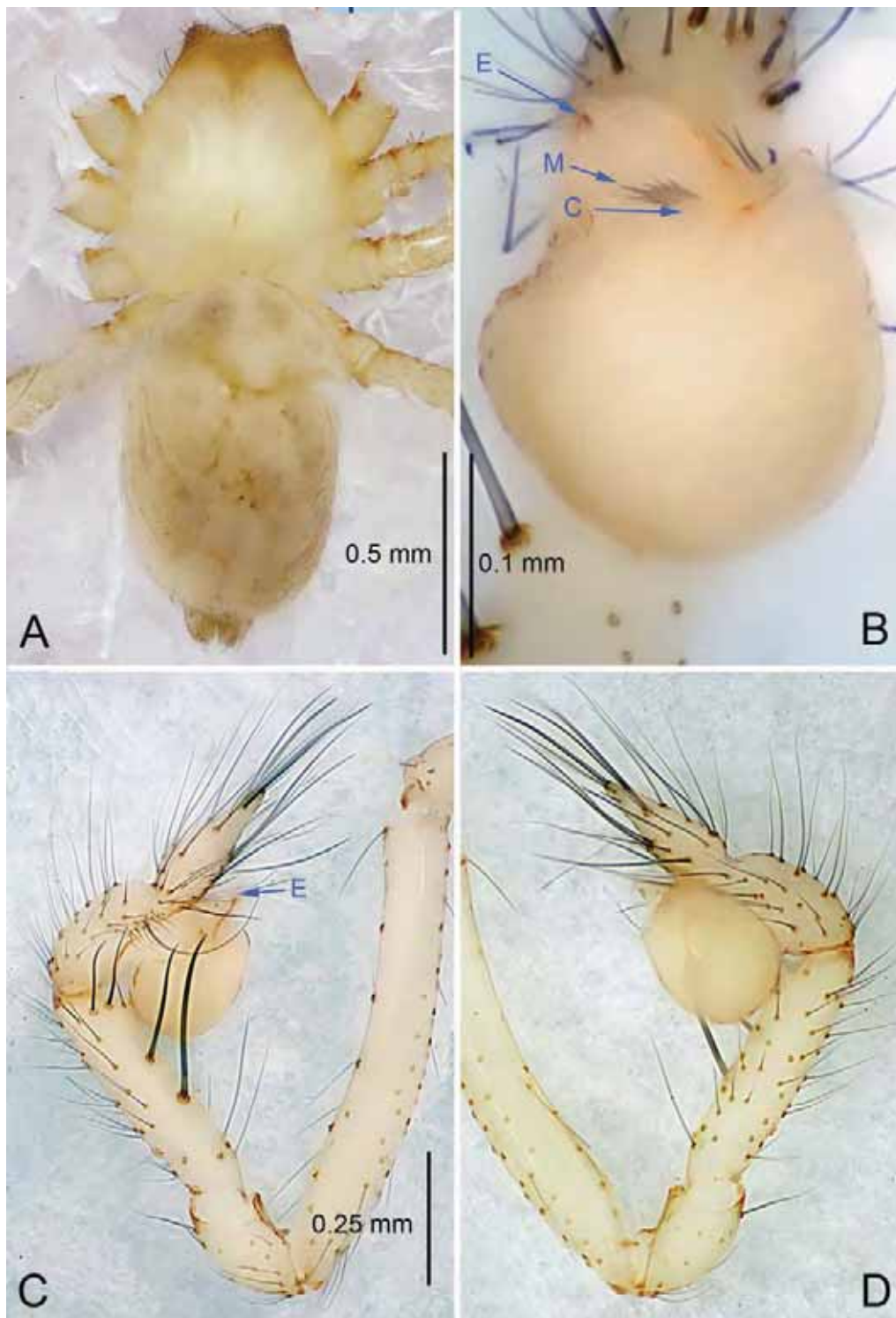
**Type material. Holotype:** male (IZCAS), Xianren Cave, 29.18°N, 109.95°E, Xianren, Tawo Town, Yongshun County, Hunan Province, China, 14 January 2016, Z. Chen & Z. Wang leg.  
**Paratypes:** 2 males and 2 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. arvanitidisi* Wang & Li, 2016, *L. paragamiani* Wang & Li, 2016 and *L. erlong* Wang & Li sp. nov. but can be distinguished by on the male pedipalpal bulb median apophysis with 4 teeth distally (Fig. 82B) (median apophysis with 6 teeth distally in *L. arvanitidisi*, 3 teeth in *L. paragamiani* and 5 teeth in *L. erlong* Wang & Li sp. nov.); tibial I spine strongest, tip asymmetrically bifurcated, II, III spines equally strong, stronger than other 2 (Fig. 82C) (tibial II–V spines slender, curved, and equally strong in *L. arvanitidisi* and *L. erlong* Wang & Li sp. nov., tibial III–V spines equally strong, slender than II spine in *L. paragamiani*); from *L. arvanitidisi* by the conductor C tile-shaped (Fig. 82B) (conductor triangular in *L. arvanitidisi*).

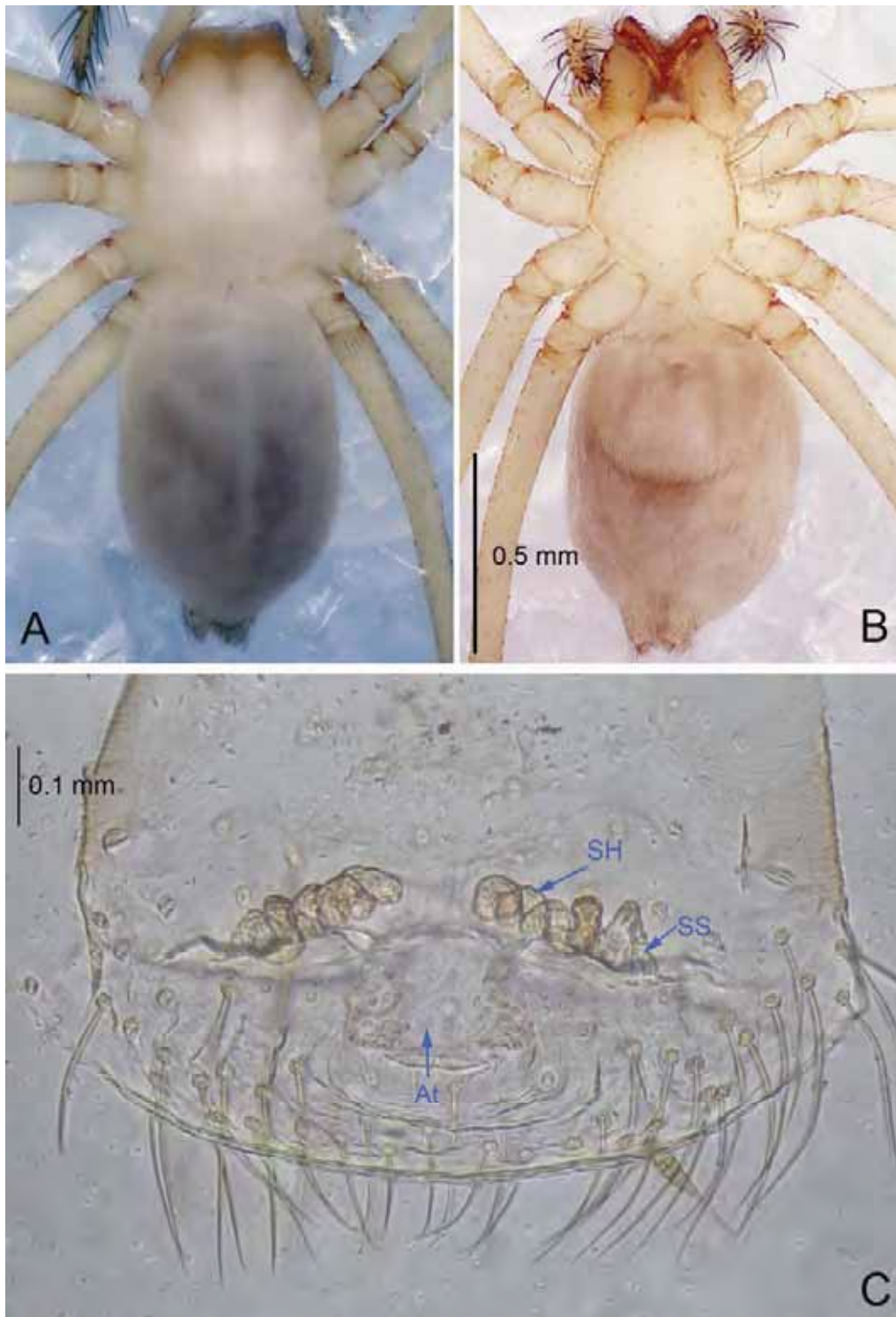
**Description. Male (holotype).** Total length 1.90 (Fig. 82A). Carapace 0.87 long, 0.75 wide. Opisthosoma 1.25 long, 0.87 wide. Carapace yellowish. Ocular area with a pair of setae, eyes six. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.08 high. Opisthosoma gray, ovoid. Leg measurements: I 7.69 (2.00, 0.35, 2.37, 1.72, 1.25); II 5.95 (1.75, 0.30, 1.55, 1.35, 1.00); III 4.60 (1.25, 0.25, 1.15, 1.10, 0.85); IV 7.15 (1.85, 0.30, 2.25, 1.60, 1.15). Male pedipalp (Figs 82C–D): tibia with 4 long setae prolaterally, 5 large spines retrolaterally, with I spine strongest, tip asymmetrically bifurcated, II, III tibia spines equally strong, stronger than other 2. Cymbium not constricted, earlobe-shaped process absent. Embolus triangular, prolateral lobe indistinct. median apophysis with 4 teeth distally. Conductor C tile-shaped in ventral view (Fig. 82B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length



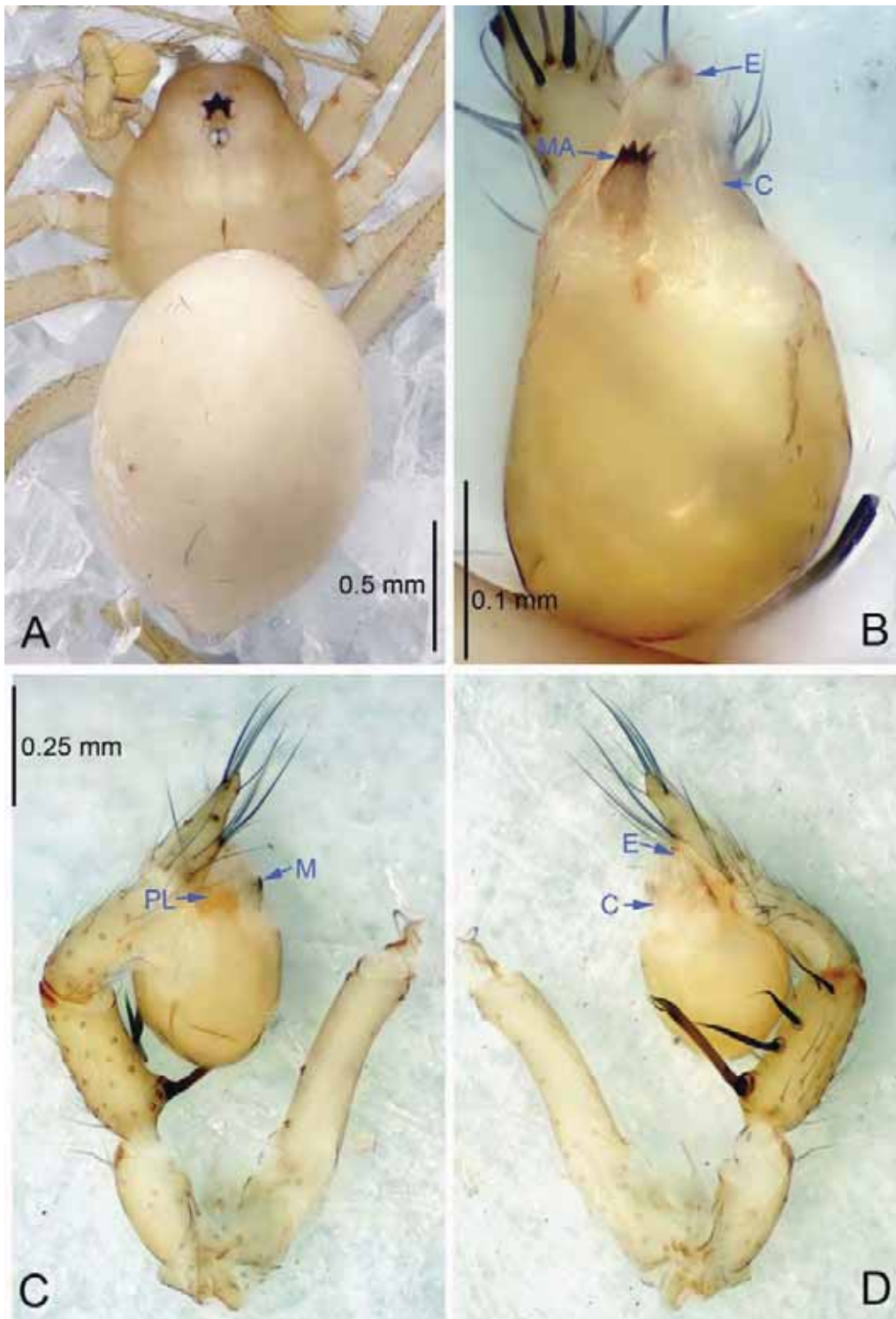
**FIGURE 80** *Leptonetela meiwang* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.

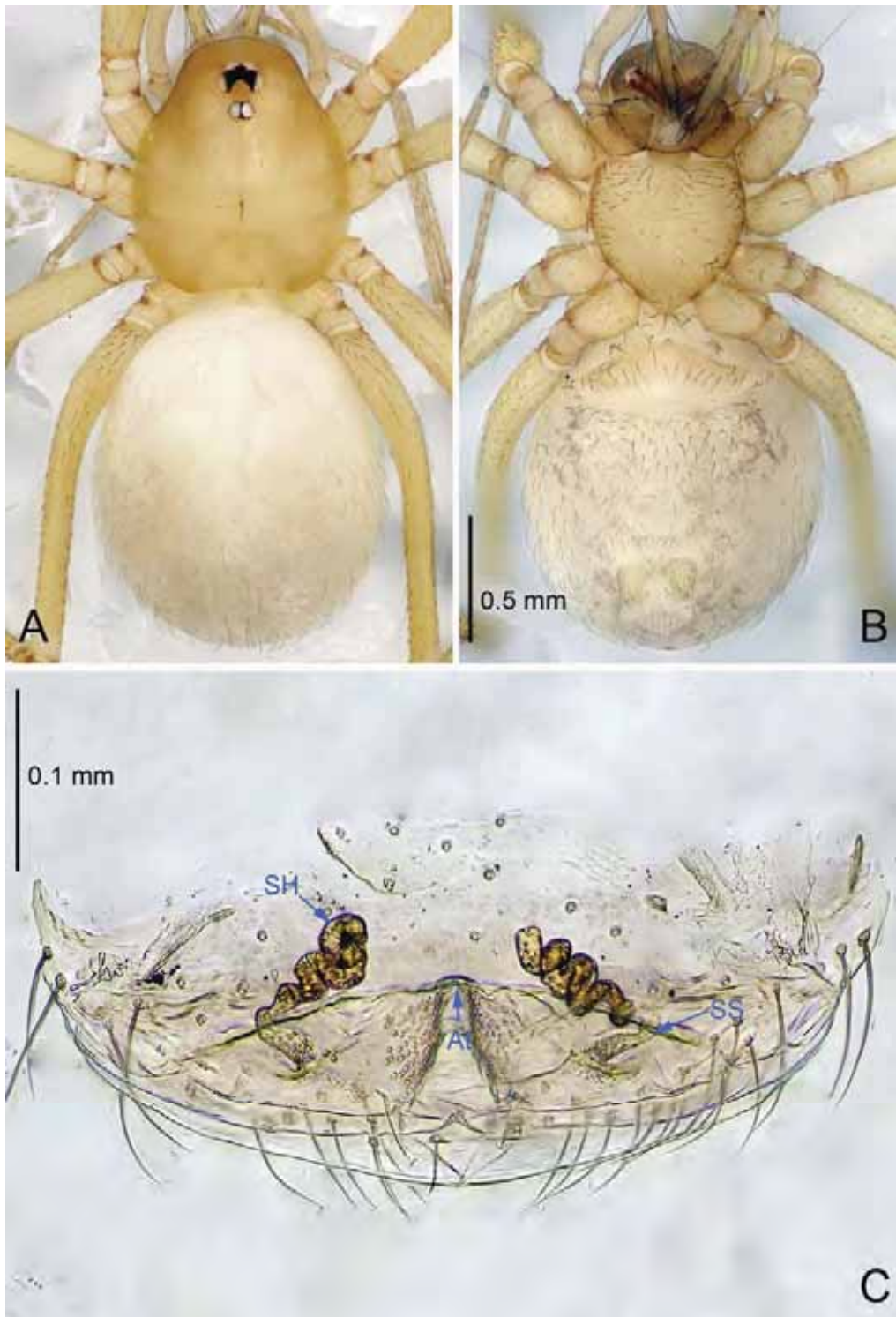


**FIGURE 81** *Leptonetela meiwang* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.





**FIGURE 82** *Leptonetela tawo* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



**FIGURE 83** *Leptonetela tawo* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

2.00 (Figs 83A–B). Carapace 0.87 long, 0.75 wide. Opisthosoma 1.12 long, 1.00 wide. Clypeus 0.15 high. Leg measurements: I 5.84 (1.62, 0.35, 1.62, 1.25, 1.00); II 4.55 (1.25, 0.35, 1.20, 1.00, 0.75); III 3.62 (1.00, 0.30, 0.87, 0.85, 0.60); IV 5.42 (1.75, 0.35, 1.37, 1.10, 0.85). Vulva (Fig. 83C): spermathecae coiled, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela erlong* Wang & Li sp. nov.**  
**Figs 84–85, 97**

**Type material. Holotype:** male (IZCAS), Erlong Cave, 27.82°N, 110.23°E, Siqian Town, Chenxi County, Huaihua City, Hunan Province, China, 19 March 2016, Y. Li & Chen. Z leg.  
**Paratypes:** 4 males and 2 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. arvanitidisi* Wang & Li, 2016, *L. paragamiani* Wang & Li, 2016 and *L. tawo* Wang & Li sp. nov. but can be distinguished by on the male pedipalpal bulb median apophysis with 5 teeth distally (Fig. 84B) (median apophysis with 6 teeth in *L. arvanitidisi*, 4 teeth in *L. tawo* Wang & Li sp. nov. and 3 teeth *L. paragamiani*); from *L. paragamiani* and *L. tawo* Wang & Li sp. nov. by the tibial II–V spines slender, curved, and equally strong (Fig. 84D) (tibial II, III spines equally strong, stronger than other 2 in *L. tawo* Wang & Li sp. nov., III–V spines equally strong, slender than II spine in *L. paragamiani*); from *L. arvanitidisi* by the conductor C tile-shaped (Fig. 84B) (conductor triangular in *L. arvanitidisi*).

**Description. Male (holotype):** total length 1.95 (Fig. 84A). Prosoma 0.50 long, 0.80 wide. Opisthosoma 1.45 long, 1.00 wide. Prosoma yellowish. Eyes absent. Median groove needle-shaped, brown. Cervical grooves and radial furrows indistinct. Clypeus 0.13 high, slightly sloped anteriorly. Opisthosoma pale brown, ovoid, covered with short hairs, lacking distinctive pattern. Sternum and legs yellowish. Leg measurements: I 6.81 (2.35, 0.35, 1.87, 1.37, 0.87); II 5.82 (2.25, 0.35, 1.35, 1.07, 0.80); III 5.22 (2.20, 0.30, 1.00, 0.97, 0.75); IV 6.30 (2.30, 0.35, 1.50, 1.30, 0.85). Male pedipalp (Figs 84C–D): tibia with 5 spines retrolaterally, with I spine strongest, tip asymmetrically bifurcated, tibial II–V spines slender, curved, and equally strong. Cymbium constricted medially, earlobe-shaped process small. Embolus triangular, prolateral lobe indistinct. median apophysis with 5 teeth distally. Conductor C tile-shaped in ventral view (Fig. 84B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.30 (Figs 85A–B). Prosoma 0.85 long, 0.95 wide. Opisthosoma 0.87 long, 0.70 wide. Clypeus 0.20 high. Leg measurements: I 8.60 (2.50, 0.35, 2.20, 1.80, 1.75); II 7.65 (2.35, 0.30, 1.95, 1.70, 1.35); III 6.30 (2.15, 0.25, 2.05, 1.15, 0.70); IV 7.85 (2.25, 0.30, 2.05, 1.75, 1.50). Vulva (Fig. 85C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Hunan).

***Leptonetela dabian* Wang & Li sp. nov.**  
**Figs 86–87, 97**

**Type material. Holotype:** male (IZCAS), Wuming Cave, 25.75°N, 107.92°E, Dabian, Sandong Town, Sandu County, Qiannan Prefecture, Guizhou, China, 22 March 2013, H. Zhao & J. Liu leg. **Paratypes:** 2 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. thracia* Wang & Li, 2011, *L. chuan* Wang & Li sp. nov., but can be distinguished by the male pedipalpal tibia with 3 spines prolaterally, 5 slender spines, retrolaterally (Figs 86C–D) (tibia with 4 long setae prolaterally, 5 large spines retrolaterally, I, II spines equally strong, stronger than others in *L. thracia*; tibia with 7 long setae prolaterally, 5 large spines retrolaterally, I, II, III spines equally strong, stronger than others in *L. chuan* Wang & Li sp. nov.); tip of median apophysis bend upwards, with 3 larger teeth distally (Fig. 86B) (tip of median apophysis bend downwards, with 5 larger teeth distally in *L. chuan* Wang & Li sp. nov.; tip of median apophysis not bend, with 4 teeth distally in *L. thracia*); conductor thin, tongue shaped (Fig. 86B) (conductor triangular in *L. thracia* and *L. chuan* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 2.38 (Fig. 86A). Carapace 1.00 long, 0.80 wide. Opisthosoma 1.25 long, 0.90 wide. Carapace yellow. Eyes six. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma gray, ovoid, with pigmented spots. Leg measurements: I - (2.60, 0.38, 2.35, -, -); II 7.78 (2.15, 0.38, 2.25, 1.75, 1.25); III - (1.88, 0.35, 1.75, -, -); IV 8.26 (2.25, 0.38, 2.38, 2.00, 1.25). Male pedipalp (Figs 86C–D): tibia with 3 slender spines prolaterally, 5 large retrolateral spines equally strong. Cymbium constricted medially, attaching a small earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe oval. Tip of median apophysis bend upward, distal edge decorated with three small teeth. Conductor thin, tongue-shaped (Fig. 86B).

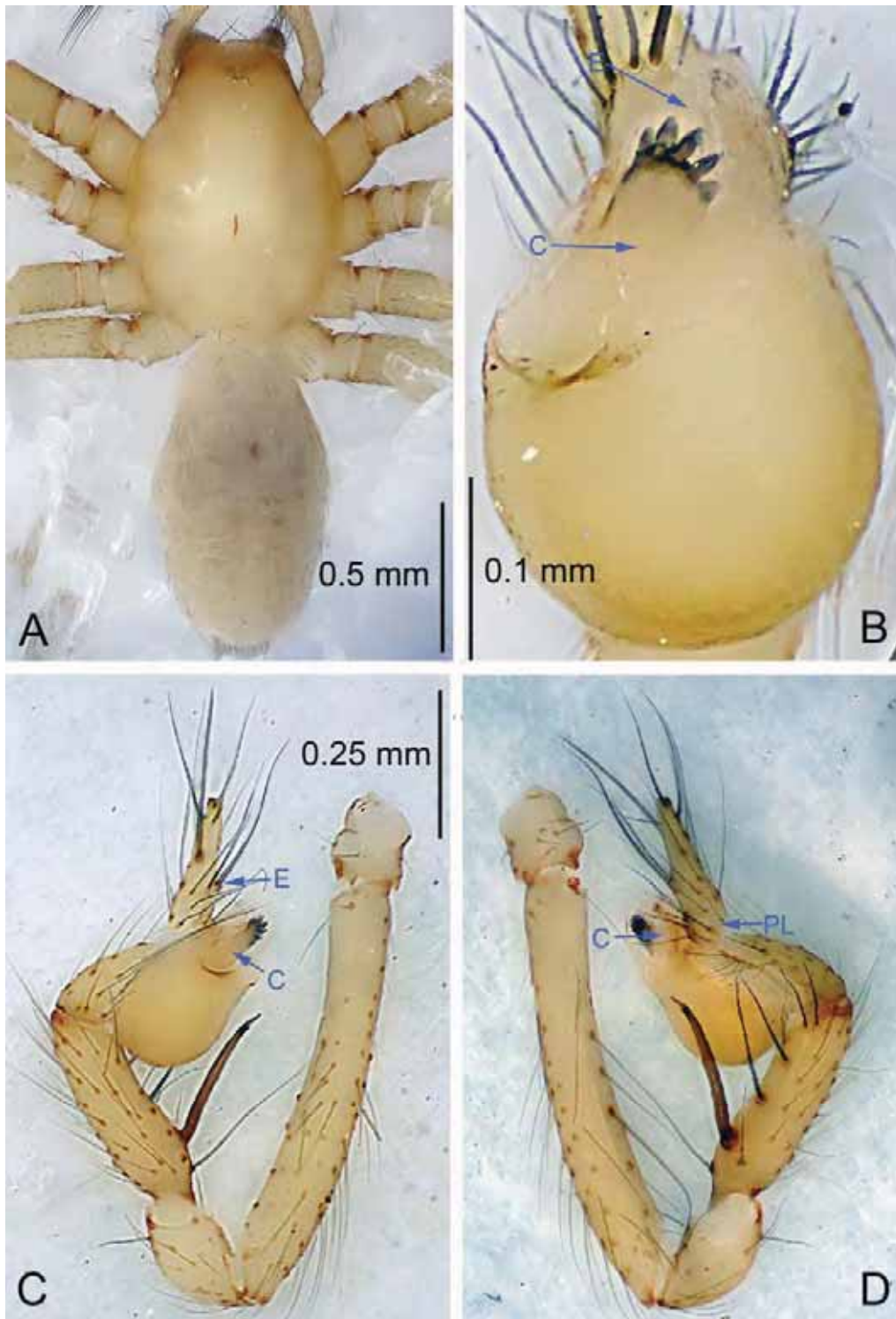
**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.40 (Figs 87A–B). Carapace 1.00 long, 0.88 wide. Opisthosoma 1.25 long, 1.00 wide. Clypeus 0.13 high. Leg measurements: I 9.51 (2.50, 0.38, 3.00, 2.13, 1.50); II 7.38 (2.00, 0.38, 2.13, 1.62, 1.25); III 6.35 (1.75, 0.35, 1.75, 1.50, 1.00); IV 8.06 (2.25, 0.38, 2.30, 1.88, 1.25). Vulva (Fig. 87C): spermathecae coiled, atrium triangular, and anterior margin of atrium with short hairs.

**Distribution.** China (Guizhou).

***Leptonetela chuan* Wang & Li sp. nov.**  
**Figs 88–89, 97**

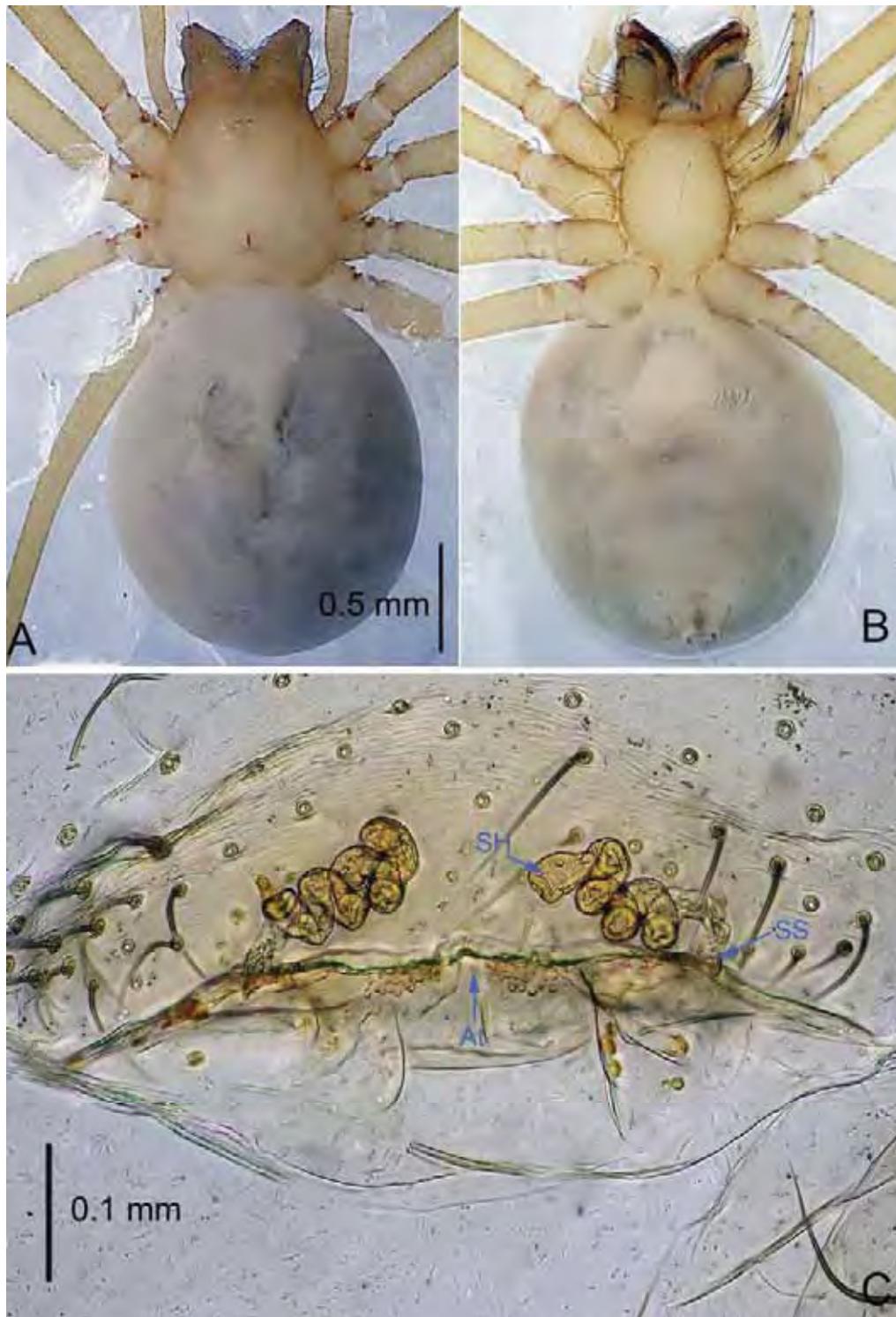
**Type material. Holotype:** male (IZCAS), Chuan Cave, 27.08°N, 105.67°E, Yangchangba Town, Dafang County, Guizhou Province,





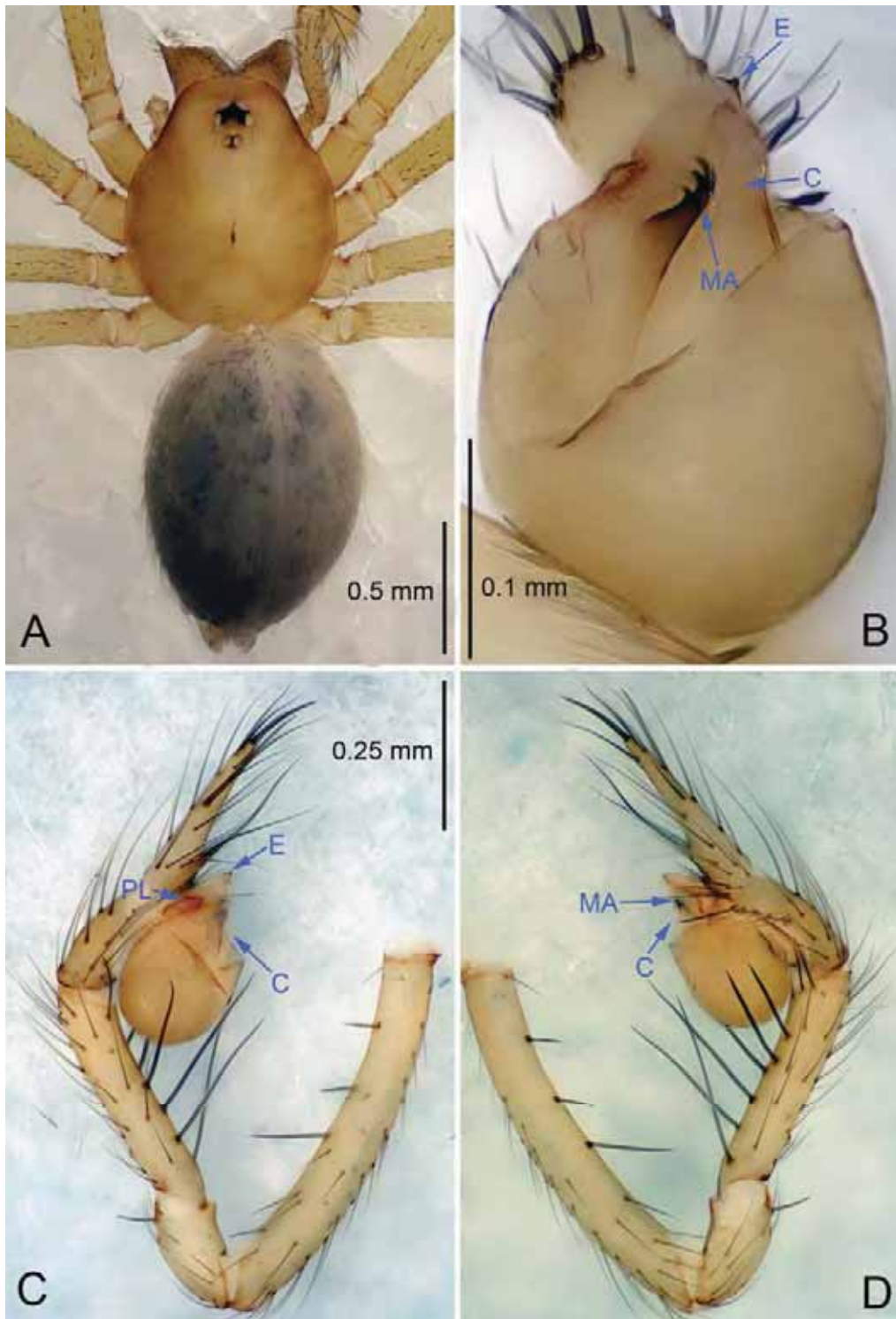
**FIGURE 84** *Leptonetela erlong* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



**FIGURE 85** *Leptonetela erlong* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

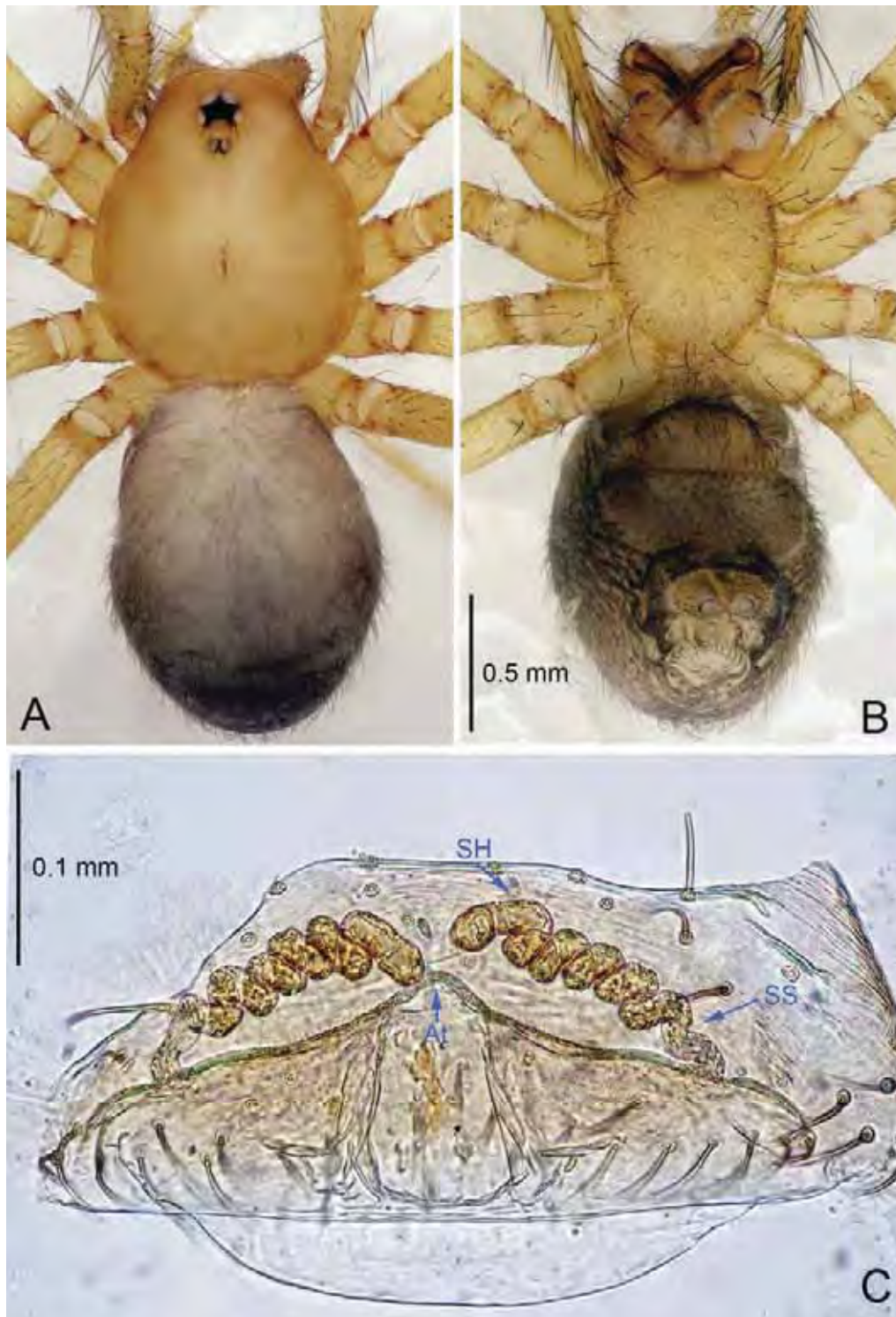




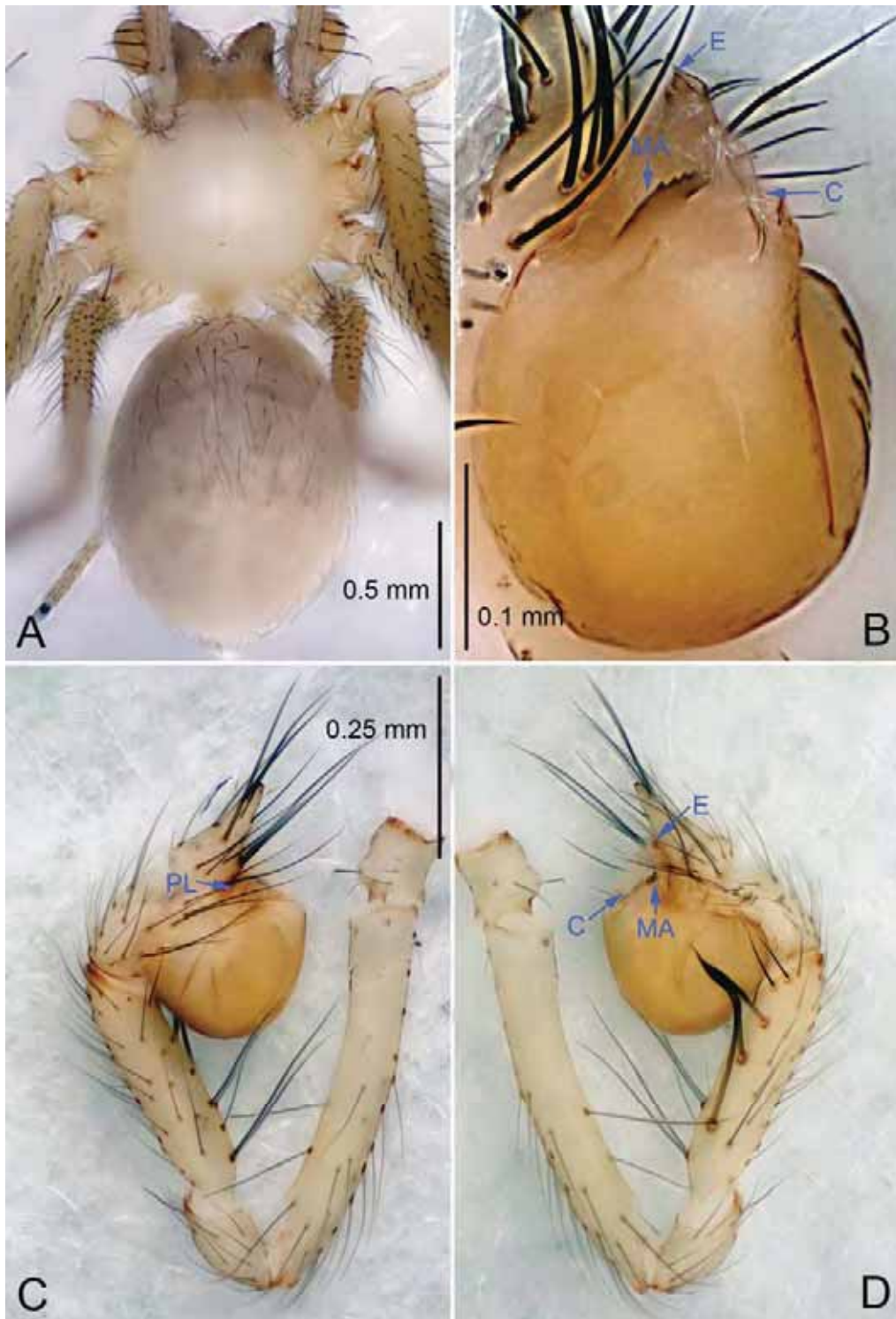
**FIGURE 86** *Leptonetela dabian* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





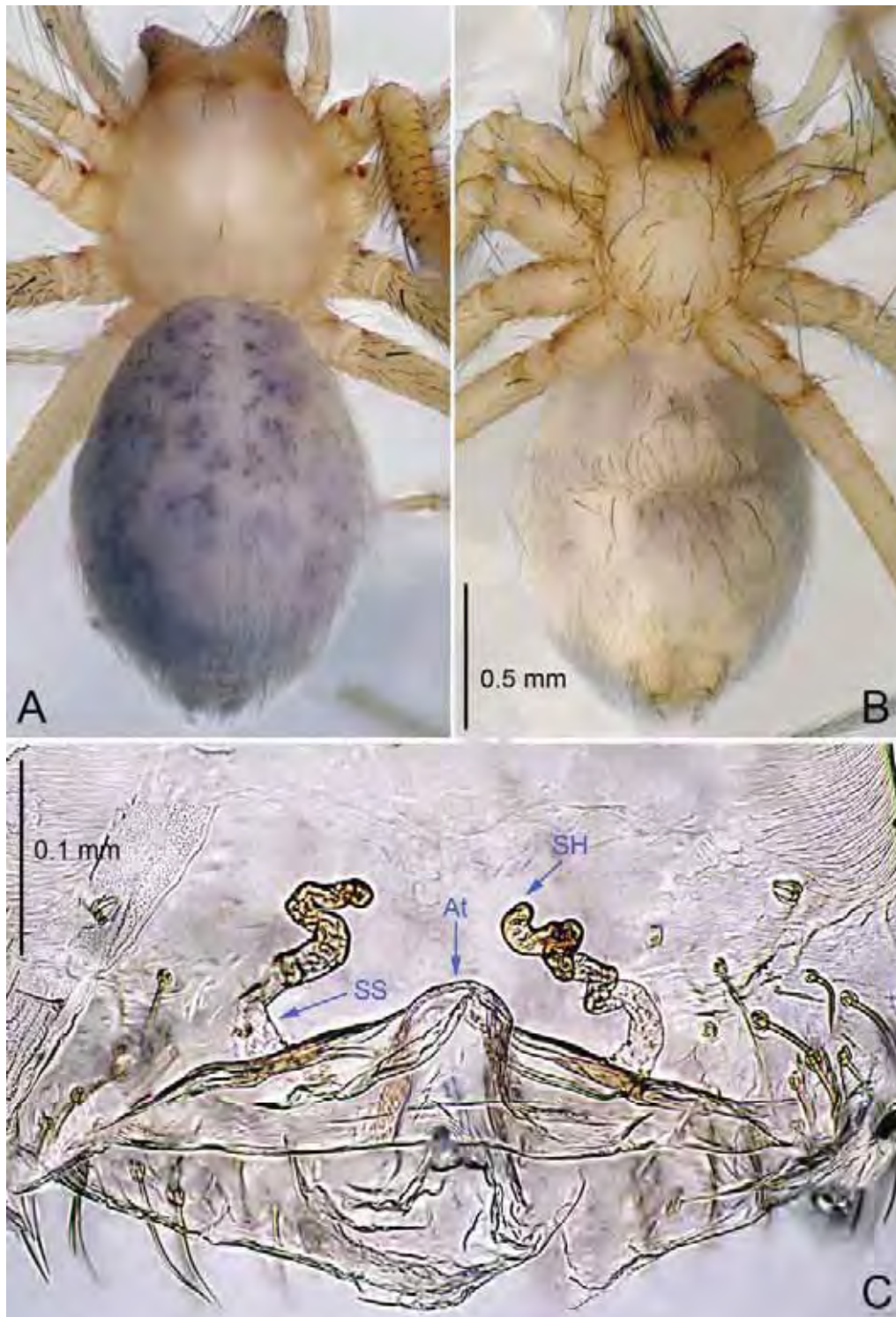
**FIGURE 87** *Leptonetela dabian* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



**FIGURE 88** *Leptonetela chuan* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.





**FIGURE 89** *Leptonetela chuan* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



China, 13 March 2011, H. Chen & Z. Zha leg. **Paratype:** 1 female, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. thracia* Wang & Li, 2011, *L. dabian* Wang & Li sp. nov., but can be distinguished by the male pedipalpal tibia with 7 long setae prolaterally, 5 slender spines retrolaterally, with I, II, III spines equally strong, stronger than others (Fig. 88D) (tibia with 4 long setae prolaterally, 5 slender spines retrolaterally, with I, II spines equally strong, stronger than others in *L. thracia*; 3 slender spines prolaterally, 5 slender retrolaterally spines equally strong in *L. dabian* Wang & Li sp. nov.); tip of median apophysis bend downwards, with 5 larger teeth distally (Fig. 88B) (tip of median apophysis not bend, with 4 teeth distally in *L. thracia*; tip of median apophysis bend upwards, with 3 larger teeth distally in *L. dabian* Wang & Li sp. nov.); from *L. dabian* Wang & Li sp. nov. by the conductor triangular (Fig. 88B) (conductor thin, tongue-shaped in *L. dabian* Wang & Li sp. nov.).

**Description. Male (holotype).** Total length 2.10 (Fig. 88A). Carapace 0.83 long, 0.90 wide. Opisthosoma 1.18 long, 1.05 wide. Carapace whitish. Ocular area with a pair of setae, eyes absent. Median groove, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma gray, ovoid. Leg measurements: I 8.79 (2.38, 0.38, 2.50, 2.13, 1.40); II 7.77 (2.13, 0.38, 2.18, 1.78, 1.30); III 7.51 (1.78, 0.35, 2.10, 1.73, 1.55); IV 8.36 (2.25, 0.38, 2.38, 2.00, 1.35). Male pedipalp (Figs 88C–D): tibia with 7 long setae prolaterally, 5 large spines retrolaterally, with I, II, III spines equally strong, stronger than others. Cymbium constricted medially, attaching a small earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe oval. Median apophysis bend downwards, with 5 larger teeth distally. Conductor triangular in ventral view (Fig. 88B).

**Female:** Similar to male in color and general features, but smaller and with shorter legs. Total length 2.08 (Figs 89A–B). Carapace 0.78 long, 0.88 wide. Opisthosoma 1.33 long, 1.03 wide. Clypeus 0.15 high. Leg measurements: I 8.31 (2.33, 0.38, 2.40, 1.85, 1.35); II 7.21 (2.10, 0.35, 2.08, 1.58, 1.10); III 6.92 (1.93, 0.35, 1.88, 1.63, 1.13); IV 8.14 (2.30, 0.38, 2.38, 1.83, 1.25). Vulva (Fig. 89C): spermathecae loosely coiled, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela lihu* Wang & Li sp. nov.**  
Figs 90–91, 97

**Type material. Holotype:** male (IZCAS), nameless Cave, 25.10°N, 107.65°E, Lihu Town, Nandan County, Hechi City, Guangxi Zhuang Autonomous Region, China, 31 January 2015, Y. Li & Z. Chen leg. **Paratypes:** 2 males and 5 females, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. notabilis* (Lin & Li, 2010), *L. sexdigiti* (Lin & Li, 2010); and *L. shuang* Wang & Li sp. nov., but can be separated from *L. notabilis* by the male pedipalpal tibial I spine bifurcate (Fig. 90D) (tibial I spine trifurcate in *L. notabilis*); from *L. shuang* Wang & Li sp. nov. by the conductor C tile-shaped, distal edge of median apophysis with 6 teeth (Fig. 90B) (conductor triangular, distal edge of median apophysis with 7 teeth in *L. shuang* Wang & Li sp. nov.); from *L. sexdigiti* by the female spermathecae strongly twisted (spermathecae loosely twisted in *L. sexdigiti*).

**Description. Male (holotype).** Total length 2.13 (Fig. 90A). Carapace 1.00 long, 0.88 wide. Opisthosoma 1.12 long, 0.75 wide. Carapace yellowish. Ocular area with 3 long setae, eyes six, reduced to white spots. Median groove needle-shaped, cervical grooves and radial furrows distinct. Clypeus 0.13 high. Opisthosoma gray, ovoid. Leg measurements: I 8.23 (2.25, 0.25, 2.38, 1.95, 1.40); II 7.00 (2.00, 0.25, 2.00, 1.63, 1.12); III 6.10 (1.75, 0.20, 1.75, 1.45, 0.95); IV 7.75 (2.10, 0.25, 2.25, 1.90, 1.25). Male pedipalp (Figs 90C–D): basal of tibia swollen, tibia with 5 spines retrolaterally, with I spine strongest, longest, bifurcate and located at the base of tibia. Cymbium constricted medially, attaching a small earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe oval. Median apophysis long and thin, with 6 small teeth distally. Conductor broad, C tile-shaped in ventral view (Fig. 90B).

**Female (one of the paratypes).** Similar to male in color and general features, but larger and with shorter legs. Total length 2.50 (Figs 91A–B). Carapace 1.25 long, 0.75 wide. Opisthosoma 1.40 long, 1.00 wide. Clypeus 0.12 high. Leg measurements: I 8.00 (2.25, 0.25, 2.38, 1.75, 1.37); II 7.00 (2.00, 0.25, 2.00, 1.50, 1.25); III 5.65 (1.75, 0.20, 1.65, 1.15, 0.90); IV 7.70 (2.10, 0.25, 2.25, 1.90, 1.20). Vulva (Fig. 91C): spermathecae coiled, atrium fusiformed.

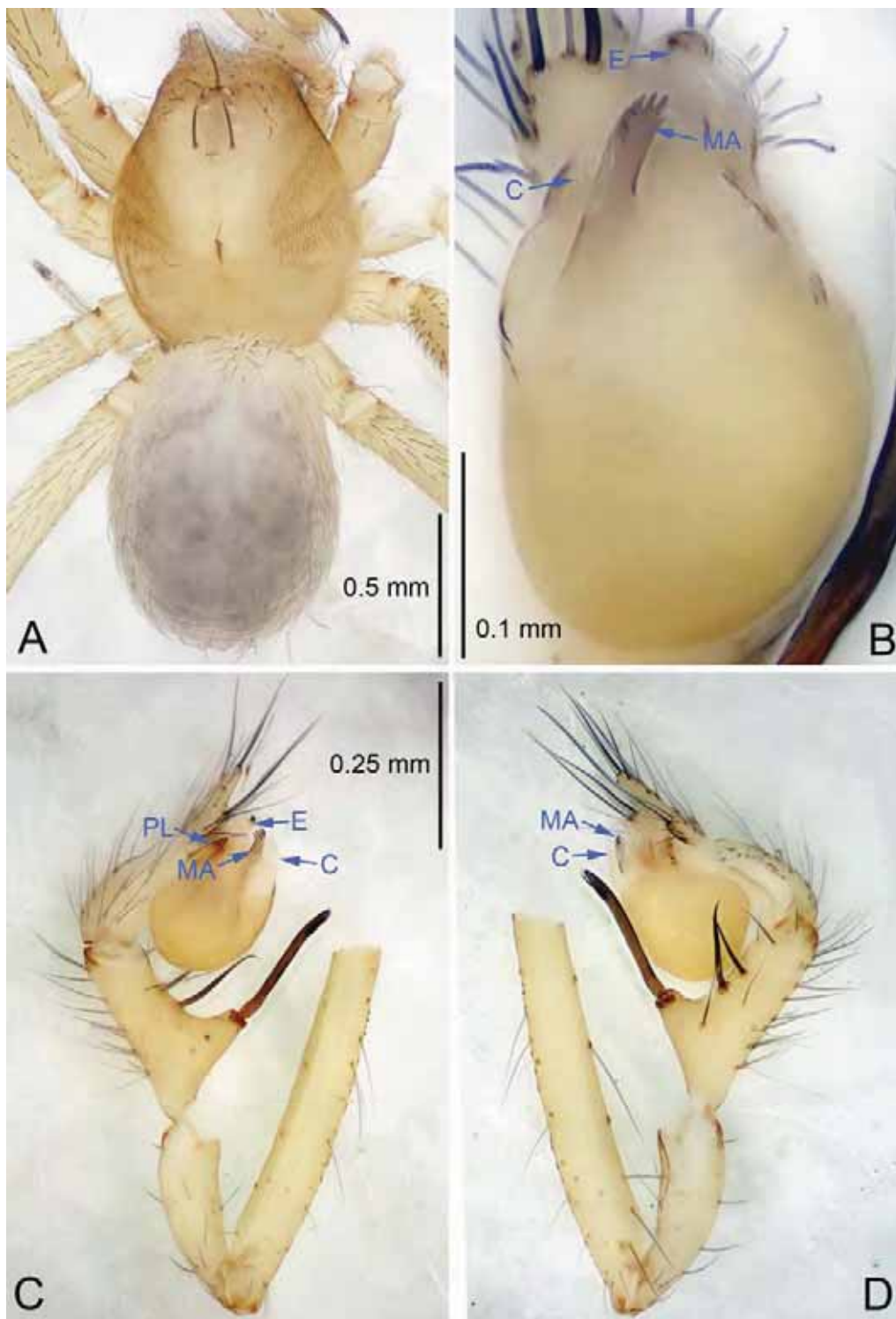
**Distribution.** China (Guangxi).

***Leptonetela shuang* Wang & Li sp. nov.**  
Figs 92–93, 97

**Type material. Holotype:** male (IZCAS), Shuang Cave, 25.93°N, 107.26°E, Bailong Town, Pingtang County, Qiannan Prefecture, Guizhou Province, China, 24 July 2012, H. Zhao leg. **Paratypes:** 2 females, same data as holotype; 2 males and 6 females, Dongkou Cave, 25.93°N, 107.25°E, Longxiang, Bailong Town, Pingtang County, Qiannan Prefecture, Guizhou Province, China, 25 July 2012, H. Zhao leg.

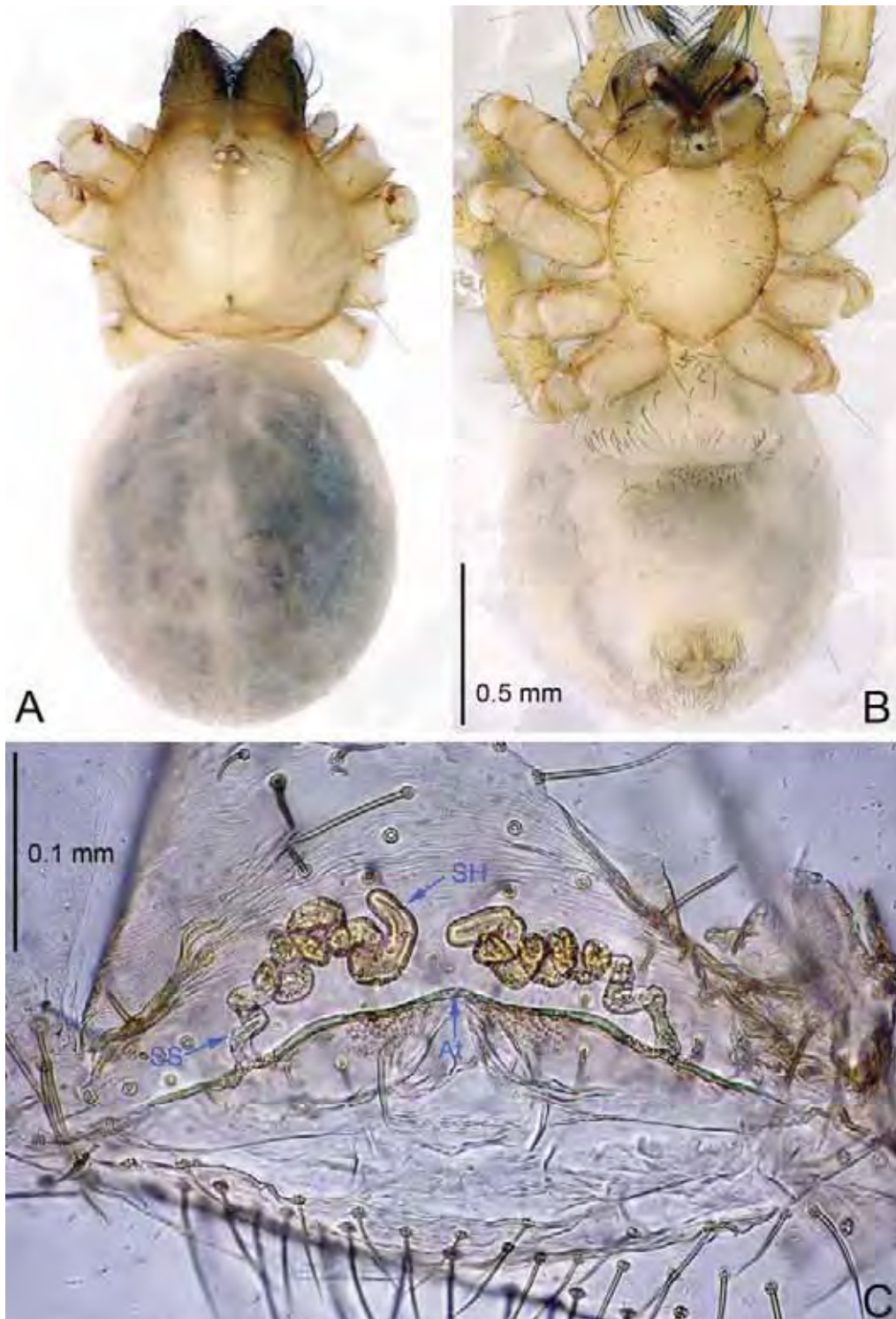
**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. notabilis* (Lin & Li, 2010), *L. sexdigiti* (Lin & Li, 2010), and *L. lihu* Wang & Li sp. nov., but can be separated from *L. notabilis* by the male pedipalp tibial I spine bifurcate (Fig. 92D) (tibial I spine trifurcate in *L. notabilis*); from *L. sexdigiti* and *L. lihu* Wang & Li sp. nov. by the conductor triangular, distal edge of median apophysis



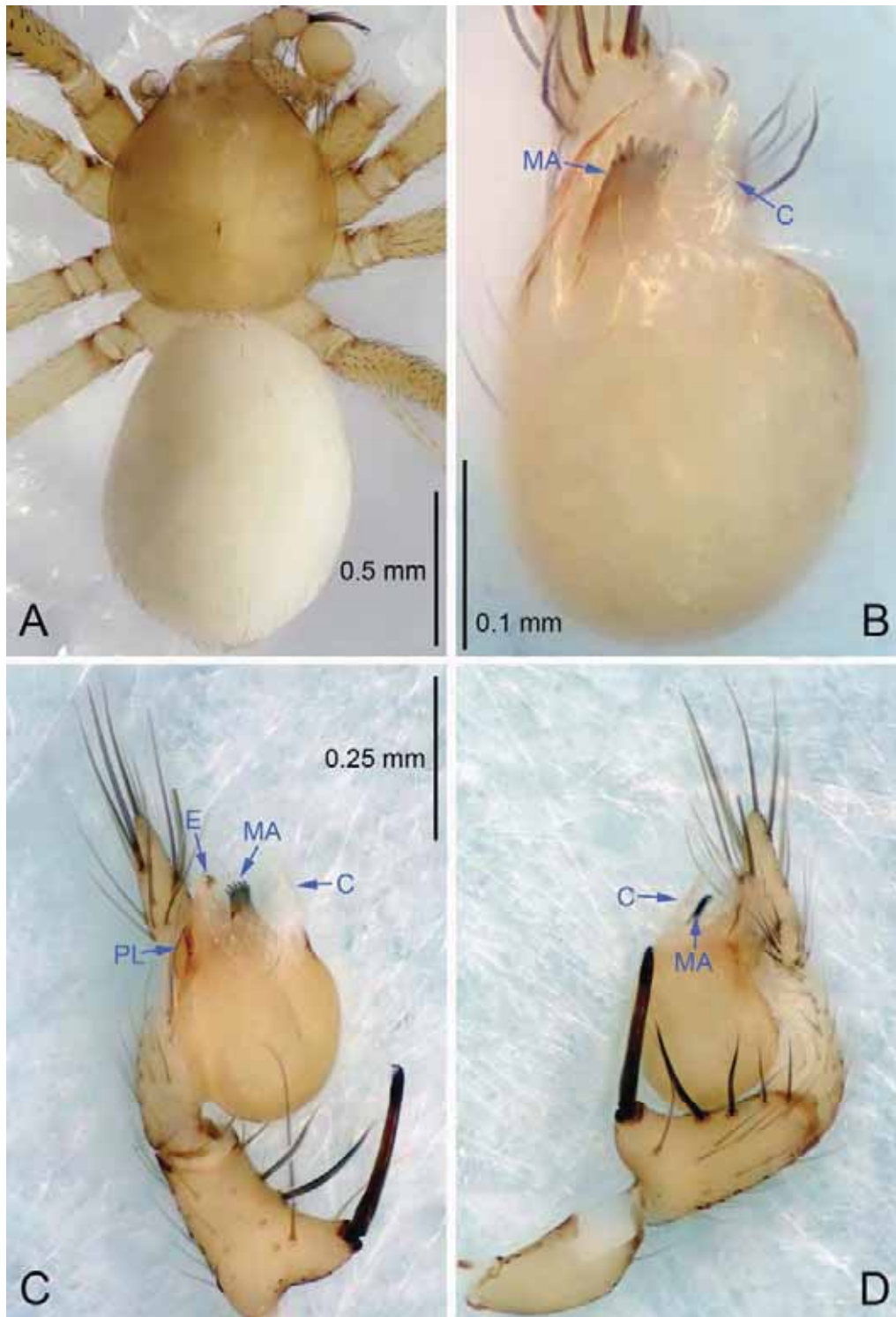
**FIGURE 90** *Leptonetela lihu* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.

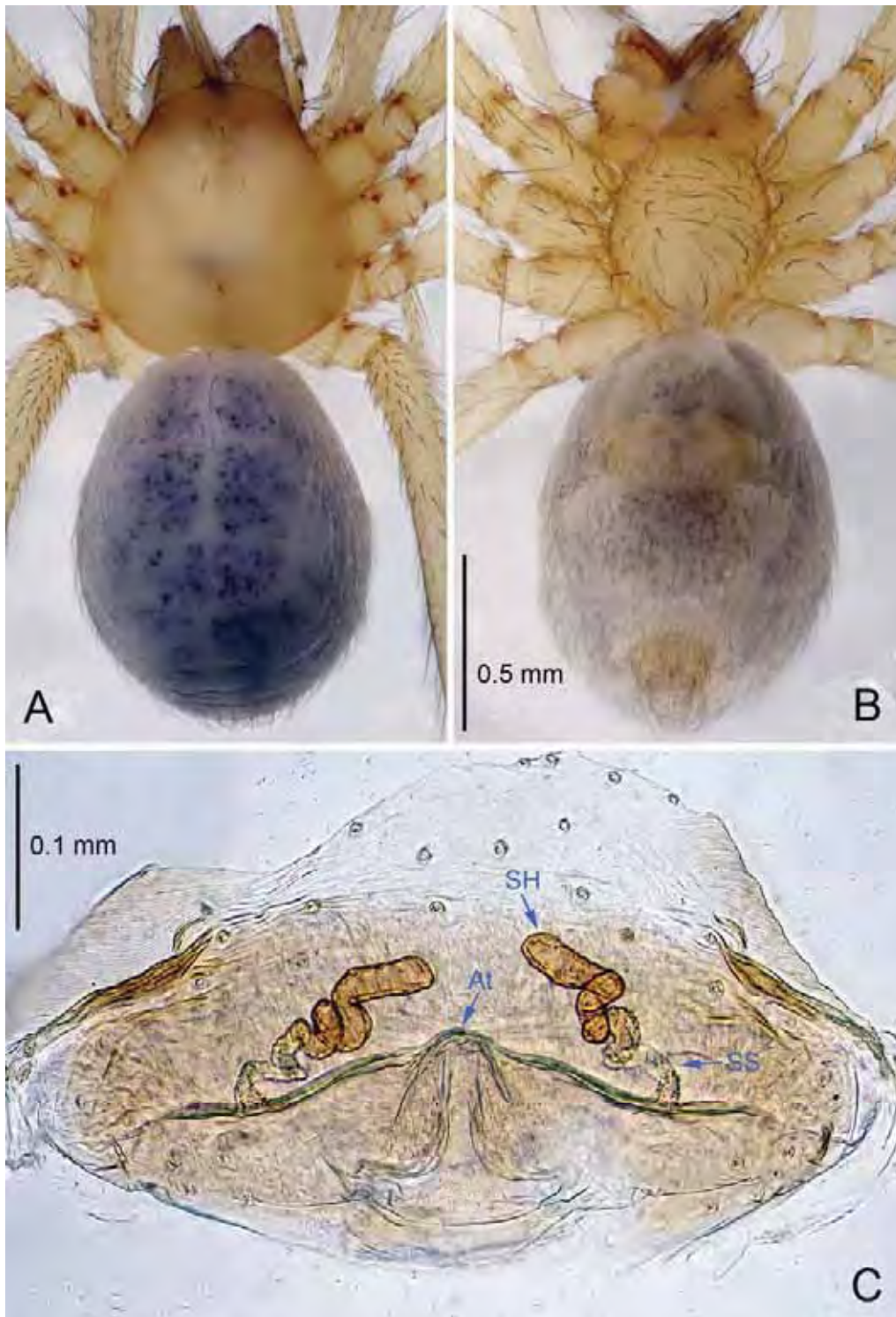


**FIGURE 91** *Leptonetela lihu* sp. nov., one of paratype females  
 A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.





**FIGURE 92** *Leptonetela shuang* sp. nov., holotype male  
 A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



**FIGURE 93** *Leptonetela shuang* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.

with 7 teeth (Fig. 92B) (conductor C tile-shaped, distal edge of median apophysis with 6 teeth in *L. sexdigiti* and *L. lihu* Wang & Li sp. nov.); from *L. sexdigiti* by in the female spermathecae strongly twisted (Fig. 93C) (spermathecae loosely twisted in *L. sexdigiti*).

**Description. Male (holotype).** Total length 2.00 (Fig. 92A). Carapace 0.83 long, 0.75 wide. Opisthosoma 1.25 long, 0.80 wide. Carapace yellow. Ocular area with a pair of setae, eyes absent. Median groove needle-shaped, cervical grooves and radial furrows indistinct. Clypeus 0.13 high. Opisthosoma whitish, ovoid. Leg measurements: I 7.74 (2.03, 0.38, 2.25, 1.80, 1.28); II 6.65 (1.77, 0.35, 1.83, 1.50, 1.20); III 5.68 (1.57, 0.35, 1.50, 1.28, 0.98); IV 7.38 (1.92, 0.38, 2.05, 1.78, 1.25). Male pedipalp (Figs 92C–D): basal of tibia swollen, tibia with 3 long setae prolaterally, 1 long setae and 5 spines retrolaterally, with I spine strongest, longest, bifurcate and located at the base of tibia. Cymbium constricted medially, attaching a small earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe oval. Median apophysis long and thin, with 7 small teeth distally. Conductor triangular (Fig. 92B).

**Female (one of the paratypes).** Similar to male in color and general features, but smaller and with shorter legs. Total length 1.98 (Figs 93A–B). Carapace 0.88 long, 0.75 wide. Opisthosoma 1.13 long, 0.88 wide. Clypeus 0.13 high. Leg measurements: I 7.34 (1.93, 0.38, 2.13, 1.65, 1.25); II 6.41 (1.75, 0.35, 1.78, 1.50, 1.03); III 5.50 (1.52, 0.35, 1.45, 1.30, 0.88); IV 7.03 (1.87, 0.38, 2.05, 1.63, 1.10). Vulva (Fig. 93C): spermathecae coiled, atrium triangular.

**Distribution.** China (Guizhou).

***Leptonetela encun* Wang & Li sp. nov.**  
Figs 94–95, 97

**Type material. Holotype:** male (IZCAS), Encun Cave, 25.08°N, 107.59°E, En, Chengguan Town, Nandan County, Hechi City, Guangxi Zhuang Autonomous Region, China, 30 Jan 2015, Y. Li & Z. Chen leg. **Paratypes:** 1 male and 1 female, same data as holotype.

**Etymology.** The specific name refers to the type locality; noun.

**Diagnosis.** This new species is similar to *L. robustispina* (Chen et al., 2010) but can be distinguished by the male pedipalpal tibia with 5 spines retrolaterally, with I spine longest, I, II, III spines equally strong, stronger than others (Fig. 94D), distal edge of median apophysis linear-shaped, with 8 teeth (Fig. 94B) (tibia with 5 spines retrolaterally, with I spine longest, distal edge of median apophysis semicircular, with 12 teeth in *L. robustispina*).

**Description. Male (holotype).** Total length 2.00 (Fig. 94A). Carapace 0.90 long, 0.75 wide. Opisthosoma 1.25 long, 0.88 wide. Carapace yellowish, with one seta on the median part. Eyes six. Median groove needle-shaped, cervical grooves and

radial furrows indistinct. Clypeus 0.10 high. Opisthosoma gray, ovoid. Leg measurements: I - (1.88, -, -, -); II 6.25 (1.75, 0.25, 1.87, 1.38, 1.00); III 4.96 (1.38, 0.20, 1.38, 1.20, 0.80); IV 6.86 (2.00, 0.25, 1.88, 1.63, 1.10). Male pedipalp (Figs 94C–D): tibia with a few clusters of short spines dorsally, 8 long setae retrolaterally, and 5 spines retrolaterally, spine I longest. Cymbium constricted medially, attaching a small earlobe-shaped process retrolaterally. Embolus triangular, prolateral lobe indistinct. Median apophysis harrow-like, distal edge round, decorated with 8 small teeth. Conductor triangular in ventral view (Fig. 94B).

**Female:** Similar to male in color and general features, but larger and with shorter legs. Total length 2.13 (Figs 95A–B). Carapace 0.88 long, 0.75 wide. Opisthosoma 1.00 long, 1.05 wide. Clypeus 0.11 high. Leg measurements: I 6.50 (1.75, 0.25, 2.00, 1.50, 1.00); II 5.01 (1.38, 0.25, 1.50, 1.13, 0.75); III 4.45 (1.25, 0.20, 1.25, 1.00, 0.75); IV 5.52 (1.50, 0.25, 1.62, 1.25, 0.90). Vulva (Fig. 95C): spermathecae coiled, atrium fusiformed.

**Distribution.** China (Guangxi).

***Leptonetela zhai* Wang & Li, 2011**  
Figs 96, 97

*Leptonetela zhai* Wang & Li, 2011: 17, figs 69A–D, 70A–B, 71C–D.

**Material examined.** 4 female (IZCAS), Rudong Cave, 25.57°N, 110.62°E, Longpan Mountain, Dongtian, Hucheng Town, Xing'an County, Guilin City, Guangxi Zhuang Autonomous Region, China, 08 Nov 2012, Z. Chen & Z. Zhao leg.

**Description.** Male. See Wang & Li (2011).

**Female.** Total length 2.12 (Figs 96A–B). Carapace 0.80 long, 0.73 wide. Opisthosoma 1.27 long, 0.85 wide. Clypeus 0.12 high. Leg measurements: I 6.61 (1.62, 0.37, 1.65, 1.87, 1.10); II 5.39 (1.77, 0.30, 1.25, 1.12, 0.95); III 4.16 (1.12, 0.27, 1.02, 1.00, 0.75); IV 5.72 (1.50, 0.30, 1.55, 1.35, 1.02). Vulva (Fig. 96C): spermathecae coiled, atrium fusiformed, anterior margin of atrium with short hairs.

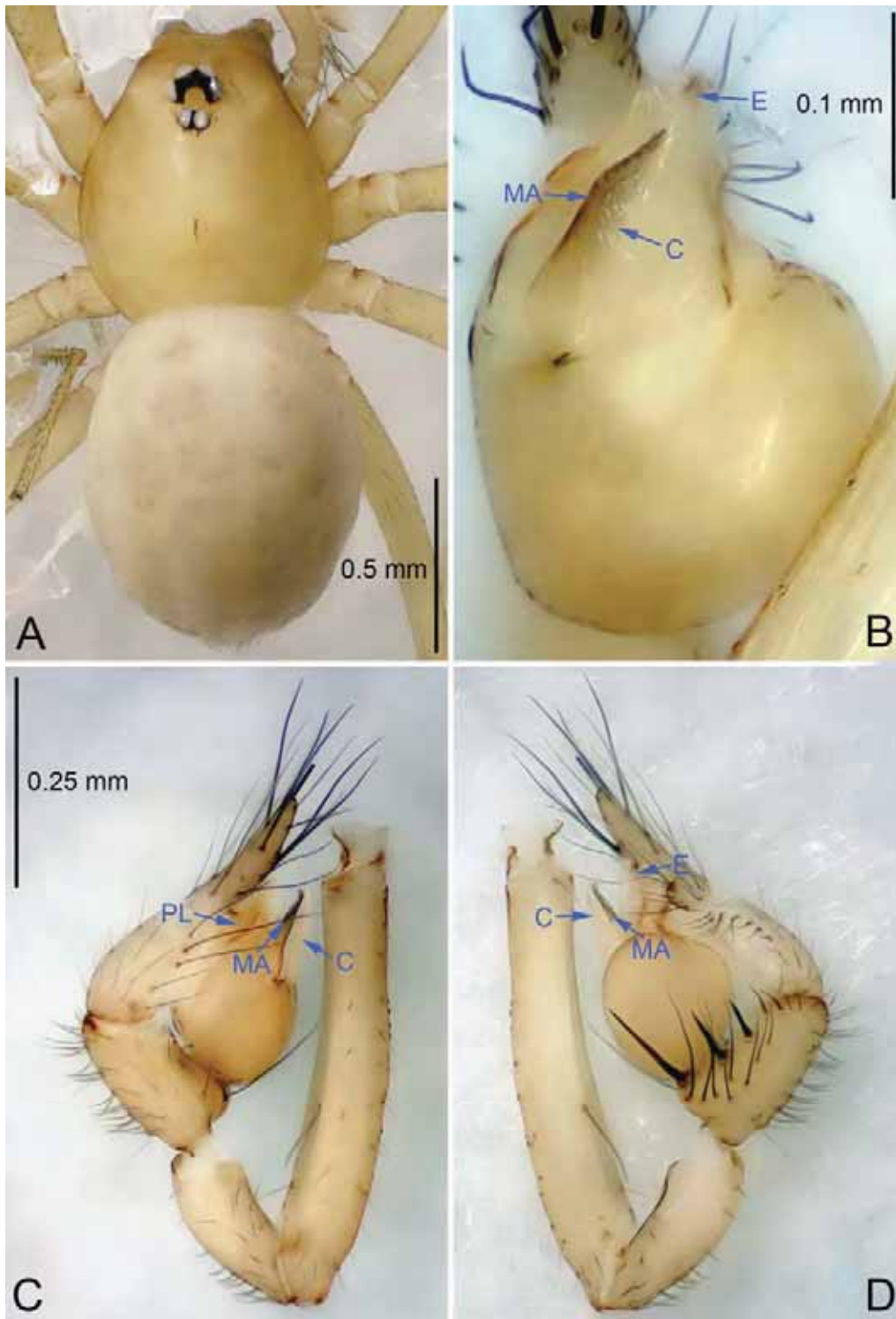
**Distribution.** China (Guangxi).

**Remarks.** Female of the species is reported for the first time. Female of *Leptonetela zhai* were collected from the same cave of holotype male *L. zhai* Wang & Li, 2011.

***Leptonetela tianxinensis* (Tong & Li, 2008) comb. nov.**  
*Leptoneta tianxiensis* Tong & Li, 2008: 382, figs 5A–G (♂♀).

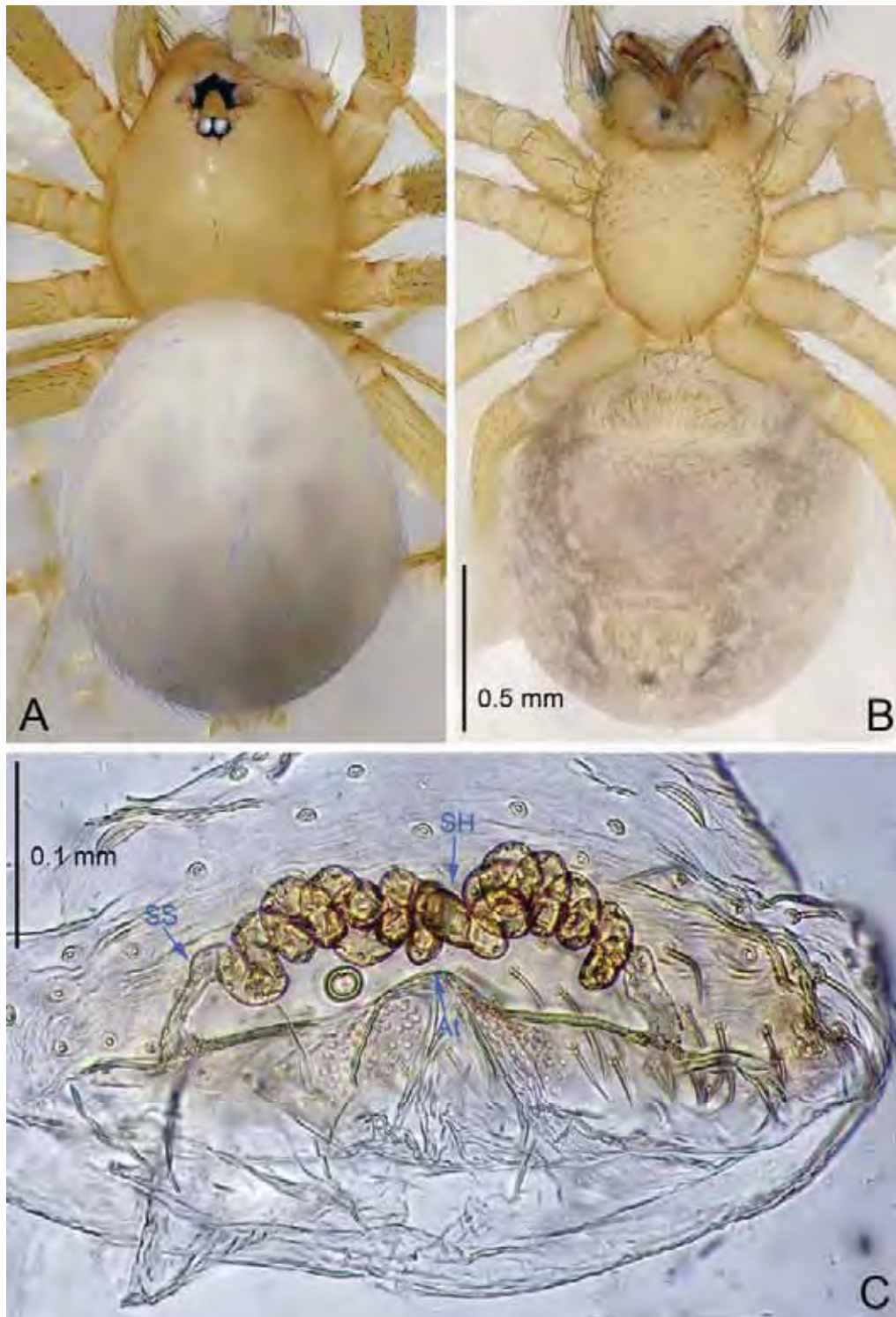
**Type material examined.** Paratypes: 12 males, 6 females (IZCAS), Tianxin Cave, 33.35°N, 111.88°E, Sandaohu, Qilipo Town, Neixiang County, Henan Province, China, 24 Jun 2005, Q. Wang & Y. Tong leg.





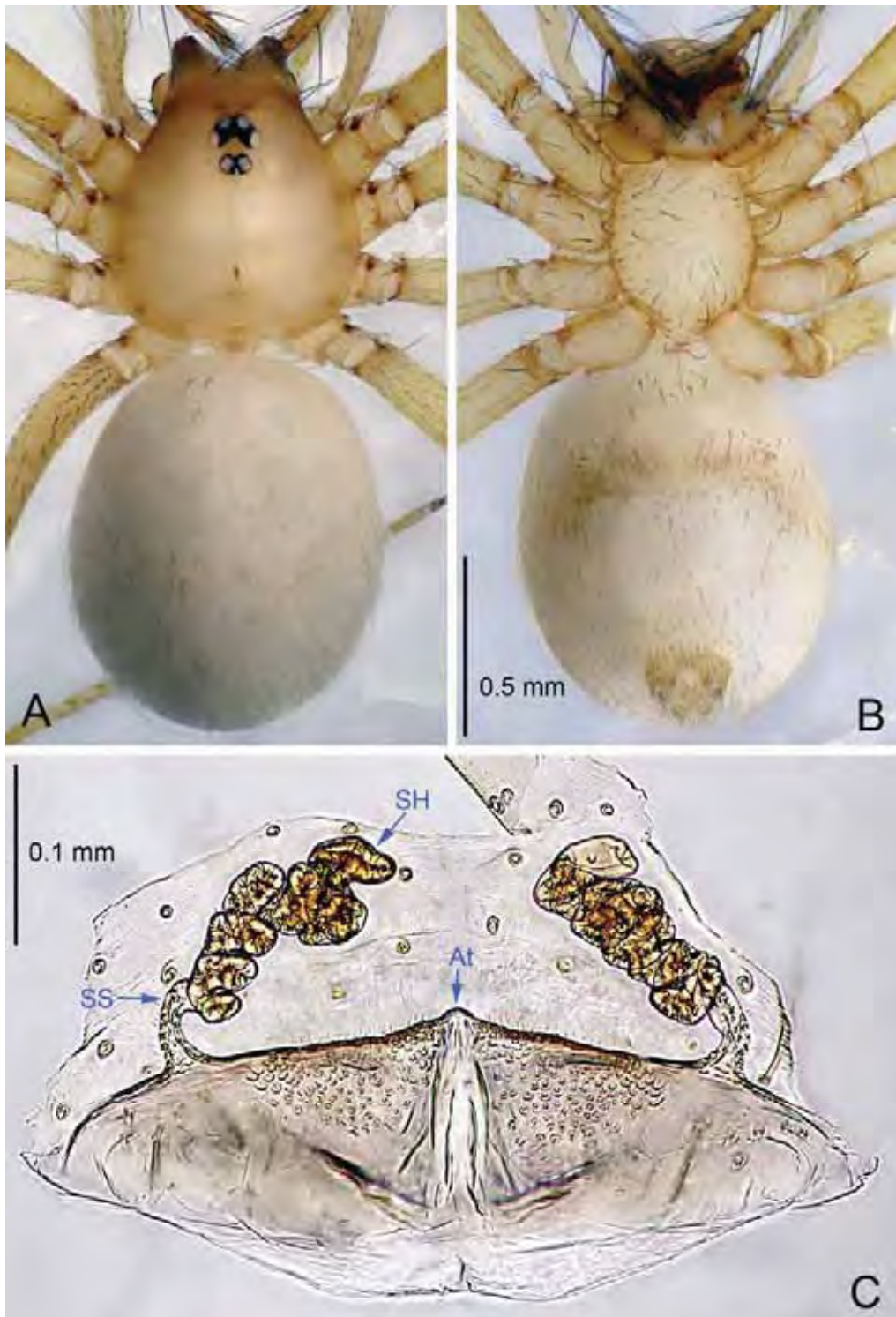
**FIGURE 94** *Leptonetela encun* sp. nov., holotype male

A: Habitus, dorsal view; B: Palpal bulb, ventral view; C: Palp, prolateral view; D: Palp, retrolateral view.



**FIGURE 95** *Leptonetela encun* sp. nov., one of paratype females  
A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.





**FIGURE 96** *Leptonetela zhai* Wang et Li, 2011, one female from the type locality  
 A: Habitus, dorsal view; B: Habitus, ventral view; C: Spermatheca, dorsal view.



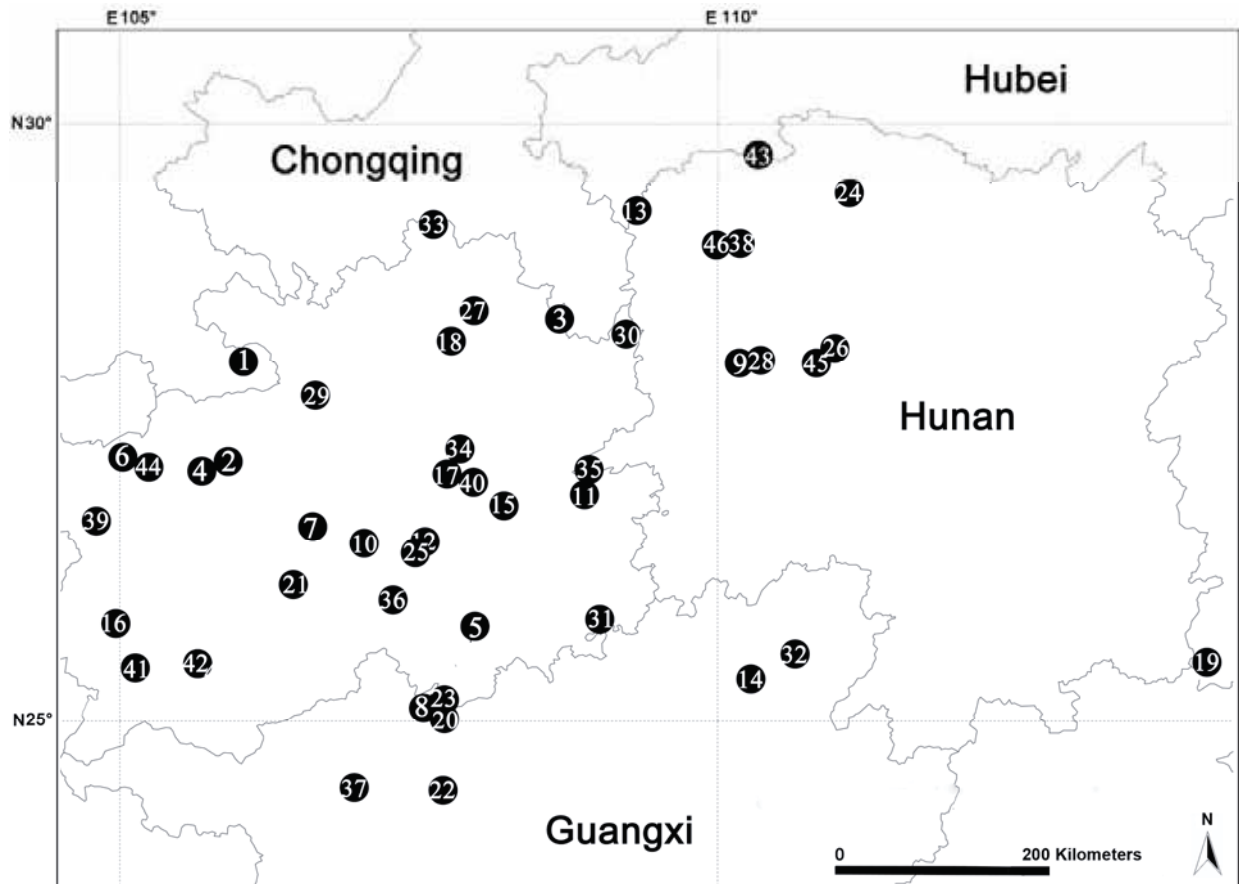


FIGURE 97 Locality records for forty-six new species of *Leptonetela* in China

1: *L. chakou* sp. nov. (Sichuan, China); 2: *L. changtu* sp. nov. (Guizhou, China); 3: *L. chenjia* sp. nov. (Guizhou, China); 4: *L. chuan* sp. nov. (Guizhou, China); 5: *L. dabian* sp. nov. (Guizhou, China); 6: *L. dao* sp. nov. (Guizhou, China); 7: *L. dashui* sp. nov. (Guizhou, China); 8: *L. encun* sp. nov. (Guangxi, China); 9: *L. erlong* sp. nov. (Hunan, China); 10: *L. feilong* sp. nov. (Guizhou, China); 11: *L. gang* sp. nov. (Guizhou, China); 12: *L. gubin* sp. nov. (Guizhou, China); 13: *L. huoyan* sp. nov. (Hubei, China); 14: *L. jiahe* sp. nov. (Guangxi, China); 15: *L. kangsa* sp. nov. (Guizhou, China); 16: *L. la* sp. nov. (Guizhou, China); 17: *L. langdong* sp. nov. (Guizhou, China); 18: *L. liangfeng* sp. nov. (Guizhou, China); 19: *L. lianhua* sp. nov. (Jiangxi, China); 20: *L. lihu* sp. nov. (Guangxi, China); 21: *L. liuguan* sp. nov. (Guizhou, China); 22: *L. liuzhai* sp. nov. (Guangxi, China); 23: *L. longli* sp. nov. (Guangxi, China); 24: *L. longyu* sp. nov. (Hunan, China); 25: *L. lujia* sp. nov. (Guizhou, China); 26: *L. meiwang* sp. nov. (Hunan, China); 27: *L. mayang* sp. nov. (Guizhou, China); 28: *L. nanmu* sp. nov. (Guizhou, China); 29: *L. niubizi* sp. nov. (Guizhou, China); 30: *L. panbao* sp. nov. (Guizhou, China); 31: *L. qiangdao* sp. nov. (Guizhou, China); 32: *L. rudong* sp. nov. (Guangxi, China); 33: *L. sanyan* sp. nov. (Guizhou, China); 34: *L. shanji* sp. nov. (Guizhou, China); 35: *L. shicheng* sp. nov. (Hunan, China); 36: *L. shuang* sp. nov. (Guizhou, China); 37: *L. shuilian* sp. nov. (Guangxi, China); 38: *L. tawo* sp. nov. (Hunan, China); 39: *L. tiankeng* sp. nov. (Guizhou, China); 40: *L. wangjia* sp. nov. (Guizhou, China); 41: *L. wenzhu* sp. nov. (Guizhou, China); 42: *L. wuming* sp. nov. (Guizhou, China); 43: *L. xianren* sp. nov. (Hubei, China); 44: *L. xiaoyan* sp. nov. (Guizhou, China); 45: *L. xinhua* sp. nov. (Hunan, China); 46: *L. zakou* sp. nov. (Hunan, China).

**Remarks.** Our studies showed that this species should be transferred to the genus *Leptonetela*, based on the result of DNA barcoding and the morphology characters that the pedipalpal femur spineless, tibia with one strong spine retrolaterally.

***Leptonetela gigachela* (Lin & Li, 2010) comb. nov.**  
*Guineta gigachela* Lin & Li, 2010: 6, figs 1A, 2A–E, 3A–B (♂♀).

**Type material. Holotype:** male (IZCAS), Qingzi Cave, 26.51°N,

107.99°E, Mianxi, Sankeshu Town, Kaili City, Guizhou Province, China, 26 May 2007, Y. Li & J. Liu leg. **Paratypes:** 2 males and 12 females, same data as holotype.

**Remarks.** Our studies showed that that *Guineta* Lin & Li, 2010 syn. nov. should be a junior synonym of *Leptonetela* Kratochvíl, 1978.

***Leptonetela notabilis* (Lin & Li, 2010) comb. nov.**  
*Sinoneta notabilis* Lin & Li, 2010: 83, figs 55A–B, 56A–C, 57A–C (♂♀).

**Type material. Holotype:** male (IZCAS), Hebiandong Cave, Kaikou Town, Duyun City, 26.00°N, 107.20°E, Guizhou Province, China, 8 May 2006, Y. Li leg. **Paratypes:** 1 male and 1 female, same data as holotype.

**Remarks.** Our studies showed that *Sinoneta* Lin & Li, 2010 syn. nov. should be a junior synonym of *Leptonetela* Kratochvil, 1978.

***Leptonetela sexdigiti* (Lin & Li, 2010) comb. nov.**

*Sinoneta sexdigiti* Lin & Li, 2010: 87, figs 58A–B, 59A–B, 60A–B (♂♀).

**Type material. Holotype:** male (IZCAS), Qiaotou Cave, Dashan, Shuangliu Town, Kaiyang County, 26.05°N, 107.85°E, Guizhou Province, China, 11 May 2006, Y. Li & Z. Yang leg. **Paratypes:** 5 males and 29 females, same data as holotype.

***Leptonetela sanchahe* nom. nov.**

*Qianleptoneta palmata* Chen, Jia & Wang, 2010: 2902, fig. 19A–G, 20A–F, 25G (♂♀).

*Sinoneta palmata* Wang & Li, 2011: 4 (Transfer from *Qianleptoneta*).

**Material examined.** 1 male and 1 female (IZCAS), Sanchahe Cave, 26.53°N, 107.70°E, Sanchahe, Jialiang Town, Libo County, Guizhou Province, China, 16 May 2011, C. Wang & L. Lin leg.

**Remarks.** *Qianleptoneta palmata* was collected from Sanchahe Cave in Guizhou, China and published by Chen et al at December 2010. Wang & Li (2011) transferred *Qianleptoneta palmata* Chen et al, 2010 to the genus *Sinoneta* Lin & Li, 2010. Nevertheless, in this study our results confirmed that *Qianleptoneta palmata* belonged to the genus *Leptonetela*.

*Leptonetela palmata* is a preoccupied name for a species collected from Dixian Cave in Guizhou, China and published by Lin & Li, at August 2010. Consequently, *Leptonetela sanchahe* nom. nov. is proposed for the taxon from Sanchahe Cave, in Guizhou, China.

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