A new species of the genus *Songthela* from Guizhou Province, China (Araneae: Mesothelae: Liphistiidae)

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Abstract: A new species belonging to the genus *Songthela* Ono, 2000 is described from both the male and the female: *S. pluma* sp. nov. This species is currently known to occur only in Guiyang City, Guizhou Province, China. Detailed morphological characters, a distribution map, and illustrations of the habitus and copulatory organs are given.

Key words: Primitively segmented spiders, taxonomy, new species

The genus *Songthela* was established by Ono (2000) and refined by Xu et al. (2015). It belongs to the primitively segmented spider family Liphistiidae, exclusively distributed in eastern and southeastern Asia (http://wsc.nmbe.ch). Consistent with the habits of most liphistiid spiders, *Songthela* are ground-dwelling spiders that build trapdoor burrows used for prey capture, shelter, and protection (Bristowe, 1976; Coddington and Levi, 1991; Haupt, 2003; Figures 1–6). It is difficult to collect *Songthela* species in the field because of their concealed behavior (Xu et al., 2015). Therefore, almost 70% of the known species have been described from a few specimens of a single sex.

Currently, a total of 11 *Songthela* species are known, among which 10 species were recorded from China (Li and Lin, 2016; http://wsc.nmbe.ch). However, after *S. ciliensis* (Yin, Tang & Xu, 2003) and *S. mangshan* (Bao, Yin & Xu, 2003) were described from Hunan Province, no new species of this genus were reported from China (http://wsc.nmbe.ch). There should be no doubt that the diversity of this genus in China is still insufficiently known.

Recently, various collections of Guizhou Education University were carried out. During these field explorations, a liphistiid species was found. After a careful examination, this species was found to possess certain characters associated with the genus *Songthela*, but it can be easily distinguished from other species of this genus. Therefore, it is new to science and is described under the name of *Songthela pluma* sp. nov.

Spiders in this study were mainly collected by pitfall trapping and hand collection. All specimens were preserved in 75% ethanol. Type specimens are deposited in the Museum of Guizhou Education University, Guiyang, China (MGEU, curator: Hao Yu). Specimens were examined with an Olympus SZX7 stereomicroscope and an Olympus CX41 compound microscope. Male and female genitalia were examined and illustrated after dissection. Epigynes were removed and cleared in warm lactic acid before illustration. The vulva was also imaged after being embedded in Arabic gum. Photos were made with a Canon EOS70D digital camera mounted on an Olympus CX41 compound microscope. The digital images were taken and assembled using the Helifocus 6.80 software package. All measurements are in millimeters. Eye diameters were taken at the widest point. The total body length does not include the length of the chelicerae or spinnerets. Leg lengths are given as total length (femur, patella, tibia, metatarsus, tarsus).

Abbreviations used in the text and figures are as follows: ALE = Anterior lateral eyes; AME = anterior median eyes; BC = bursa copulatrix; BL = body length; CL = carapace length; Co = conductor; CT = contrategulum; CT-PT = the proximal teeth of the contrategulum; CT-DT = the distal teeth of the contrategulum; CW = carapace width; E = embolus; OL = opisthosoma length; OW = opisthosoma width; PC = paracymbium; PLE = posterior lateral eyes; PME = posterior median eyes; R = receptacle; RC = receptacular cluster; RS = receptacular stalk; T =

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Figures 1–6. Macrohabitat, retreats, and female habitus of Songthela pluma sp. nov., female paratype (MGEU-LJP-18-01). 1- Macrohabitat of Songthela pluma sp. nov. at the type locality; 2- Trap door, 18 mm wide; 3- Opening part of the retreat; 4- Globular room at the bottom of tubular retreat; 5- Habitus, dorsal ventral view; 6- Habitus, ventral view.
tegulum; TA-DDM = distally directed marginal apophysis of tegulum; TA-PDT = proximally directed terminal apophysis; TB = tegular base. Most of the terminologies used in the text and figure legends follow Xu et al. (2017).

**Songthela pluma sp. nov.** (Figures 1–23)

**Type material.** Holotype male (MGEU-LIP-17-01), China: Guizhou Province, Guiyang City, Wudang District, Guizhou Education University (26°38′53.138″N, 106°45′03.676″E).

**Figures 7–13.** *Songthela pluma sp. nov.*, male holotype (MGEU-LIP-17-01) (7–8, 11–13) and female paratype (MGEU-LIP-18-01) (9–10). 7- Habitus, dorsal view; 8- Habitus, ventral view; 9- Habitus, dorsal view; 10- Habitus, ventral view; 11- Left male palp, prolateral view; 12- Left male palp, ventral view; 13- Left male palp, retrolateral view. Scale bar = 5 mm (equal for 7–8, equal for 9–10); 0.5 mm (equal for 11–13).
Figures 17–22. *Songthela pluma* sp. nov., female paratype (MGEU-LIP-18-01). **17**- Epigyne, uncleared, ventral view; **18**- Epigyne, cleared, ventral view; **19**- Vulva, cleared and deposited in ethanol, dorsal view; **20**- Vulva, cleared and deposited in lactic acid, dorsal view; **21**- Vulva, cleared and deposited in ethanol, anterior view; **22**- Vulva, cleared and embedded in Arabic gum, dorsal view. Scale bar = 0.5 mm (equal for 17–22).
The species epithet is taken from the Latin word "pluma" and refers to the feathered conductor.

**Diagnosis.** Male distinguished from all other Songthela spp., except *S. hangzhouensis* (Chen, Zhang & Zhu, 1981) and *S. goulouensis* (Yin, 2001), by the conductor with two apical spines, by the contrategulum with serrated margin, and by the embolus with a flat opening, but differs from the latter two by the unsmoothed conductor with numerous scale-like teeth (Figures 11, 12, 14, and 16), the distinctly large teeth situated on the basal contrategulum (Figures 11, 12, 14, and 16), and the relatively long paracymbium (Figures 11–13). The female appears to be closely related to *S. sapana* (Ono, 2010) (Ono, 2010: 3, f. 11–16) in having similar receptacle and long receptacular stems, but differs by having eight eyes, instead of only six eyes in *S. sapana*.

**Description.** Male (holotype, MGEU-LIP-17-01) (Figures 7 and 8). Carapace brown in alcohol, oval; cervical groove and radial groove distinct, integument smooth and hairless. Opisthosoma light brown and ball-shaped, with ten tergites, close to each other, the third largest; seven spinnerets. Sternum narrow, much longer than wide. Chelicerae robust with promargin of cheliceral groove containing 12 denticles of variable size; legs with strong hairs and spines. Measurements: BL 13.19, CL 5.18, CW 4.52, OL 7.19, OW 5.58; ALE > PLE > PME > AME; leg I 16.75 (4.75 + 1.99 + 3.55 + 4.13 + 2.33), leg II 16.98 (4.62 + 1.92 + 3.49 + 4.47 + 2.48), leg III 18.57 (5.00 + 1.67 + 3.65 + 5.28 + 2.96), leg IV 23.16 (5.77 + 2.23 + 4.69 + 7.65 + 2.82).

**Palp** (Figures 11–16): Paracymbium relatively long and for about four-fifths the length of cymbium, its prolateral side unpigmented and unsclerotized, many setae situated at the tip of paracymbium (Figures 11–13). Contrategulum with a double row of dentate edges, the proximal teeth large and sparse, the distal teeth small and dense (Figures 11, 12, 14, and 16). Tegulum with a wide base and two tegular apophyses, tegular base flat and with a serrated margin, distally directed marginal apophysis with a rugate edge and a fingerlike hump, proximally directed terminal apophysis petal-shaped (Figures 15 and 16). Conductor with a relatively narrow proximal portion and two apical spines (the longer one nearly reaching the embolus edge, the shorter one positioned at the middle part of conductor), its middle portion unsmoothed and with numerous scale-like teeth (Figures 11, 12, 14, and 16). Embolus largely sclerotized, fused with conductor at the basal portion, distal free and with a wide, flat opening (Figures 11–16).
Female (one of the paratypes, MGEU-LIP-18-01). General characters as in male, but slightly larger in size and darker in color (Figures 5, 6, 9, and 10). Measurements: BL 11.53, CL 5.26, CW 3.61, OL 5.54, OW 3.94; PLE > ALE > PME > AME; leg I 8.97 (2.56 + 1.70 + 1.88 + 1.82 + 1.01), leg II 8.85 (2.27 + 1.79 + 1.92 + 1.84 + 1.04), leg III 9.06 (2.35 + 1.87 + 1.95 + 1.07), leg IV 14.48 (3.65 + 2.18 + 2.98 + 3.91 + 1.76).

Epigyne-vulva (Figures 17–22). Epigynal field unremarkable with several spines, posterior margin recessed slowly (Figures 17 and 18); two pairs of receptacular clusters present, each consisting of a tubular stalk and an ovoid receptacle; the middle receptacular clusters with relatively long stalks, extending over the anterior margin of bursa copulatrix; the lateral pair with relatively short stalks, located on the dorsal wall of the bursa copulatrix; the middle pair slightly larger than the lateral pair; the four stalks fused together at base (Figures 19–22).

Distribution. This species is known only from the type locality (Figure 23).

Nomenclatural acts: This work and the nomenclatural acts it contains have been registered in ZooBank. The ZooBank Life Science Identifier (LSID) for this publication is http://zoobank.org/urn:lsid:zoobank.org:pub:29C0504E-AA64-49D2-B817-0838C380C61A.

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