



## Monograph

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# Overview of the Anyphaenids (Araneae, Anyphaeninae, Anyphaenidae) spider fauna from the Chocó forest of Ecuador, with the description of thirteen new species

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**Abstract.** The spider diversity of the family Anyphaenidae in premontane, low evergreen montane and cloud forest from the Chocó region of Ecuador is examined. A total of 287 adult specimens were collected and 19 morphospecies were identified based on male specimens. Thirteen new species are described and one new genus is proposed. Five new species are described in the genus *Katissa* Brescovit, 1997: *Katissa kurusiki* sp. nov., *K. puyu* sp. nov., *K. tamya* sp. nov., *K. yaya* sp. nov. and *K. guyasamini* sp. nov. The new genus *Shuyushka* gen. nov. is proposed and includes three species: *Shuyushka achachay* gen. et sp. nov., *S. moscai* gen. et sp. nov. and *S. wachi* gen. et sp. nov. Finally, five species are described in the genus *Patrera* Simon, 1903: *P. hatunkiru* sp. nov., *P. philipi* sp. nov., *P. suni* sp. nov., *P. shida* sp. nov. and *P. witsu* sp. nov. New records are provided for *Patrera fulvastra* Simon, 1903 and *Josa nigrifrons* Simon, 1897.

**Keywords.** New genera, *Katissa*, cloud forest, biodiversity, caterpillar-like abdomen.

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## Introduction

The Tumbes-Chocó-Magdalena corridor runs from Panama to the northwestern corner of South America. Considered a biodiversity hotspot, from this unique region a high number of species has been recorded: 11 000 plant species, 895 birds, 285 mammals, 327 reptiles, 203 amphibians and 251 freshwater fishes, of which 3114 species are endemic to the region (Conservation International 2013). In 2014, the project ‘Spider diversity in the Chocó forests of Ecuador’ was launched as part of the National Geographic Society/Waite grant program. The project set out to study the spider biodiversity of the premontane,

low evergreen and cloud forest of this unique corridor. The first results were presented in 2015 with the publication and description of 13 new species in the new genus *Chococtenus* Dupérré, 2015 from the family Ctenidae (Dupérré 2015a), the discovery of the first Telemidae from South America (Dupérré & Tapia 2015) and the first record and a new species of Paratropididae (Dupérré 2015b). Herein, we present further results of this study pertaining to the Anyphaenidae family.

The family Anyphaenidae includes 542 species in 56 genera (World Spider Catalog 2016). They occur worldwide but are very diverse in tropical regions (Jocqué & Dippenaar-Schoeman 2006), especially in South America where 29 endemic genera belonging to the subfamily Amaurobioidinae are found (Ramírez 2003). In Ecuador, 24 species are known to occur, mostly described by Berland (1913) and mainly from the subfamily Anyphaeninae (Dupérré 2014). Anyphaenids are small to medium size spiders (2.5–17.0 mm), ecribellate, entelegyne and with two superior claws. They are easily distinguished by their spatulate claw tuft setae and the position of the tracheal spiracle, which is situated one third of the abdomen length from the spinnerets (Richman & Ubick 2005; Jocqué & Dippenaar-Schoeman 2006; Ramírez 2014). Anyphaenids are active at night, occurring in foliage of trees and leaf litter, and due to their rapid movements and their pale legs, they are known as ghost-spiders (Brescovit 1997; Labarque *et al.* 2015). Some species are also known to live in the intertidal zone (Ramírez 2003; Jocqué & Dippenaar-Schoeman 2006), but most species are arboreal and can be found in a wide range of habitats, such as forests, deserts, semi-arid crops (Brescovit 1997) and grasslands, where they can be quite abundant (Labarque *et al.* 2015).

Ramírez (1995a) presented a phylogenetic analysis of the family Anyphaenidae and proposed three subfamilies: Malenellinae (1 genus) found only in Chile, Anyphaeninae (33 genera) mostly from the New World with representatives in the Palearctic, the Oriental regions and Polynesia, and, finally, Amaurobioidinae (22 genera) found mainly in South America, except for the genus *Josa* Keyserling, 1891, found in Central America, the genus *Arachosia* O. Pickard-Cambridge, 1882 from Central and North America, and the genus *Amaurobioides* O. Pickard-Cambridge, 1883, which is found in Chile, South Africa, Australia, Tasmania and New Zealand (Ramírez 2003). More recently, Ramírez (2014) in his morphological and phylogenetic analysis of dionychan spiders, reinstated the subfamilies Anyphaeninae and Amaurobioidinae, but the subfamily Malenellinae was not maintained. To this day, no phylogenetic analysis of the subfamily Anyphaeninae has been presented. However, Ramírez (2003) showed that the subfamily Anyphaeninae is paraphyletic and that the subfamily Amaurobioidinae is monophyletic. Labarque *et al.* (2015) corroborated these findings and showed for the first time that the genus *Josa* is the basal group, sister to all the other members of the subfamily Amaurobioidinae.

The subfamily Anyphaeninae has mainly been studied by Brescovit (1991a,b, 1992a,b,c, 1993a,b, 1997, 1999; Oliveira & Brescovit 2015). In 1997, he reviewed the entire subfamily from the Neotropical region, redescribed all known genera, created 14 new genera and provided a complete and detailed overview of the morphology. The subfamily Amaurobioidinae was intensively studied by Ramírez (1993, 1995b, 1997, 1999, 2003, 2007) and Ramírez *et al.* (2004) and others (Lopardo 2005; Werenkraut & Ramírez 2009; González Márquez & Ramírez 2012; Izquierdo & Ramírez 2008; Soto & Ramírez 2012; Laborda *et al.* 2013; Labarque *et al.* 2015; Rubio & Ramírez 2015).

The aim of this work is to propose a new genus, describe 13 new species of Anyphaenidae and present ecological data for all Anyphaenid spiders found in premontane, low evergreen montane and cloud forests of the Chocó region of Ecuador.

## **Material and methods**

The main collecting site was situated in the Otonga Biological Reserve, 4.5 km northeast of San Francisco de la Pampas. The reserve covers more than 1500 hectares and 80% is covered by primary

forest. The reserve is characterised by its irregular terrain with steep slopes, deep valleys and small streams. The annual humidity ranges between 80–90%, with 2000–2500 mm of precipitation annually, and an average temperature of 16°C (Jarrín 2001). Otonga is dominated by three types of habitats: premontane evergreen forest (bosque siempreverde piemontano) with an altitudinal range from 800 m to 1300 m (Cerón *et al.* 1999), low evergreen montane forest (bosque siempreverde montano bajo) between 1300 m and 1800 m and cloud forest (bosque de neblina montano) between 1800 m and 3000 m (Valencia *et al.* 1999).

Four collecting trips were made; one week sampling in the rainy season (24–30 May 2014), one week sampling at the end of the rainy season (1–7 Jul. 2014), one week sampling at the middle of the dry season (7–13 Sep. 2014), and one week sampling at the beginning of the rainy season (3–8 Nov. 2014). Six collecting techniques were used; pitfall traps, beating, sweeping, microhabitat collecting and litter sifting with Berlese funnel extraction and hand collecting, day and night. Five pitfall lines of ten pitfalls each, were installed on the south side of the mountain: pitfall line 1 (00.4195° S, 78.9961° W) at 1717 m, pitfall line 2 (00.4143° S, 79.0004° W) at 1888 m, pitfall line 3 (00.4199° S, 79.0062° W) at 1997 m, pitfall line 4 (00.4156° S, 79.0043° W) at 2105 m and pitfall line 5 (00.4226° S, 79.511° W) at 2225 m. Five pitfalls lines of ten pitfalls were also installed on the north side of the mountain, Las Damas (00.3951° S, 78.9810° W) at 1209 m. The Las Damas site was selected because it represents the lowest point of the reserve with remaining primary forest. The pitfalls ran from May until September 2014, and were emptied every 10–12 days.

All specimens from this study were collected at the same locality. Matching males and females can be tricky, consequently males and females were matched on the base of several criteria: 1) whether they were collected together, 2) on size and colour, and 3) on abundance. When in doubt, females were not matched, for that reason some species are only described from males until more material becomes available.

Of the 19 morphospecies collected, four morphospecies are based on male specimens (Unknown 1 (also ♀), 2, 3, 9) and remain unidentified to genus or species level. Five more possible morphospecies were also collected but only represented by female specimens (Unknown 4, 5, 6, 7, 8). In order not to inflate the morphospecies count they are not included in the total number of morphospecies collected, but their ecological and collection data are provided.

Material examined is deposited in the following institutions:

AMNH = American Museum of Natural History New York, NY, U.S.A.

DTC = Dupérré-Tapia Collection, Quito, Ecuador

QCAZ = Museum of Invertebrates, Pontificia Universidad Católica, Quito, Ecuador

Specimens were examined in 70% ethanol under a SMZ-U Nikon dissection microscope. A Nikon Coolpix 950 digital camera attached to the microscope was used to photograph all the structures to be illustrated. The digital photos were used to trace proportions and the illustrations were detailed and shaded by referring back to the structure under the microscope. Female genitalia were excised using a sharp entomological needle placed on a slide in lactic acid and observed under an AmScope XSG Series T-500 compound microscope. All measurements are in millimetres and were made taken using a micrometric ruler fitted on the eyepiece of the microscope. Morphological nomenclature follows Brescovit (1997).

### Abbreviations

Somatic morphology:

ALE = anterior lateral eyes

AME = anterior median eyes  
cap = cheliceral anterior projection  
LE = lateral eyes  
PLE = posterior lateral eyes  
PME = posterior median eyes

Genitalia (♀):

a = atrium  
cd = copulatory ducts  
co = copulatory openings  
ef = epigynal flap (aba in Brescovit 1997: 11)  
fd = fertilization ducts  
k = knob-like projection  
leg = lateral epigynal grooves (bordas laterais in Brescovit 1997: 11)  
s = spermathecae  
sr = seminal receptacles

Genitalia (♂):

cap = cheliceral anterior projection  
da = dorsal apophysis  
dps = distal projection of subtegulum (PST in Brescovit 1997: 7)  
ds = dorsal spur  
e = embolus  
eb = embolic base  
ma = median apophysis  
rta = retrolateral tibial apophysis  
sbt = subtegulum  
sk = subtegular keel  
t = tegulum  
vpa = ventral patellar apophysis  
vta = ventral tibial apophysis  
vtp = ventral tegular projection (PTV in Brescovit 1997: 10)

## Results

A total of 287 adult specimens (142 males, 145 females) of Anyphaenidae were collected. The two most abundant species collected were *Patrera fulvastra* Simon, 1903 and *Patrera philipi* sp. nov., which accounted for 25% of the total Anyphaenid fauna collected. Most Anyphaenids specimens (90%) were collected from moss extraction, beating trees and night collecting.

## Taxonomy

Class Arachnida Cuvier, 1812  
Order Araneae Clerck, 1757  
Family Anyphaenidae Bertkau, 1878

Subfamily **Anyphaeninae** Bertkau, 1878

## Diagnosis

Tracheal spiracle situated approximately in midway of abdomen or between the midway of abdomen and the epigastric groove; cheliceral retromargin with more than four denticles (Brescovit 1997: 7).

Genus *Katissa* Brescovit, 1997

**Type species**

*Anyphaena simplicipalpis* Simon, 1897.

**Composition**

*Katissa delicatula* (Banks, 1909), *K. elegans* (Banks, 1909), *K. guayasamini* sp. nov., *K. kurusiki* sp. nov., *K. lycosoides* (Chickering, 1937), *K. puyu* sp. nov., *K. simplicipalpis* (Simon, 1897), *K. tamyra* sp. nov., *K. yaya* sp. nov., *K. zimarae* (Reimoser, 1939).

**Diagnosis** (Adapted from Brescovit 1997: 53)

Carapace sub-rectangular (Fig. 1); posterior eye row procurved (Fig. 1); male palpal cybium narrow, elongated; embolic base wide, prolaterally protruding (Fig. 2); females epigynum with epigynal flap hiding the copulatory openings (Fig. 5); lateral epigynal grooves sinuous, basally positioned (Fig. 5). Furthermore, *Katissa* is distinguished from *Isigonia* Simon, 1897, by its rather flat carapace, convex in the latter (Brescovit 1997: fig. 113).

**Description**

For a complete description, see Brescovit (1997: 53), only new information is presented here.

LEGS. Leg formula 1423 in males and 4123 in females (except for females of *K. kurusiki* sp. nov. and *K. guayasamini* sp. nov.).

LEGS SPINATION RECURRENCE. Femora I–IV d1-1-1; metatarsi III–IV p1-1-1, r1-1-1.

MALE GENITALIA. Retrolateral palpal tibial apophysis variable, distally rounded (Fig. 3), plate-like (Fig. 8), bipartite (Fig. 13) or elongated ventrally with a small basal spur dorsally (Figs 18, 23). Palpal tibia variable, shorter (Figs 3, 8, 18, 23) or longer than cymbium (Fig. 13). Male embolic base large, protruding prolaterally (Fig. 2); embolus ribbon-like with distal part usually pale, weakly sclerotized (Figs 2, 12, 17).

FEMALE GENITALIA. Epigynum slightly sclerotized; medially with an epigynal flap of various shape, either wing-shaped (Figs 5, 15), V-shaped (Figs 10, 25) to knob-shaped (Fig. 20); lateral epigynal grooves sinuous, positioned posteriorly (Figs 5, 10, 15, 20, 25); copulatory openings situated under the epigynal flap, not visible. Internal genitalia with oval (Figs 6, 16, 21) to bean-shaped (Fig. 26) spermathecae; copulatory ducts long and convoluted (Figs 6, 21) to short and sinuous (Figs 11, 16, 26); seminal receptacles positioned at the beginning of copulatory ducts (Figs 6, 21, 26).

**Notes**

The length of the embolus appears to be correlated to the length of the copulatory ducts of the female internal genitalia. For example, the longest embolus (Figs 2, 17) found in *Katissa kurusiki* sp. nov. and *Katissa tamyra* sp. nov., correspond to the females with the longest copulatory ducts (Figs 6, 21). On the other end, the male of *Katissa yaya* sp. nov. has a short embolus (Fig. 12) matching the females with short copulatory ducts (Fig. 16). The epigynum in *Katissa* species are slightly sclerotized and bear curved lateral epigynal grooves that could serve to direct the embolus in the copulatory openings situated under the epigynal flap, which is somewhat more sclerotized. The internal genitalia of *Katissa kurusiki* sp. nov., *K. tamyra* sp. nov. and *K. guayasamini* sp. nov. all have seminal receptacles situated at the beginning of the copulatory ducts (Figs 6, 21, 26).

## Distribution

Costa Rica, Panama, Lesser Antilles, Ecuador and Peru.

*Katissa kurusiki* sp. nov.

[urn:lsid:zoobank.org:act:1997B8DA-325A-42F4-B1F5-AF30568A11D2](https://doi.org/10.1111/zoobank.org/act:1997B8DA-325A-42F4-B1F5-AF30568A11D2)

Figs 1–6

## Diagnosis

Males are easily distinguished from all other congeneric species by the elongated, sinuous projection of the abdomen, resembling a caterpillar (Fig. 1). Females are distinguished by their wing-shaped epigynal flap (Fig. 5) and convoluted copulatory ducts, with three loops (Fig. 6).

## Etymology

The specific name is a noun in apposition taken from the Kichwa language, the combination of the words ‘kuru’ and ‘siki’ meaning worm-bottom.

## Type material examined

### Holotype

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, sifting moss, 8–21 Jun. 2014, 1717 m, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).

### Other material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 2 ♀♀, sifting moss, 00.41941° S, 78.99607° W, 1717 m, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, sifting moss near Rio Esmeraldas, 24 May–8 Jun. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 4 ♀♀, sifting moss, 8–21 Jun. 2014, 1717 m, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 2 ♂♂, 3 ♀♀, sifting moss, 2225 m, E. Tapia, C. Tapia and N. Dupérré leg. (AMNH); 1 ♀, sifting litter, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, sifting moss, -00.42261° S, -79.5107° W, 2225 m, 21 Jun. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

## Description

### Male (holotype)

MEASUREMENTS. Total length: 5.6; carapace length: 2.1 carapace width: 1.6.

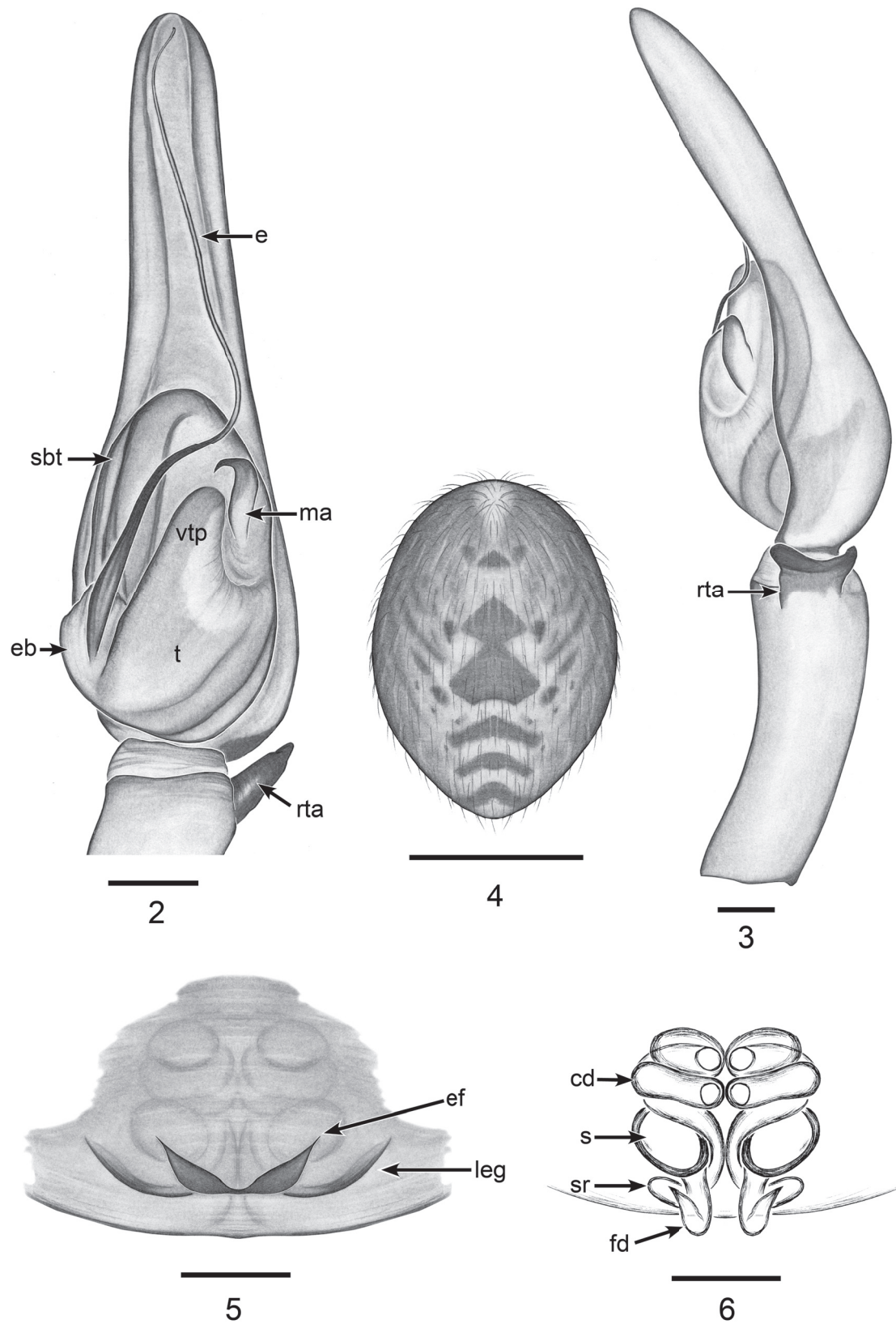
CEPHALOTHORAX. Pars cephalica dark brown with black mesh pattern; pars thoracica with wide dark bands dorsally, apically and laterally light brown; margin dark brown (Fig. 1). Sternum, endites and labium light brown.

CHELICERAE. Brown, excavated with antero-prolateral keel; promargin with 3, retromargin with 5 teeth.

LEGS. Femora I, II light yellow with light brown band apically and dark spots at macrosetae base; femora III, IV light brown with medial and apical dark bands and dark spots at base of macrosetae. Tibiae I, II light yellow with dark bands basally and medially; tibiae II–IV light yellow with dark bands basally and apically. Metatarsi I, II brown; metatarsi III, IV yellow with dark apical band. Tarsi I–IV brown. Claws unipectinate, I, II with 6–7 teeth and III–IV with 4–5 teeth. Total length: I: 9.7; II: 7.7; III: 5.8; IV: 7.8; leg formula 1423; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 2.5/0.8/2.7/2.6/1.1; leg II 2.0/0.7/1.9/2.2/0.9; leg III 1.6/0.6/1.3/1.7/0.6; leg IV 2.1/0.7/1.8/2.4/0.8.



**Fig. 1.** *Katissa kurusiki* sp. nov. ♂, habitus, dorsal view. Scale bar: 1 mm.



**Figs 2–6.** *Katissa kurusiki* sp. nov. **2.** ♂, palp, ventral view. **3.** ♂, palp, retrolateral view. **4.** ♀, abdomen, dorsal view. **5.** ♀, epigynum, ventral view. **6.** ♀, internal genitalia, dorsal view. Scale bars: 2–3, 5–6 = 0.1 mm; 4 = 1 mm.



LEGS SPINATION. Femur I p1-1-1, r1-1-1; tibia I v2-1-2, p0-1-1, r1-1-1; metatarsus I v2-2-0, p0-1-0, r1-1-1. Femur II p1-1-1, r1-1-1; tibia II v2-2-0, p0-1-1, r0-1-1; metatarsus II v2-2-0, p0-1-0, r1-1-1. Femur III p0-1-1, r0-1-1; tibia III d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus III d0-1-1, v2-2-1. Femur IV p0-1-1, r0-0-1; tibia IV d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus IV d0-1-0, v2-2-0.

ABDOMEN. Elongated oval with whitish caterpillar-like extension of various size (Fig. 1). Dorsally light brown, with dark brown pattern composed of spots and two large pyramidal medial dark marks (Fig. 1). Covered with long, dark erected setae and short, none erected light coloured setae. Ventrally, light brown. Spinnerets positioned at the junction between the oval abdomen and the caterpillar-like extension.

GENITALIA. Palpal tibia shorter than cymbium; retrolateral tibial apophysis wide and curved with rounded tips (Fig. 3). Subtegulum rounded apically without keel; tegulum rounded basally; ventral tegular process rounded apically not reaching median apophysis tip; median apophysis elongated, hook-shaped; embolic base protruding prolaterally; embolus ribbon-like, long with distal pale portion (Fig. 2).

### **Female**

MEASUREMENTS. Total length: 4.2; carapace length: 1.7; carapace width: 1.3.

CEPHALOTHORAX. As in male.

CHELICERAE. Brown, not excavated without keel; cheliceral teeth as in male.

LEGS. Colouration as in male. Claws as in male. Palpal claws with 5 teeth. Total length: I: 6.3; II: 5.1; III: 4.1; IV: 5.6; leg formula 1423; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 1.6/0.6/1.5/1.4/1.2; leg II 1.4/0.6/1.3/1.1/0.7; leg III 1.2/0.5/0.8/1.1/0.5; leg IV 1.6/0.6/1.3/1.4/0.7.

LEGS SPINATION. Femur I p0-1-1; tibia I v2-2-0, p0-0-1; metatarsus I v2-2-0, p0-1-0. Femur II p0-1-1; tibia II v2-2-0, p0-1-1, r0-1-0; metatarsus II v2-2-0, p0-1-0. Femur III p0-0-1, r0-1-1; tibia III d0-1-0, v1-2-2, p0-1-1, r0-1-1; metatarsus III d0-1-0, v2-2-1. Femur IV p0-0-1, r0-0-1; tibia IV d0-0-1, v1-2-2, p0-1-1, r0-1-1; metatarsus IV d0-1-0, v2-2-1.

ABDOMEN. Oval. Dorsally brownish, with pattern composed of dark pyramidal marks medially and chevrons basally (Fig. 4). Covered with long, dark erected setae and short, none erected light coloured setae.

GENITALIA. Epigynum with wing-shaped epigynal flap; lateral epigynal grooves curved (Fig. 5). Internal genitalia; copulatory ducts elongated with three loops; seminal receptacles positioned at the beginning of copulatory ducts course; spermathecae oval; fertilization ducts short (Fig. 6).

### **Natural history**

Except for one female, all specimens were collected by sifting moss hanging from trees.

### **Distribution**

Ecuador: known only from the type locality.

*Katissa puyu* sp. nov.

[urn:lsid:zoobank.org:act:13A72BC0-3929-440D-97D2-083D2BFA9D95](https://doi.org/10.21203/rs.3.rs-1314723/v1)

Figs 7–11

**Diagnosis**

Males can be distinguished from all congeneric species by the apically serrated plate-like palpal retrolateral tibial apophysis (Fig. 8); from *K. simplicipalpis* (Simon, 1897), by the white nub at the end of the abdomen, absent in the latter species (Brescovit 1997: fig. 99). Females are distinguished by the small V-shaped epigynal flap (Fig. 10), from *K. simplicipalpis* (Simon, 1897) by the elongated copulatory ducts, short and coiled in the latter species (Brescovit 1997: fig. 103).

**Etymology**

The specific name is a noun in apposition taken from the Kichwa language meaning ‘fog’.

**Type material examined**

**Holotype**

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, 21 Jun. 2014, sifting moss, foothill, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).

**Other material examined**

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 4 ♂♂, 2 ♀♀, sifting moss, -00.42261° S, -79.5107° W, 2225 m, 21 Jun. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 2 ♂♂, 1 ♀, moss from trees at 0.5–3 m, 1888 m, 15 Oct. 2014, -00.41433° S, -79.00035° W, Berlese, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, moss, 13–15 Nov. 2014, Berlese, E. Tapia, C. Tapia and N. Dupérré leg. (AMNH).

**Description**

**Male (holotype)**

MEASUREMENTS. Total length: 2.6; carapace length: 1.3 carapace width: 0.9.

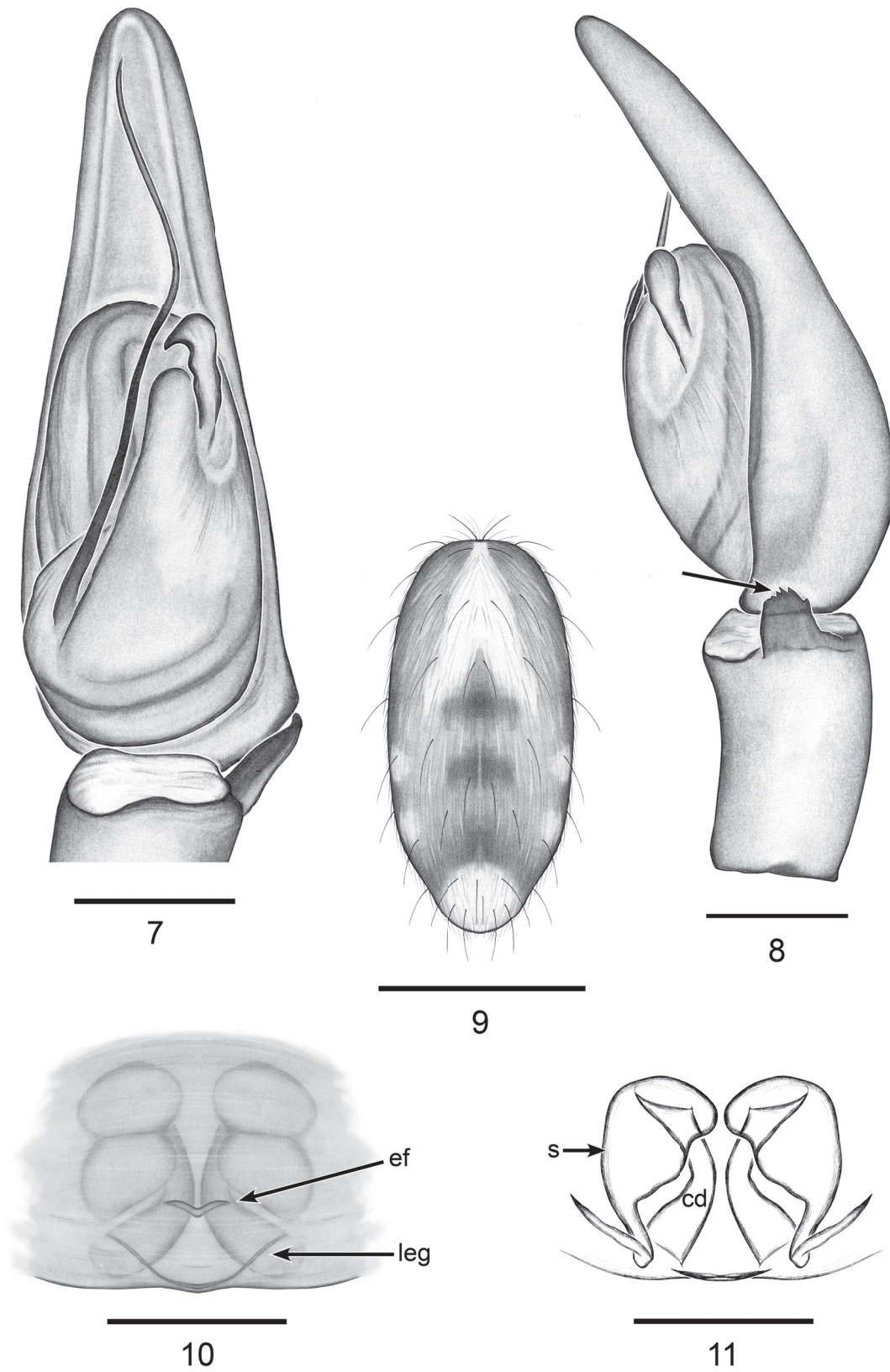
CEPHALOTHORAX. Pars cephalica and pars thoracica brown, with two dark dorsal, wide bands; margin dark brown. Sternum, endites and labium light brown.

CHELICERAE. Brown, not excavated without antero-prolateral keel; promargin with 3, retromargin with 4 teeth.

LEGS. Femora I–IV light yellow with dark band apically. Tibiae yellowish with dark band basally. Metatarsi and tarsi yellowish. Claws unipectinate, I–II with 6 teeth and II–IV with 4 teeth. Total length: I: 3.9; II: 3.4; III: 2.7; IV: 3.8; leg formula 1423; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 1.0/0.4/1.0/0.9/0.6; leg II 0.9/0.4/0.8/0.8/0.5; leg III 0.7/0.4/0.6/0.7/0.3; leg IV 1.0/0.4/0.9/1.0/0.5.

LEGS SPINATION. Femur I p1-1-1, r0-1-1; tibia I v2-2-2, p1-1-0, r1-1-0; metatarsus I v2-2-0, p1-1-0, r0-1-0. Femur II p1-1-1, r0-1-1; tibia II v2-2-0, p1-1-0, r1-1-0; metatarsus II v2-2-0, p1-1-0, r1-0-1. Femur III p0-1-1-, r0-1-1; tibia III d1-0-0, v2-2-2, p1-1-0, r1-1-0; metatarsus III d0-1-0, v2-2-0. Femur IV p0-1-1, r0-0-1; tibia IV d1-0-0, v2-2-2, p1-1-1, r1-1-0; metatarsus IV d0-1-0, v2-2-0.

ABDOMEN. Elongated, slightly constricted apically. Light brown, with whitish medio-apical mark, and dark brown pattern composed of dark medial marks, apex rounded and whitish. Covered with long, dark erected setae and short, none erected light coloured setae (Fig. 9).



**Figs 7–11.** *Katissa puyu* sp. nov. 7. ♂, palp, ventral view. 8. ♂, palp, retrolateral view (arrow points to the serrated retrolateral tibial apophysis). 9. ♂, abdomen, dorsal view. 10. ♀, epigynum, ventral view. 11. ♀, internal genitalia, dorsal view. Scale bars: 7–8, 10–11 = 0.1 mm; 11 = 0.5 mm.

GENITALIA. Palpal tibia shorter than cymbium, with plate-like, serrated retrolateral tibial apophysis (Fig. 8). Subtegulum rounded apically; tegulum rounded basally; ventral tegular process rounded apically not reaching median apophysis tip; median apophysis elongated, hook-shaped; embolic base protruding prolaterally; embolus ribbon-like, short with distal pale portion (Fig. 7).

### Female

MEASUREMENTS. Total length: 3.2; carapace length: 1.3; carapace width: 0.9.

CEPHALOTHORAX. As in male. Sternum, endites and labium as in male.

CHELICERAE. Brown, not excavated without keel; promargin with 3, retromargin with 4 teeth.

LEGS. As in male. Claws as in male. Palpal claws with 5 teeth. Total length: I: 3.6; II: 3.1; III: 2.6; IV: 3.8; leg formula 4123; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 1.0/0.4/0.9/0.7/0.6; leg II 0.8/0.4/0.7/0.7/0.5; leg III 0.7/0.3/0.5/0.7/0.4; leg IV 1.0/0.4/0.8/1.1/0.5.

LEGS SPINATION. Femur I p0-0-1; tibia I v2-2-2; metatarsus I v2-2-0. Femur II p0-0-1; tibia II v2-2-0, p0-0-1; metatarsus II v2-2-0, p0-1-0. Femur III p0-0-1-, r0-0-1; tibia III d1-0-0, v1-1-2, p1-1-0, r1-1-0; metatarsus III d0-1-0, v2-2-0. Femur IV r0-0-1; tibia IV d1-0-0, v1-1-2, p1-1-0, r1-1-0; metatarsus IV d0-1-0, v2-2-0.

ABDOMEN. Oval. Brown, with withish medio-apical mark, and dark brown pattern composed of medial dark marks. Covered with long, dark erected setae and short, none erected light coloured setae.

GENITALIA. Epigynum with V-shaped epigynal flap; lateral epigynal grooves curved (Fig. 10). Internal genitalia; copulatory ducts short; seminal receptacles not observed; spermathecae elongated oval; fertilization ducts long (Fig. 11).

### Natural history

All specimens were collected in the moss hanging from trees.

### Distribution

Ecuador: known only from the type locality.

*Katissa tanya* sp. nov.

[urn:lsid:zoobank.org:act:BF03787D-B307-4C3C-A885-DFDD860A35C3](https://doi.org/10.3896/EB.2016.255.1.1)

Figs 12–16

### Diagnosis

Males can be distinguished from all congeneric species by their bipartite palpal retrolateral tibial apophysis (Fig. 13). Females are distinguished by their elongated wave-shaped epigynal flap (Fig. 15).

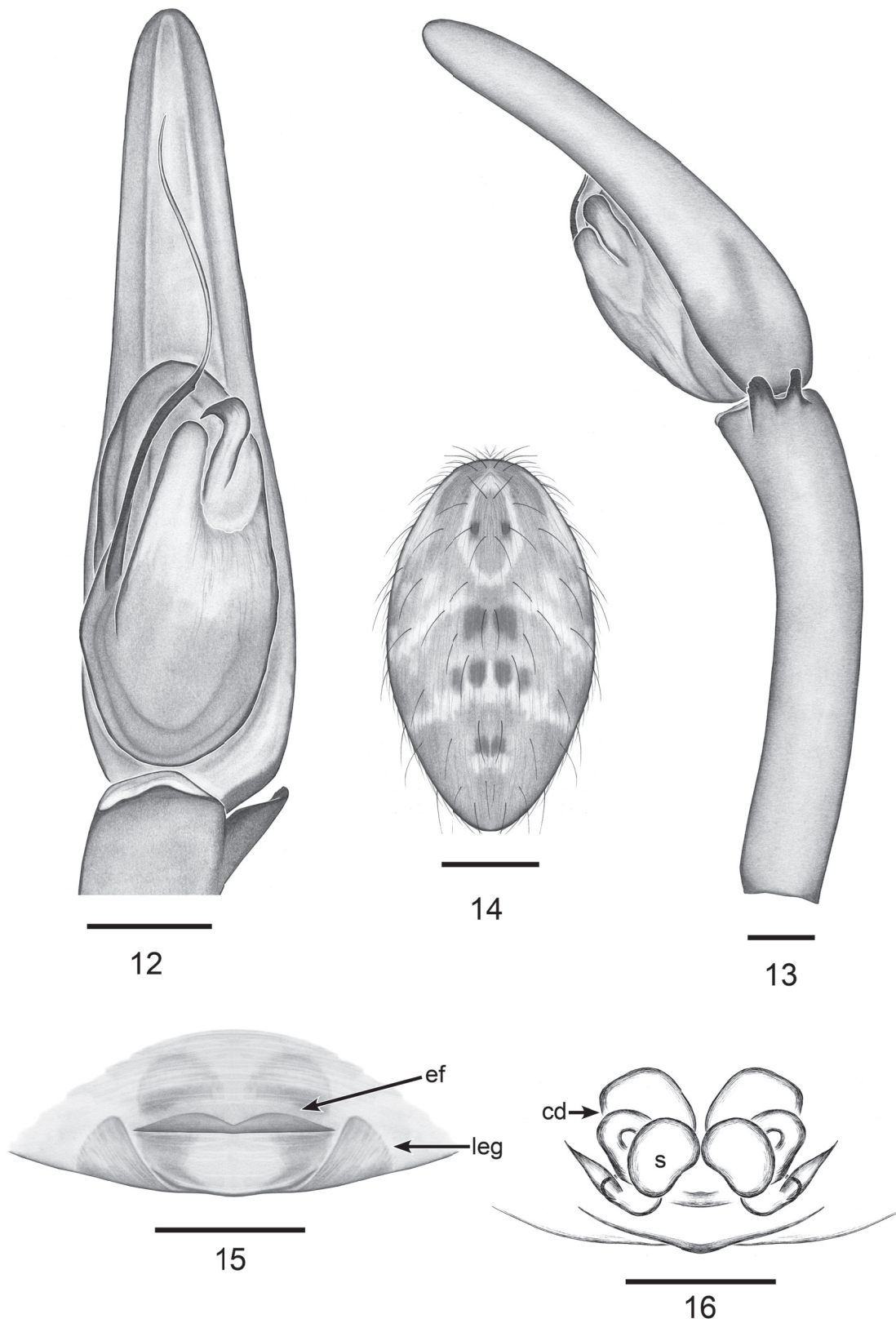
### Etymology

The specific name is a noun in apposition taken from the Kichwa language meaning rain.

### Type material

#### Holotype

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, 21 Jun. 2014, sifting moss, foothill, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).



**Figs 12–16.** *Katissa tamya* sp. nov. **12.** ♂, palp, ventral view. **13.** ♂, palp, retrolateral view. **14.** ♀, abdomen, dorsal view. **15.** ♀, epigynum, ventral view. **16.** ♀, internal genitalia, dorsal view. Scale bars: 12–13, 15–16 = 0.1 mm; 14 = 0.5 mm.

### Other material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♀, sifting moss, 00.42261° S, 79.5107° W, 2225 m, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ); 2 ♀♀, 00.41941° S, 78.99607° W, 1717 m, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 3 ♀♀, beating trees, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 2 ♂♂, 4 ♀♀, hand collecting in moss, 24 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 4 ♀♀, Berlese, moss, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 4 ♀♀, sifting moss, foothill, 21 Jun. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (AMNH); 1 ♀, moss from trees at 3m high, -00.41433° S, -79.00035° W, 1888 m, 15 Oct. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♀, sifting moss, 12 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 1 ♀, moss, 13–15 Nov. 2014, Berlese, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Description

#### Male (holotype)

MEASUREMENTS. Total length: 4.3; carapace length: 2.1 carapace width: 1.5.

CEPHALOTHORAX. Pars cephalica and pars thoracica yellow with two dark wide bands dorsally; margin dark brown. Sternum yellow with two dark lateral bands; endites and labium brown.

CHELICERAE. Brown, excavated with antero-prolateral keel; promargin with 3, retromargin with 5 teeth.

LEGS. Femora I–IV light yellow. Tibiae light yellow, with dark band basally. Metatarsi light yellow with dark band apically. Tarsi light yellow. Claws unipectinate, I–II with 6 teeth and II–IV with 4–5 teeth. Total length: I: 7.6; II: 6.7; III: 5.0; IV: 7.1; leg formula 1423; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 2.1/0.6/2.1/1.8/1.0; leg II 1.7/0.6/1.8/1.7/0.9; leg III 1.4/0.5/1.0/1.5/0.6; leg IV 2.0/0.6/1.5/2.2/0.8.

LEGS SPINATION. Femur I p1-1-1, r1-1-1; tibia I v2-2-2, p1-1-1, r1-1-1; metatarsus I v2-0-0, p1-1-1, r1-1-1. Femur II p1-1-1, r1-1-1; tibia II v2-2-2, p1-1-1, r1-1-1; metatarsus II v2-0-0, p1-1-1, r1-1-1. Femur III p0-1-1-, r0-1-1; tibia III d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus III d0-1-0, v2-2-1. Femur IV p0-0-1, r0-0-1; tibia IV d1-1-0, v2-2-2, p1-1-0, r1-1-1; metatarsus IV d0-1-0, v2-2-1.

ABDOMEN. Elongated oval. Light brown with pale median band with some small extending branches laterally, with a few darker, paired marks along median pale band.

GENITALIA. Palpal tibia longer than cymbium; retrolateral tibial apophysis bipartite (Fig. 13). Subtegulum rounded apically; tegulum rounded basally; ventral tegular process rounded apically reaching median apophysis tip; median apophysis elongated, hook-shaped; embolic base slightly protruding prolaterally; embolus ribbon-like, short, black with distal pale portion (Fig. 12).

#### Female

MEASUREMENTS. Total length: 3.9; carapace length: 1.8 carapace width: 1.3.

CEPHALOTHORAX. As in male.

CHELICERAE. Brown, not excavated without keel; promargin with 4, retromargin with 5 teeth.

LEGS. Femora I–II light yellow. Femora III–IV light yellow with brown spots dorsally. Tibiae light yellow with dark band basally and apically. Metatarsi light yellow with dark band apically. Tarsi light yellow. Claws as in male. Palpal claws with 4 teeth. Total length: I: 5.8; II: 5.4; III: 4.4; IV: 5.9; leg

formula 4123; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 1.6/0.7/1.4/1.3/0.8; leg II 1.5/0.6/1.4/1.2/0.7; leg III 1.3/0.5/0.9/1.2/0.5; leg IV 1.7/0.5/1.4/1.8/0.5.

LEGS SPINATION. Femur I p0-1-1; tibia I v2-2-0, p0-1-1, r0-1-0; metatarsus I v2-0-0, p1-0-0. Femur II p0-0-1; tibia II v2-2-0, p0-1-1, r0-1-0; metatarsus II v2-0-0, p1-0-0, r0-1-0. Femur III p0-0-1, r0-0-1; tibia III d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus III d0-0-1, v2-2-1. Femur IV p0-0-1, r0-0-1; tibia IV d1-1-0, v1-2-2, p1-1-0, r1-1-0; metatarsus IV d0-0-1, v2-2-1.

ABDOMEN. Oval. Light brown with pale median band with some small extending branches laterally, with a few paired, darker marks along median pale band (Fig. 14).

GENITALIA. Epigynum with large wave-like epigynal flap; lateral epigynal grooves wide and curved (Fig. 15). Internal genitalia with copulatory ducts short; seminal receptacles not observed; spermathecae oval; fertilization ducts long (Fig. 16).

### Natural history

Except for three females collected by beating, all specimens were collected in the moss hanging from trees.

### Distribution

Ecuador: known only from the type locality.

*Katissa yaya* sp. nov.

[urn:lsid:zoobank.org:act:24956AEC-8F8D-4055-86B9-3253544FDE10](https://zoobank.org/act:24956AEC-8F8D-4055-86B9-3253544FDE10)

Figs 17–21

### Diagnosis

Males can be distinguished from all species by their elongated, serrated palpal retrolateral tibial apophysis with small dorsal spur, from *K. guayasamini* sp. nov. by the closely positioned dorsal spur (Fig. 18), remotely positioned in the latter species (Fig. 23). Females are distinguished by their knob-like epigynal flap (Fig. 20).

### Etymology

The specific name is a noun in apposition taken from the Kichwa language meaning ‘large’.

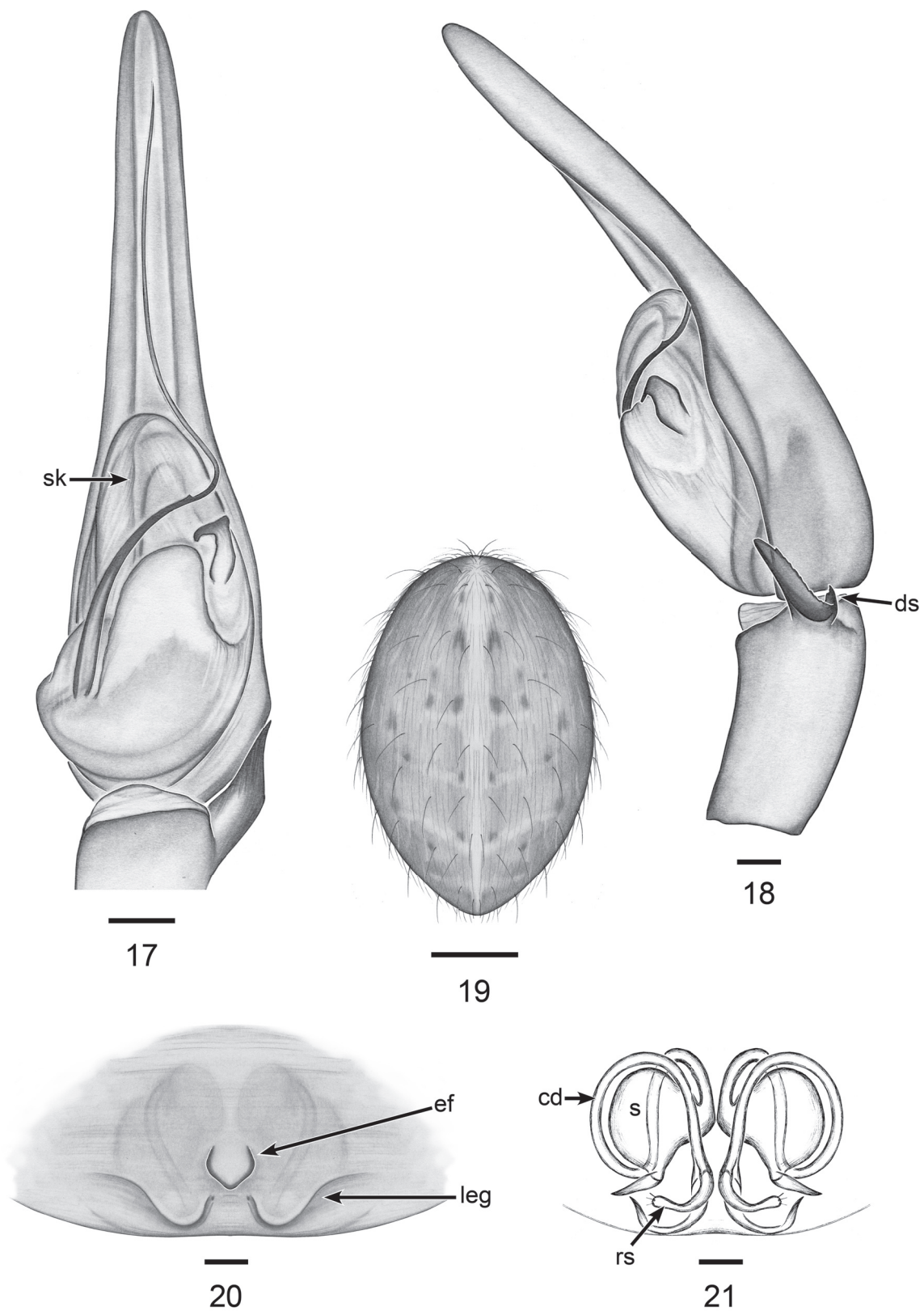
### Type material

#### Holotype

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, 2225 m, 4–7 Sep. 2014, hand collected in moss, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).

#### Other material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♀, sifting moss, -00.41941° S, -78.99607° W, 1717 m, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ); 1 ♂, 2 ♀♀, beating trees, 4–7 Sep. 2014, 1700 m, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 2 ♂♂, 4 ♀♀, sifting moss, E. Tapia, C. Tapia and N. Dupérré leg. (AMNH); 1 ♀, sifting moss, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).



**Figs 17–21.** *Katissa yaya* sp. nov. **17.** ♂, palp, ventral view. **18.** ♂, palp, retrolateral view. **19.** ♀, abdomen, dorsal view. **20.** ♀, epigynum, ventral view. **21.** ♀, internal genitalia, dorsal view. Scale bars: 17–18, 20–21 = 0.1 mm; 19 = 1 mm.



## Description

### Male (holotype)

MEASUREMENTS. Total length: 7.1; carapace length: 3.2; carapace width: 2.5.

CEPHALOTHORAX. Pars cephalica light brown, with black mark near cephalic groove; pars thoracica yellowish, with a few dark marks dorsally along radiating lines; margin dark brown. Sternum light brown with two lateral dark brown bands, endites and labium dark brown.

CHELICERAE. Light brown basally, dark brown apically, excavated with antero-prolateral keel; promargin with 5, retromargin with 8 teeth.

LEGS. Femora I–IV light yellow with brown mark at base of macrosetae. Tibiae light yellow with dark bands basally and apically. Metatarsi and tarsi dark brown. Claws unipectinate, I–II with 6, III with 5, IV with 6 teeth. Total length: I: 16.0; II: 15.1; III: 10.9; IV: 14.5; leg formula 1423; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 4.5/1.2/4.6/3.9/1.8; leg II 4.1/1.2/4.3/3.9/1.6; leg III 3.0/1.1/2.5/3.2/1.1; leg IV 3.8/1.2/3.3/4.7/1.5.

LEGS SPINATION. Femur I p1-1-1, r1-1-1; tibia I v2-2-2, p1-1-1, r1-1-0; metatarsus I v2-2-0, p1-1-0, r1-1-0. Femur II p1-1-1, r1-1-1; tibia II v2-2-2, p0-1-1, r1-1-0; metatarsus II v2-2-0, p0-1-0, r1-0-0. Femur III p1-1-1, r1-1-1; tibia III d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus III d0-1-0, v2-2-2. Femur IV p0-1-1, r0-0-1; tibia IV d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus IV d0-1-0, v2-2-2.

ABDOMEN. Elongated oval. Light gray with whitish pale median bands with small branches laterally, with a few dark spots along midline and laterally.

GENITALIA. Palpal tibia shorter than cymbium; elongated, serrated palpal retrolateral tibial apophysis with closely positioned basal spur (Fig. 18). Subtegulum pointed apically, with keel; tegulum rounded basally; ventral tegular process wide, rounded apically reaching median apophysis tip; median apophysis short, hook-shaped; embolic base protruding prolaterally; embolus ribbon-like, long with proximal part black, distal part pale (Fig. 17).

### Female

MEASUREMENTS. Total length: 7.7; carapace length: 3.4; carapace width: 2.4.

CEPHALOTHORAX. As in male.

CHELICERAE. Brown, not excavated without antero-prolateral keel; promargin with 5, retromargin with 7 teeth.

LEGS. Femora I–II light yellow with brown mark at base of macrosetae. Femora III–IV light yellow with dark bands medially and apically. Tibiae light yellow with dark bands basally. Metatarsi I–II brown, metatarsi III–IV light yellow speckled with brown. Tarsi brown. Claws as in male. Palpal claws with 5 teeth. Total length: I: 12.2; II: 11.7; III: 9.3; IV: 12.3; leg formula 4123; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 3.5/1.2/3.2/2.8/1.5; leg II 3.2/1.2/3.2/2.7/1.4; leg III 2.5/1.1/2.1/2.7/0.9; leg IV 3.1/1.2/2.8/3.9/1.4.

LEGS SPINATION. Femur I p1-1-1, r0-1-0; tibia I v2-2-0, p0-1-1, r1-1-0; metatarsus I v2-2-0. Femur II p1-1-1, r0-1-0; tibia II v2-2-0, p0-1-1, r0-1-0; metatarsus II v2-0-0. Femur III p0-0-1, r0-1-1; tibia III d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus III d0-1-0, v2-2-2. Femur IV p0-0-1, r0-1-1; tibia IV d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus IV d0-0-1, v2-2-2.

ABDOMEN. Oval. Light gray with whitish pale median band with small branches laterally, with a few dark spots along midline and laterally (Fig. 19).

GENITALIA. Epigynum with knob-like epigynal flap; lateral epigynal grooves strongly curved (Fig. 20). Internal genitalia with copulatory ducts elongated and thin; seminal receptacles positioned at beginning of copulatory ducts course; spermathecae oval; fertilization ducts short (Fig. 21).

### Natural history

Specimens were collected in moss from trees or beating trees.

### Distribution

Ecuador: known only from the type locality.

*Katissa guayasamini* sp. nov.

[urn:lsid:zoobank.org:act:948E2A23-5413-4572-AF09-BB7CAAD3C80C](https://doi.org/10.21203/rs.3.rs-1000000)

Figs 22–26

### Diagnosis

Males can be distinguished from all congeneric species by their elongated, serrated palpal retrolateral tibial apophysis with small dorsal spur (Fig. 23) and from *Katissa yaya* sp. nov. by features mentioned in the description. Females are distinguished by their elongated V-shaped epigynal flap (Fig. 25).

### Etymology

The specific name is in honor of the Ecuadorian painter, Oswald Guayasamin, in recognition of his unique art work, portraying the struggle of the Mestizo and indigenous people of Ecuador.

### Type material

#### Holotype

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, 24–30 May 2014, beating trees, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).

#### Other material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, beating trees, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♀, sifting litter, Berlese, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ); 1 ♀, moss from trees at 0.5–3 m high, 00.44461° S, 79.5107° W, 2225 m, 15 Oct. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Description

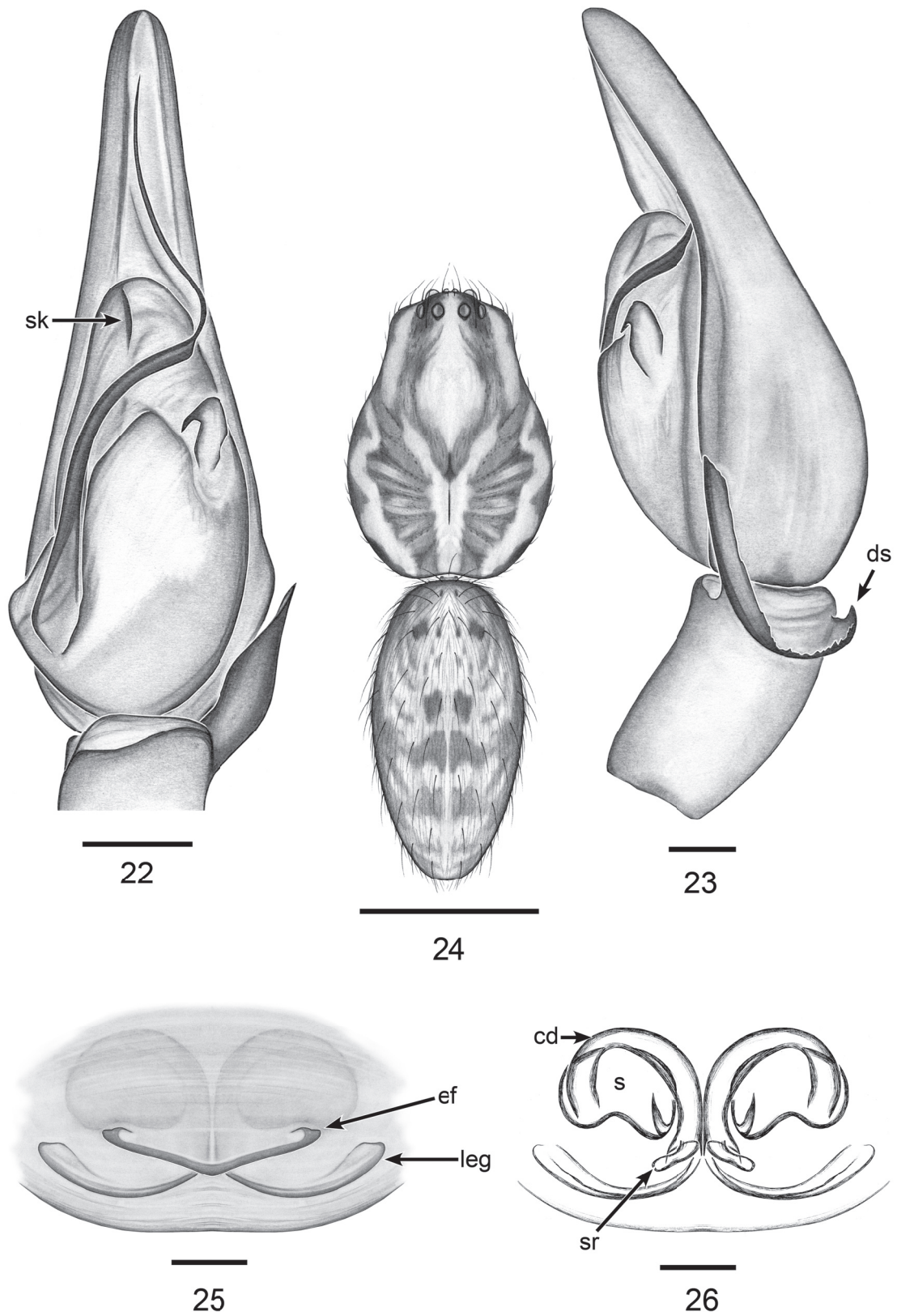
#### Male (holotype)

MEASUREMENTS. Total length: 3.2; carapace length: 1.8; carapace width: 1.7.

CEPHALOTHORAX. Pars cephalica and pars thoracica yellow with two dark brown, wide dorsal bands with black mesh pattern; margin dark brown (Fig. 24). Sternum light yellow with two dark brown bands laterally. Labium and endites dark brown.

CHELICERAE. Brown, excavated with antero-prolateral keel; promargin with 4, retromargin with 4–5 teeth.

LEGS. Femora I–II light yellow. Femora III–IV light yellow with basal and apical brown bands. Tibiae light yellow with dark band basally. Metatarsi light yellow and tarsi light. Claws unipectinate, I–II with



**Figs 22–26.** *Katissa guayasamini* sp. nov. **22.** ♂, palp, ventral view. **23.** ♂, palp, retrolateral view. **24.** ♂, habitus, dorsal view. **25.** ♀, epigynum, ventral view. **26.** ♀, internal genitalia, dorsal view. Scale bars: 22–23, 25–26 = 0.1 mm; 24 = 1 mm.

7 teeth and III–IV with 4 teeth. Total length: I: 7.1; II: 6.0; III: 4.5; IV: 6.4; leg formula 1423; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 1.8/0.7/2.0/1.7/0.9; leg II 1.6/0.7/1.6/1.4/0.7; leg III 1.2/0.6/1.0/1.1/0.6; leg IV 1.7/0.7/1.4/1.9/0.7. LEGS SPINATION. Femur I p0-1-1, r1-1-1; tibia I v2-2-2, p0-1-1, r0-1-1; metatarsus I v2-0-0, p1-1-0, r1-0-1. Femur II p1-1-1, r0-1-1; tibia II v2-2-2, p0-1-1, r0-1-1; metatarsus II v2-2-0, p1-1-0, r1-0-1. Femur III p0-1-1-, r0-1-1; tibia III d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus III d0-1-0, v2-2-0. Femur IV r0-0-1; tibia IV d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus IV d0-1-0, v2-2-0.

ABDOMEN. Elongated oval. Dorsally light brown with pattern of dark brown marks (Fig. 24). Covered with black erected setae and short none erected, pale setae.

GENITALIA. Palpal tibia shorter than cymbium; retrolateral tibial apophysis elongated, serrated with remotely positioned spur (Fig. 23). Subtegulum pointed apically with keel; tegulum rounded basally; ventral tegular process wide, pointed apically, not reaching median apophysis tip; median apophysis short, hook-shaped; embolic base protruding prolaterally; embolus ribbon-like, wide and short, completely dark (Fig. 22).

### **Female**

MEASUREMENTS. Total length: 3.4; carapace length: 1.7; carapace width: 1.6.

CEPHALOTHORAX. As in male.

CHELICERAE. Brown, not excavated without antero-prolateral keel; promargin with 3, retromargin with 6 teeth.

LEGS. As in male. Claws as in male. Palpal claws with 5 teeth. Total length: I: 7.1; II: 6.0; III: 4.5; IV: 6.4; leg formula 1423; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 1.8/0.7/2.0/1.7/0.9; leg II 1.6/0.7/1.6/1.4/0.7; leg III 1.2/0.6/1.0/1.1/0.6; leg IV 1.7/0.7/1.4/1.9/0.7.

LEGS SPINATION. Femur I p0-1-1; tibia I v2-2-0, p0-1-1, r0-0-1; metatarsus I v2-0-0, p0-1-0, r0-1-0. Femur II p0-0-1; tibia II v2-2-0, p0-1-1, r0-0-1; metatarsus II v2-0-0, p0-1-0, r0-1-0. Femur III p0-0-1-, r0-0-1; tibia III d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus III d0-1-0, v2-2-1. Femur IV p0-0-1, r0-0-1; tibia IV d1-1-0, v2-2-2, p1-1-0, r1-1-0; metatarsus IV d0-1-0, v2-2-1.

ABDOMEN. Oval. Colouration as in male.

GENITALIA. Epigynum with V-shaped epigynal flap; lateral epigynal grooves curved (Fig. 25). Internal genitalia; copulatory ducts short and wide; seminal receptacles positioned at beginning of copulatory ducts course; spermathecae kidney-shaped; fertilization ducts very short (Fig. 26).

### **Natural history**

Most specimens were collected by beating trees and from moss on trees, but one was collected while sifting litter.

### **Distribution**

Ecuador: known only from the type locality.

*Shuyushka* gen. nov.

[urn:lsid:zoobank.org:act:22C28CEB-BAE6-4902-8657-9A922D775514](https://zoobank.org/act:22C28CEB-BAE6-4902-8657-9A922D775514)

**Type species**

*Shuyushka wachi* gen. et sp. nov.

**Diagnosis**

*Shuyushka* gen. nov. can be distinguished from other Anyphaeninae genera by the presence of the following characters: tracheal spiracle in the middle of abdomen; lateral margin of endites concave; posterior eye row procurved; prolateral apex of tibia I with patch of short setae (Fig. 40). From *Wulfilopsis* Soares & Camargo, 1955 by the presence of ventral patellar apophysis (Figs 29, 34, 39) absent in the latter genera; from *Thaloe* Brescovit, 1997 by the absence of medial projections on the lateral margin of the endites, present in the latter (Brescovit 1997: fig. 41). Females of *Shuyushka* gen. nov. are also distinguished by the absence of lateral epigynal grooves (Figs 30, 35).

**Etymology**

The generic name is taken from the Kichwa language meaning ‘spotted’ for the dark marks on the abdomen. The gender is feminine.

**Composition**

*Shuyushka achachay* gen. et sp. nov., *S. moscai* gen. et sp. nov. and *S. wachi* gen. et sp. nov.

**Distribution**

Ecuador.

**Description**

**Male**

MEASUREMENTS. Medium (5.9–7.8 mm) size spiders.

CEPHALOTHORAX. Sub-rectangular, narrower anteriorly, slightly longer than wide, pars cephalica not elevated; longitudinal fovea short and shallow (Fig. 27). Chilum present, trapezoidal. Clypeus low (1x AME). Endites longer than wide, lateral margin concave medially. Labium longer than wide, constricted submedially, apex excavated. Sternum oval, flat, longer than wide. Precoxal triangular present.

CHELICERAE. Oblique and robuste, geniculate, promargin and retromargin with 4-5 teeth.

EYES. Eight eyes; AME smallest, less than half the diameter of the others; LE-PME about the same size; AME touching; AME-ALE almost touching, LE contiguous, LE-PME separated by half their width; PME separated by half their width; posterior eye row slightly procurved in dorsal view (Fig. 27).

LEGS. Trochanters notched; scopula sparse, entire on metatarsi and tarsi I–II; absent on metatarsi III–IV, entire on tarsi III–IV; apex of metatarsi III–IV with apical brush; prolateral apex of tibia I with patch of short setae (Fig. 40). Tarsal claws with 5–6 teeth. Legs formula 1423.

LEGS SPINATION RECURRENCE. Femora I–IV d1-1-1, r0-1-1; patellae III–IV r1; tibiae III–IV d1-0-0, v2-2-2; metatarsi I–II v2-1-0, r0-1-0, metatarsi III–IV v1-1-1.

ABDOMEN. Elongated cylindrical, covered with a mix of pale and dark short, none-erected setae and a few dark erected setae; tracheal spiracle recurved, situated in the middle between spinnerets and epigastric groove.

GENITALIA. Palpal femur without apophysis. Palpal patella with two ventral apophyses, and one dorsal apophysis (Figs 29, 34, 39). Palpal tibia short, shorter than cymbium; with (Figs 29, 34) or without blunt ventral apophysis (Fig. 39); retrolateral tibial apophysis bipartite, anterior part globular (Figs 29, 39), triangular (Fig. 34) and less sclerotized, posterior part well sclerotized, elongated (Figs 29, 34) or with short spine (Fig. 39). Subtegulum rounded apically; tegulum rounded basally; median apophysis large, hook-shaped; embolus black, heavily sclerotized, prolaterally positioned, wide basally, distally with small triangular extensions and pale terminal segment (Figs 28, 33, 38).

### **Female**

MEASUREMENTS. Medium (5.6–5.7 mm) size spiders.

CEPHALOTHORAX AND EYES. As in male.

LEGS. As in male; somewhat shorter in relation to length of the body. Tarsi and metatarsi I–II with dense, entire scopula, metatarsi III–IV without scopula, tarsi III–IV with dense, entire scopula; metatarsi III–IV with apical brush; prolateral apex of tibia I with patch of short setae. Legs formula 4123. Palpal claws with 4 teeth.

LEGS SPINATION RECURRENCE. Femora I–IV d1-1-1; patellae III–IV r1; tibiae I–II v2-2-0; tibiae III–IV d1-0-0, p1-1-1; metatarsi I–II v2-0-0, metatarsi III–IV d0-1-0, v2-2-2, r1-1-1, p1-1-1.

ABDOMEN. Oval; covered with a mix of pale and dark short, none-erected setae and a few dark erected setae; tracheal spiracle recurved, situated in the middle between spinnerets and epigastric groove.

GENITALIA. Epigynum well sclerotized with (Fig. 35) or without epigynal flap (Fig. 30); copulatory openings situated lateromedially (Figs 30, 35). Internal genitalia with large copulatory ducts; spermathecae not well defined, seminal receptacles positioned at the middle of copulatory ducts course; fertilization ducts long and curved (Fig. 31) or straight (Fig. 36).

*Shuyushka wachi* gen. et sp. nov.

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Figs 27–31

### **Diagnosis**

Males are distinguished by the rounded, clavate posterior part of the retrolateral tibial apophysis (Fig. 29); excavated and rugose in *S. moscai* gen. et sp. nov. (Fig. 34); from *S. achachay* gen. et sp. nov. by their large and rounded ventral tibial apophysis (Fig. 29), absent in the latter (Fig. 39). Females are distinguished by their slit-like copulatory openings (Fig. 30).

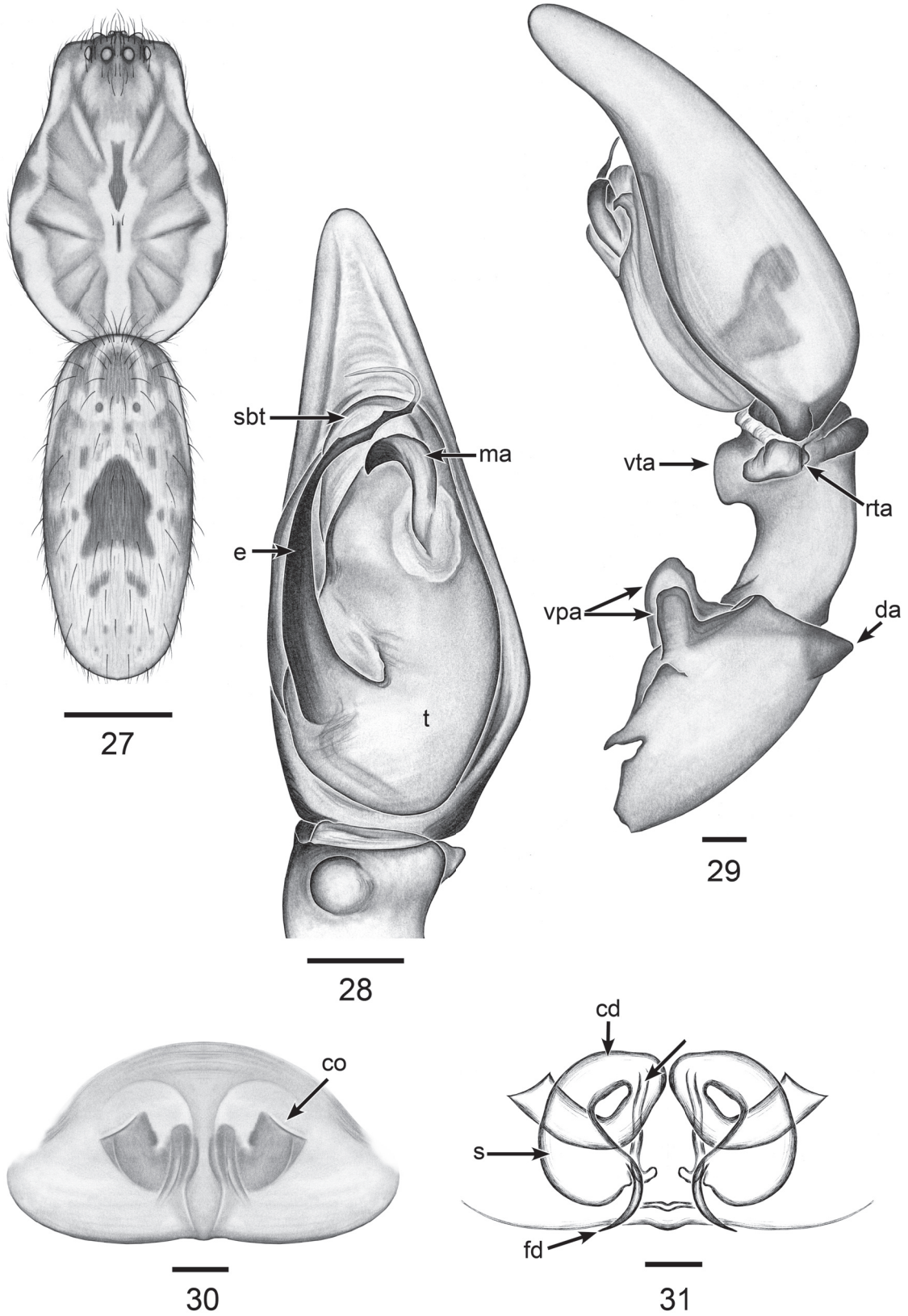
### **Etymology**

The specific name is a noun in apposition taken from the Kichwa language meaning ‘arrow’, for the arrow-shape marks found on the abdomen.

### **Type material**

#### **Holotype**

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, 24–30 May 2014, sifting moss, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).



**Figs 27–31.** *Shuyushka wachi* gen. et sp. nov. **27.** ♂, habitus, dorsal view. **28.** ♂, palp, ventral view. **29.** ♂, palp, retrolateral view. **30.** ♀, epigynum, ventral view. **31.** ♀, internal genitalia, dorsal view. Scale bars: 28–31 = 0.1 mm; 27 = 1 mm.

### Other material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 3 ♂♂, beating trees, 1 ♂, general collecting, 1 ♀, hand collecting, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♀, sifting moss, 00.42261° S, 79.5107° W, 2225 m, 8–21 Jun. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 1 ♀, hand collected in moss, 1 ♀, moss, Berlese, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 1 ♀, moss from trees 0.5–3 m above the ground, Berlese, 00.41433° S, 79.00035° W, 1888 m, 15 Oct. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (AMNH); 1 ♀, moss from trees 0.5–3 m above the ground, Berlese, 27 Oct. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ); 1 ♀, beating, 01.66015° S, 78.66199° W, 1845 m, 13 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♀, moss, Berlese, 13–15 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Description

#### Male (holotype)

MEASUREMENTS. Total length: 5.9; carapace length: 2.7 carapace width: 2.0; abdomen length: 3.2.

CEPHALOTHORAX. Pars cephalica apically orange-brown with dark lines behind PLE, basally light yellow; pars thoracica apically light yellow with dark arrow-shaped mark, medially orange-brown with dark lines along radiating lines, basally light yellow; margin dark (Fig. 27). Fovea dark. Sternum light brown, margin slightly darker. Labium and endites dark brown.

CHELICERAE. Dark brown; promargin with 4, retromargin with 5 teeth.

LEGS. Femora light yellow with brown band apically, tibiae and metatarsi light yellow with brown bands basally and apically, tarsi light yellow. Total length: I: 8.9; II: 8.2; III: 6.5; IV: 8.8; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 2.4/0.9/2.4/2.2/1.0; leg II 2.2/0.9/2.0/2.1/1.0; leg III 1.9/0.9/1.2/1.8/0.7; leg IV 2.3/0.8/2.0/2.8/0.9.

LEGS SPINATION. Femur I p0-1-1; tibia I p1-1-1, r1-1-1; metatarsus I p0-1-0. Femur II p1-1-1; tibia II p1-1-1, r1-1-1; metatarsus II p1-1-0. Femur III p0-1-1; tibia III p0-1-1, r1-1-1; metatarsus III p1-1-1, d0-1-1, v2-2-2. Femur IV p0-1-1; tibia IV p1-1-1, r1-1-1; metatarsus IV p1-1-1, d0-1-1, v2-2-2.

ABDOMEN. Cylindrical. Dorsally yellowish with dark arrow-shaped mark dorsally and few dorsal and lateral dark markings (Fig. 27).

GENITALIA. Palpal patella with two large, ventral apophyses, and a large dorsal apophysis (Fig. 29). Palpal tibia shorter than cymbium; with a large and rounded ventral apophysis; retrolateral tibial apophysis anterior part small, globular, posterior part club-shaped well sclerotized (Fig. 29). Subtegulum rounded apically; tegulum rounded basally; median apophysis large, hooked; embolus short, wide basally, prolaterally positioned, distally with small triangular extensions and strongly recurved pale terminal segment (Fig. 28).

#### Female

MEASUREMENTS. Total length: 5.6; carapace length: 2.6; carapace width: 2.0; abdomen length: 3.0.

COLOURATION. As in male but slightly darker.

CEPHALOTHORAX AND ABDOMEN. As in male.

CHELICERAE. Promargin with 4, retromargin with 5 teeth.



LEGS. As in male. Total length: I: 7.8; II: 7.2; III: 6.5; IV: 8.1; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 2.3/0.9/2.0/1.6/1.0; leg II 2.1/0.9/1.8/1.6/0.8; leg III 1.9/0.9/1.4/1.6/0.7; leg IV 2.2/0.9/1.9/2.3/0.8.

LEGS SPINATION. Femur I p0-1-1. Femur II p0-0-1; tibia II p0-1-1. Femur III p0-1-1-, r0-1-1; tibia III v2-1-2, r1-1-1. Femur IV p0-0-1, r0-0-1; tibia IV v2-2-2, r0-1-1.

GENITALIA. Epigynum with long, narrow copulatory openings (Fig. 30). Internal genitalia; copulatory ducts wide and curved; seminal receptacles elongated and narrow, positioned in midway of the copulatory ducts course; spermathecae large, without definite form; fertilization ducts thin and curved (Fig. 31).

### Natural history

Specimens were mostly collected in moss hanging from trees and by beating.

### Distribution

Ecuador: known only from the type locality.

*Shuyushka moscai* gen. et sp. nov.

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Figs 32–36

### Diagnosis

Males are easily distinguished from all congeneric species by their large patellar apophysis (Fig. 34), from *S. wachi* gen. et sp. nov. by the sinuous end of the male embolus (Fig. 33), strongly curved in the latter species. Females are distinguished by their V-shaped epigynal flap and hook-shaped copulatory openings (Fig. 35).

### Etymology

The specific name is in honour of Dr. Franco Mosca, scientist and surgeon, for his contribution to Otonga Foundation.

### Type material

#### Holotype

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, 24–30 May 2014, beating trees, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).

#### Other material examined

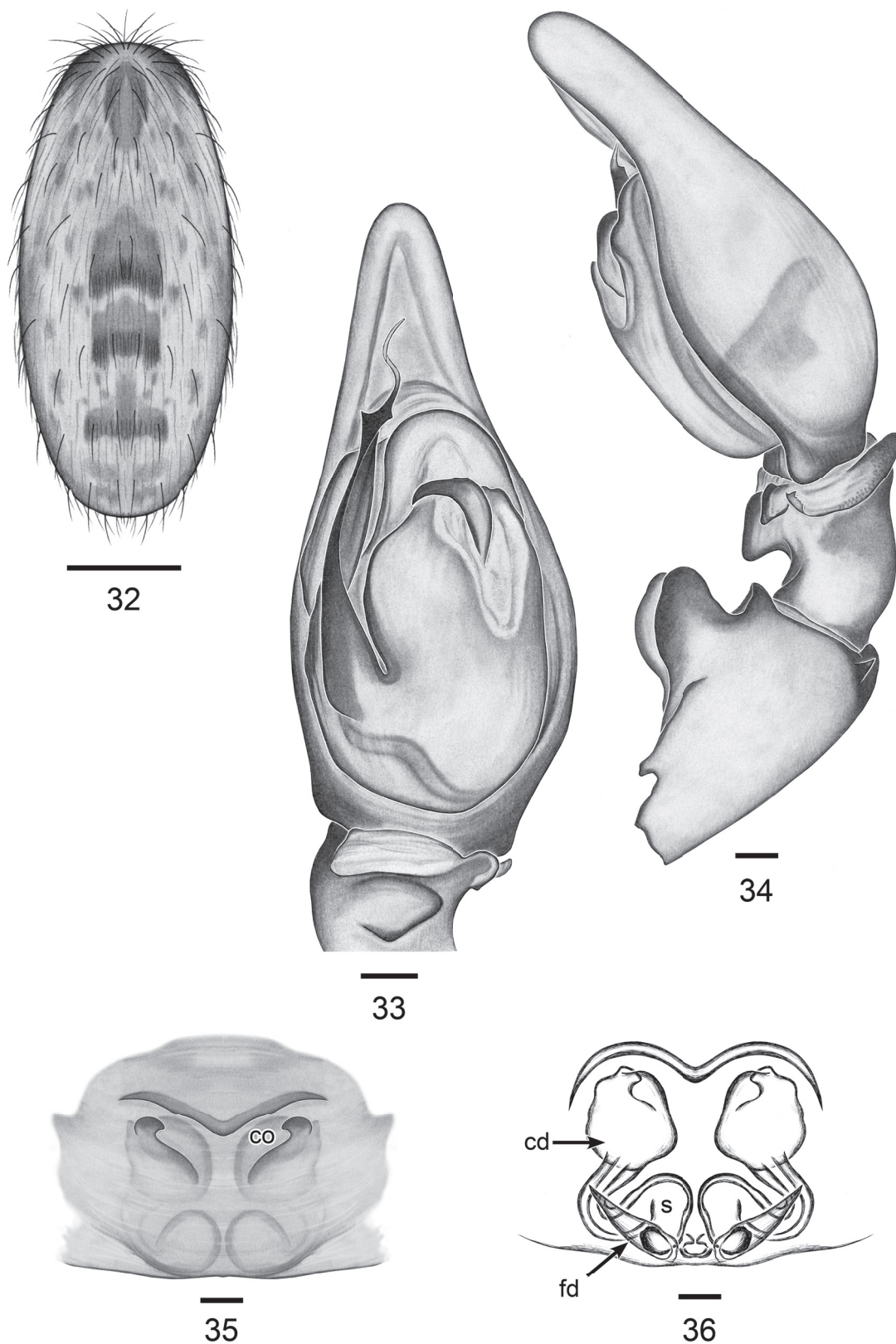
ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 3 ♂♂, 3 ♀♀, beating trees, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 2 ♀♀, moss from trees 0.5–3 m above the ground, Berlese, 00.41433° S, 79.00035° W, 1888 m, 15 Oct. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Description

#### Male (holotype)

MEASUREMENTS. Total length: 7.7; carapace length: 3.3 carapace width: 2.4; abdomen length: 4.4.

CEPHALOTHORAX. Pars cephalica apically brown with dark lines behind PLE, basally yellow; pars thoracica apically yellow with small dark mark, medially brown with dark lines along radiating lines,



**Figs 32–36.** *Shuyushka moscai* gen. et sp. nov. **32.** ♂, abdomen, dorsal view. **33.** ♂, palp, ventral view. **34.** ♂, palp, retrolateral view. **35.** ♀, epigynum, ventral view. **36.** ♀, internal genitalia, dorsal view. Scale bars: 33–36 = 0.1 mm; 32 = 1 mm.

basally yellow, margin dark. Fovea dark. Sternum light brown, with two wide lateral dark bands. Labium and endites dark brown.

CHELICERAE. Dark brown; promargin with 5, retromargin with 5 teeth.

LEGS. Legs light yellow with dark spotted pattern. Total length: I: 11.3; II: 9.8; III: 7.5; IV: 11.0; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 3.0/0.9/3.1/2.8/1.5; leg II 2.7/0.9/2.6/2.3/1.3; leg III 2.2/0.8/1.5/2.2/0.8; leg IV 2.8/0.9/2.6/3.5/1.2.

LEGS SPINATION. Femur I p1-1-1; tibia I p1-1-1, r0-1-1; metatarsus I p0-1-0. Femur II p1-1-1; tibia II p1-1-1, r0-1-1; metatarsus II p0-1-0. Femur III p0-1-1; tibia III p1-1-1, r0-1-1; metatarsus III p1-1-1, d0-1-1, v1-1-2. Femur IV p0-1-1; tibia IV p1-1-1, r0-1-1; metatarsus IV p1-1-1, d0-1-0, v1-1-2.

ABDOMEN. Cylindrical. Dorsally yellowish dark marks medially and a few small dark spots laterally (Fig. 32).

GENITALIA. Palpal patella with two large, ventral apophyses, and dorsal triangular apophysis (Fig. 34). Palpal tibia shorter than cymbium; with triangular apophysis ventrally; anterior part of retrolateral tibial apophysis small and triangular, posterior part excavated and rugose (Fig. 34). Subtegulum rounded apically; tegulum rounded basally; median apophysis short, hook-shaped; embolus short, wide basally, prolaterally positioned, distally with triangular extensions and S-shaped pale terminal segment (Fig. 33).

#### **Female**

MEASUREMENTS. Total length: 5.7; carapace length: 2.8; carapace width: 2.1; abdomen length: 2.9.

COLOURATION. As in male but slightly darker.

CEPHALOTHORAX AND ABDOMEN. As in male.

CHELICERAE. Promargin with 5, retromargin with 5 teeth.

LEGS. As in male. Total length: I: 8.3; II: 7.6; III: 6.4; IV: 8.6; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 2.4/0.9/2.0/1.9/1.1; leg II 2.3/0.9/1.9/1.6/0.9; leg III 1.8/0.9/1.2/1.9/0.6; leg IV 2.5/0.9/1.9/2.4/0.9.

LEGS SPINATION. Femur I p0-1-1. Femur II p1-1-1; tibia II p0-1-1. Femur III p0-1-1, r0-1-1; tibia III v2-1-2, r1-1-1. Femur IV p0-1-1, r0-0-1; tibia IV v2-2-2, r1-1-1.

GENITALIA. Epigynum with V-shaped, well sclerotized epigynal flap; copulatory openings hook-shaped (Fig. 35). Internal genitalia; copulatory ducts globular; spermathecae not well defined, small and elongated; fertilization ducts wide and elongated (Fig. 36).

#### **Natural history**

Most specimens were collected by beating trees or from moss hanging from trees.

#### **Distribution**

Ecuador: known only from the type locality.

*Shuyushka achachay* gen. et sp. nov.

[urn:lsid:zoobank.org:act:409AFE79-731C-47C2-A21F-507B7D083A1D](https://doi.org/10.3897/ejt.255.409AFE79-731C-47C2-A21F-507B7D083A1D)

Figs 37–40

**Diagnosis**

Males are distinguished from all congeneric species by their distinctly reduced patellar apophysis (Fig. 39).

**Etymology**

The specific name is a noun in apposition taken from the Kichwa language meaning ‘cold’.

**Type material**

**Holotype**

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, 24–30 May 2014, beating trees, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).

**Additional material examined**

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 2 ♂♂, sifting moss, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

**Description**

**Male (holotype)**

MEASUREMENTS. Total length: 7.3; carapace length: 3.0; carapace width: 2.2; abdomen length: 4.3.

CEPHALOTHORAX. Pars cephalica apically light orange-brown, with dark lines behind PLE, basally light yellow; pars thoracica apically light yellow, with small dark mark, medially orange-brown with dark lines along radiating lines, basally light yellow; margin dark. Fovea dark. Sternum light brown, margin slightly darker. Labium and endites dark brown.

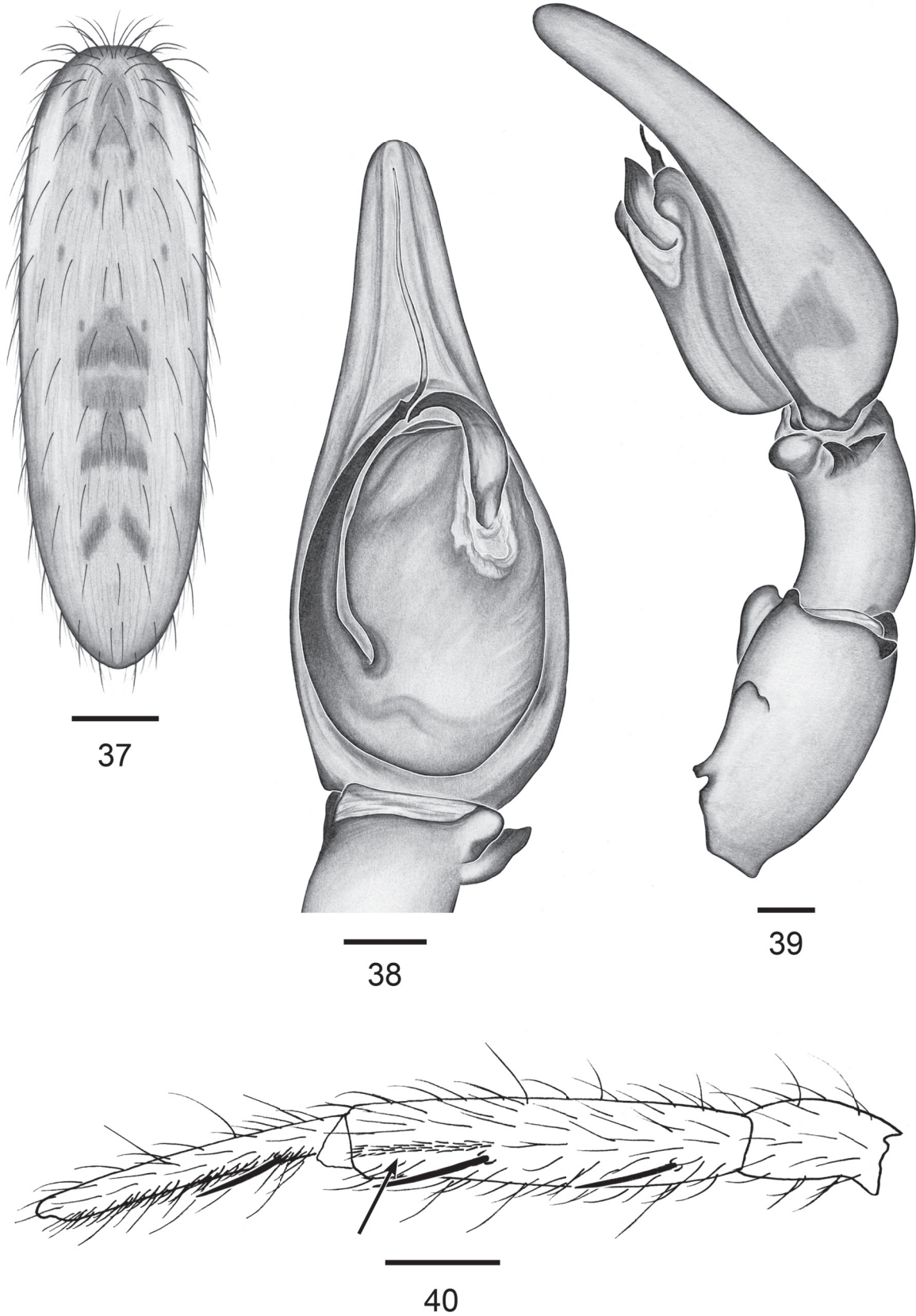
CHELICERAE. Dark brown. Promargin with 5, retromargin with 5 teeth.

LEGS. Femora light yellow with orange-brown band apically, tibia and metatarsi light yellow with orange-brown bands basally and apically, tarsi light yellow. Total length: I: 12.7; II: 10.2; III: 7.8; IV: 10.7; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 3.3/0.9/3.6/3.5/1.4; leg II 2.8/0.9/2.7/2.6/1.2; leg III 2.3/0.8/1.6/2.3/0.8; leg IV 2.9/0.9/2.5/3.3/1.1.

LEGS SPINATION. Femur I p1-1-1; tibia I p1-1-1, r1-1-1; metatarsus I p0-1-0. Femur II p1-1-1; tibia II p1-1-1, r1-1-1; metatarsus II p1-1-0. Femur III p0-1-1; tibia III p1-1-1, r1-1-1; metatarsus III p1-1-1, d0-1-0, v2-2-2. Femur IV p0-1-1; tibia IV p1-1-1, r1-1-1; metatarsus IV p1-1-1, d0-1-0, v2-2-2.

ABDOMEN. Cylindrical. Dorsally yellowish with dark arrow-shaped mark (Fig. 37).

GENITALIA. Palpal patella with two small, ventral apophysis, and small dorsal sclerotized triangular projection (Fig. 39). Palpal tibia shorter than cymbium; without apophysis ventrally; anterior part of retrolateral tibial apophysis rounded, posterior part well sclerotized with spine-like projection (Fig. 39). Subtegulum not observed; tegulum rounded basally; median apophysis large, hook-shaped; embolus long, wide basally, prolaterally positioned, distally with small triangular extensions and straight pale terminal segment (Fig. 38).



**Figs 37–40.** *Shuyushka achachay* gen. et sp. nov. 37. ♂, abdomen, dorsal view. 38. ♂, palp, ventral view. 39. ♂, palp, retrolateral view. 40. ♂, tibia I, prolateral view. Scale bars: 38–39 = 0.05 mm; 37, 40 = 1 mm.

### Female

Unknown.

### Natural history

Specimens were collected by beating trees and in moss hanging from trees.

### Distribution

Ecuador: known only from the type locality.

*Patrera* Simon, 1903

### Type species

*Patrera fulvastra* Simon, 1903.

### Composition

*Patrera apora* (Chamberlin, 1916), *P. armata* (Chickering, 1940), *P. auricoma* (L. Koch, 1866), *P. cita* (Keyserling, 1891), *P. fulvastra* Simon, 1903, *P. hatunkiru* sp. nov., *P. lauta* (Chickering, 1940), *P. longipes* (Keyserling, 1891), *P. philipi* sp. nov., *P. procera* (Keyserling, 1891), *P. puta* (O. Pickard-Cambridge, 1896), *P. ruber* (F.O. Pickard-Cambridge, 1900), *P. shida* sp. nov., *P. stylifer* (F.O. Pickard-Cambridge, 1900), *P. suni* sp. nov., *P. virgata* (Keyserling, 1891), *P. witsu* sp. nov.

### Diagnosis (adapted from Brescovit 1997: 31)

Distinguished by the combination of the following characters: carapace sub-rectangular (Fig. 54); tracheal spiracle in between the middle of the abdomen and the epigastric groove; lateral margin of endites concave. Males are further distinguished from *Katissa* by their short, not elongated palpal cymbium, and from *Shuyushka* gen. nov. by the absence of a ventral patellar apophysis present in the latter. Females are distinguished from *Katissa* and *Shuyushka* gen. nov. by the knob-like projection of the epigynum.

*Patrera philipi* sp. nov.

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Figs 41–45

### Diagnosis

Males are distinguished from all other species of the genus by their massive ventral tegular projection and thin, elongated embolus (Fig. 41). Females are distinguished by the lateral epigynal grooves curving inwardly (Fig. 44).

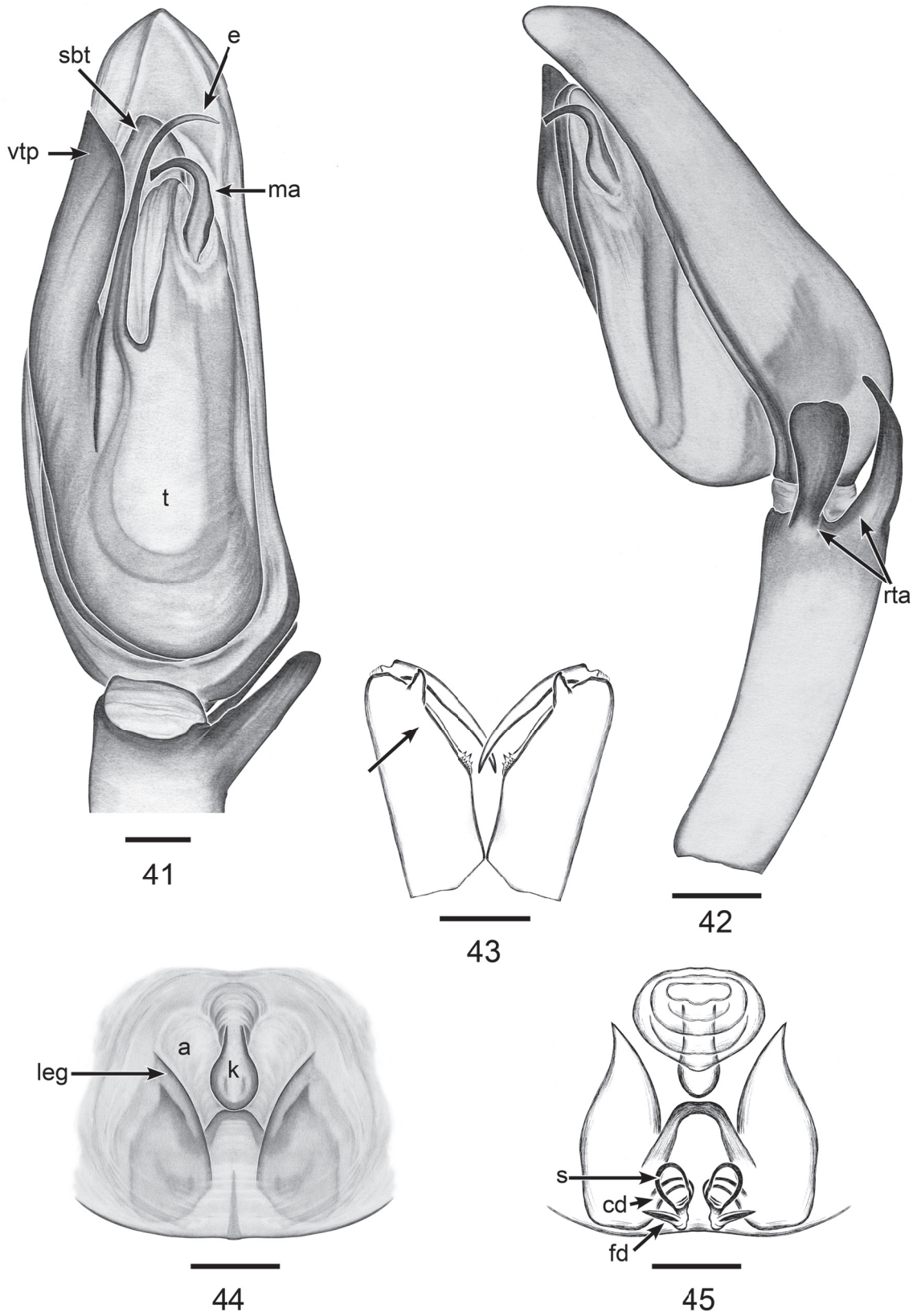
### Etymology

The specific name is in honour of Philip Bertkau.

### Type material

#### Holotype

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, 4–7 Sep. 2014, hand collected in moss, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).



**Figs 41–45.** *Patrera philipi* sp. nov. 41. ♂, palp, ventral view. 42. ♂, palp, retrolateral view. 43. ♂, chelicerae, posterior view. 44. ♀, epigynum, ventral view. 45. ♀, internal genitalia, dorsal view. Scale bars: 41–42, 44–45 = 0.1 mm; 43 = 0.5 mm.

### Other material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, 1 ♀, sifting moss, 1 ♂, general collecting, 6 ♂♂, 2 ♀♀, beating trees, 1 ♀, hand collecting, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 6 ♂♂, night collecting, 00.41941° S, 78.99607° W, 1717 m, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 7 ♂♂, 1 ♀, night collecting, 00.41564° S, 79.00425° W, 2105 m, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (AMNH); 4 ♂♂, 2 ♀♀, night collecting, 00.41994° S, 79.00623° W, 1997 m, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ); 3 ♂♂, 2 ♀♀, beating, 00.41564° S, 79.00425° W, 2105 m, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 4 ♂♂, general collecting, 5–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 1 ♀, beating, 3 ♀♀, sifting moss, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, beating, 00.42261° S, 79.5107° W, 2225 m, 12 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 2 ♀♀, sifting moss, 12 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 7 ♂♂, 6 ♀♀, beating, 01.66015° S, 78.66199° W, 1845 m, 13 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 5 ♀♀, Berlese, moss, 13–15 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Description

#### Male (holotype)

MEASUREMENTS. Total length: 3.9; carapace length: 1.7 carapace width: 1.5; abdomen length: 2.1.

CEPHALOTHORAX. Pars cephalica orange-brown, with pale dusk lines behind PLE; pars thoracica light orange-brown. Fovea dark. Sternum light yellow, margin slightly darker. Labium and endites yellow.

CHELICERAE. Orange-brown. Posterior side with large tooth, narrow and triangular; promargin with 3, retromargin with 6 teeth (Fig. 43).

LEGS. Femora yellow, tibiae, metatarsi and tarsi light yellow-orange. Total length: I: 11.0; II: 8.9; III: 5.3; IV: 7.7; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 2.7/0.8/3.3/3.0/1.2; leg II 2.3/0.7/2.6/2.4/0.9; leg III 1.5/0.6/1.2/1.5/0.5; leg IV 2.2/0.7/1.7/2.0/0.7.

LEGS SPINATION. Metatarsus I v1-1-0. Metatarsus II v1-1-0. Tibia III d1-0-0, v1-1-0; metatarsus III d0-1-0, v2-2-0. Tibia IV d1-0-0, v2-2-2; metatarsus IV d0-1-0, v2-2-1. Tarsal claws unipectinate; retrolateral claws I–IV with 4 teeth, prolateral claws I–IV with 7–8 teeth.

ABDOMEN. Oval. Dorsally yellowish with faint dark dusky chevrons.

GENITALIA. Palpal patella without apophysis. Palpal tibia shorter than cymbium (Fig. 42); anterior part of retrolateral tibial apophysis plate-like, posterior part distally acute (Fig. 42). Subtegulum pointed apically; tegulum oval basally; ventral projection of subtegulum well sclerotized; median apophysis short, hook-shaped; embolus wider basally, filiform and curved apically (Fig. 41).

#### Female

MEASUREMENTS. Total length: 3.7; carapace length: 1.4; carapace width: 1.1; abdomen length: 2.3.

CEPHALOTHORAX AND ABDOMEN. As in male.

CHELICERAE. Cheliceral promargin with 3, retromargin with 7 teeth.

LEGS. As in male. Total length: I: 6.2; II: 4.9; III: 3.3; IV: 4.9; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 1.6/0.5/1.7/1.6/0.8; leg II 1.3/0.5/1.2/1.3/0.6; leg III 0.9/0.4/0.7/0.9/0.4; leg IV 1.4/0.5/0.9/1.5/0.6. Tarsal claws unipectinate, retrolateral claws I–IV with 6 teeth, prolateral claws I–II with 12 teeth, prolateral claws III–IV with 8–9 teeth. Palpal claws with 4 teeth.



LEGS SPINATION. Femur I p0-1-1, r0-0-1; tibia I v2-2-0; metatarsus I v2-0-0. Femur II p0-0-1, r0-0-1; tibia II v2-2-2; metatarsus II v2-0-0. Femur III p0-0-1, r0-0-1; tibia III d0-0-1, v1-1-0; metatarsus III d0-0-1, v2-2-0. Femur IV p0-0-1, r0-0-1; tibia IV d0-0-1, v1-1-2; metatarsus IV d0-0-1, v2-1-1. GENITALIA. Epigynum with oval, elongated median protuberance; atrium small; lateral epigynal grooves curved inwardly (Fig. 44). Internal genitalia; short and curved copulatory ducts; spermathecae oval; fertilization ducts short, directed outwardly (Fig. 45).

### Natural history

Most specimens were collected by beating trees and during night collecting, a few were collected in moss hanging from trees.

### Distribution

Ecuador: known only from the type locality.

### *Patrera shida* sp. nov.

[urn:lsid:zoobank.org:act:48DFC3CA-BDE5-4121-8FD5-5224E3F06A7F](https://doi.org/10.3896/abris.48DFC3CA-BDE5-4121-8FD5-5224E3F06A7F)

Figs 46–48

### Diagnosis

Males are easily distinguished from all other congeneric species by the projecting basal part of the tegulum, and the presence of a bipartite ventral tegular projection (Fig. 46).

### Etymology

The specific name is a noun in apposition taken from the Kichwa language meaning ‘look-like’, for its resemblance to the type species.

### Type material

#### Holotype

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, 24–30 May 2014, hand collecting, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).

### Additional material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, beating trees, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Description

#### Male (holotype)

MEASUREMENTS. Total length: 3.2; carapace length: 1.5 carapace width: 1.3; abdomen length: 1.7.

CEPHALOTHORAX. Pars cephalica orange-brown; pars thoracica orange-brown. Fovea dark. Sternum light yellow, margin slightly darker. Labium and endites orange-brown.

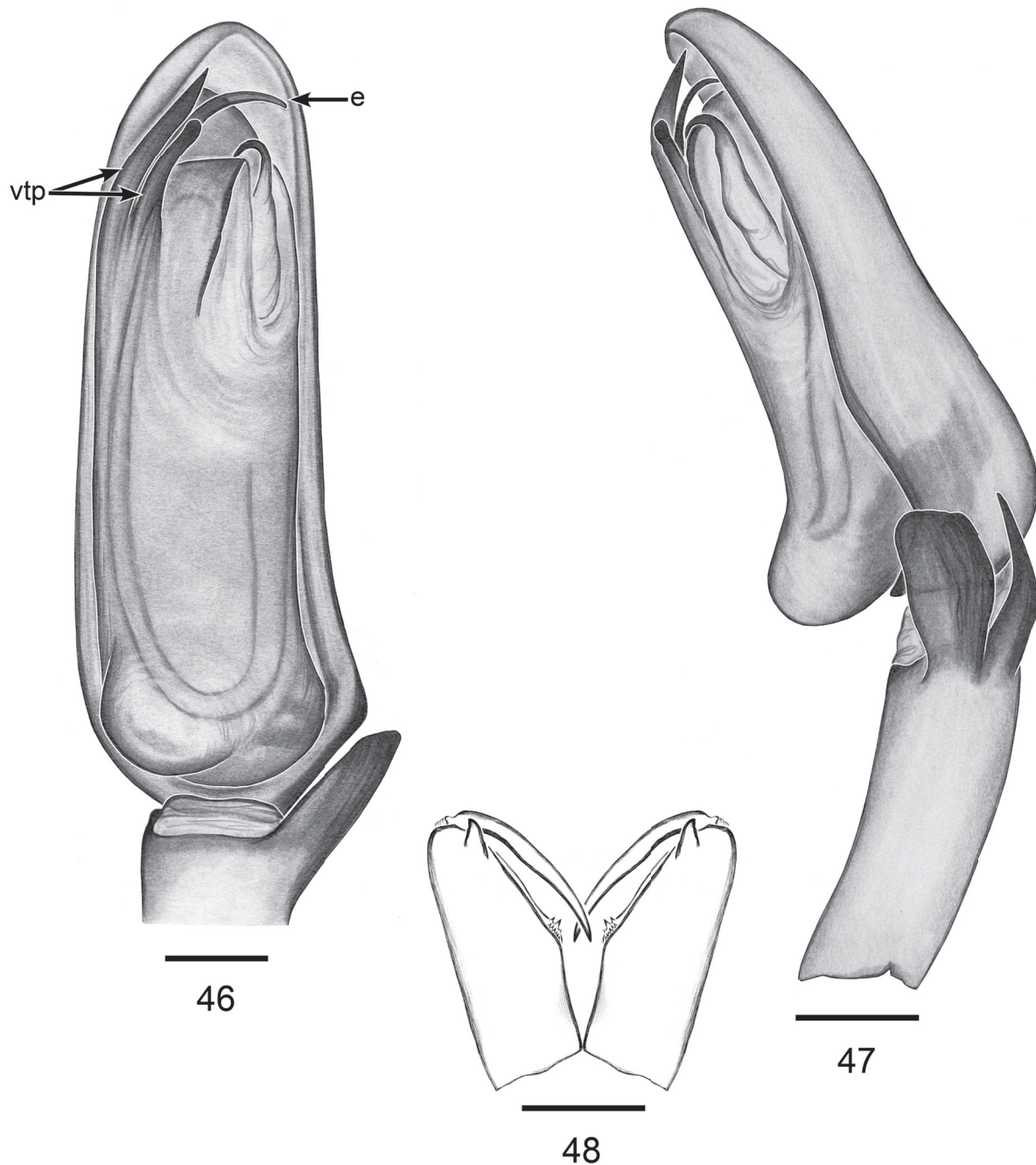
CHELICERAE. Orange-brown. Posterior side with large tooth, narrow and triangular; promargin with 3, retromargin with 6 teeth (Fig. 47).

LEGS. Femora yellow, tibiae, metatarsi and tarsi light yellow-orange. Total length: I: 9.4; II: 7.7; III: 4.5; IV: 6.5; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 2.3/0.6/2.6/2.7/1.2; leg II 2.0/0.6/2.2/2.1/0.8; leg III 1.2/0.5/0.9/1.4/0.5; leg IV 1.8/0.7/1.5/1.8/0.7.

LEGS SPINATION. (legs spines on prolateral and retrolateral side not observed, specimen damaged): Metatarsus I v2-0-0. Metatarsus II v2-0-0. Tibia III d0-1-1, v1-1-0; metatarsus III d0-1-1, v2-0-0. Tibia IV d0-1-1, v1-1-2; metatarsus IV d0-1-1, v2-1-2. Tarsal claws not observed.

ABDOMEN. Oval. Dorsally yellowish.

GENITALIA. Palpal patella without apophysis. Palpal tibia shorter than cymbium (Fig. 47); anterior part of retrolateral tibial apophysis plate-like, posterior part triangular (Fig. 47). Subtegulum not observed;



**Figs 46–48.** *Patrera shida* sp. nov. **46.** ♂, palp, ventral view. **47.** ♂, palp, retrolateral view. **48.** ♂, chelicerae, posterior view. Scale bars: 46–47 = 0.1 mm; 48 = 0.5 mm.

tegulum elongated oval with rounded swelling baso-prolaterally; ventral projection of tegulum well sclerotized, bipartite; median apophysis short, hook-shaped; ventral tegular projection, long and thin; embolus filiform and curved apically (Fig 46).

#### **Female**

Unknown.

#### **Natural history**

Specimens were either hand collected or collected by beating trees.

#### **Distribution**

Ecuador: known only from the type locality.

#### *Patrera witsu* sp. nov.

[urn:lsid:zoobank.org:act:1001CCDB-43B2-4ED6-B823-C30BFB35A9DC](https://zoobank.org/act:1001CCDB-43B2-4ED6-B823-C30BFB35A9DC)

Figs 49–53

#### **Diagnosis**

Males are easily distinguished from all congeneric species by their basally wide and twisted embolus and their large ventral tegular projection (Fig. 49). Females are distinguished by the shallow, pocket-like lateral epigynal grooves (Fig. 52).

#### **Etymology**

The specific name is a noun in apposition is taken from the Kichwa language meaning ‘twisted’, reflecting the twisted embolus of the male palp.

#### **Type material**

##### **Holotype**

ECUADOR: ♂, Cotopaxi Province, Otonga Biologica Reserve, 24–30 May 2014, night collecting, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).

##### **Other material examined**

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, night collecting, 1 ♀, beating trees, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 3 ♂♂, 2 ♀♀, night collecting, 00.42261° S, 79.5107° W, 2225 m, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 2 ♀♀, beating trees, 00.41564° S, 79.00425° W, 2105 m, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 2 ♀♀, general collecting, 5–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 1 ♀, beating, 00.42261° S, 79.5107° W, 2225 m, 12 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

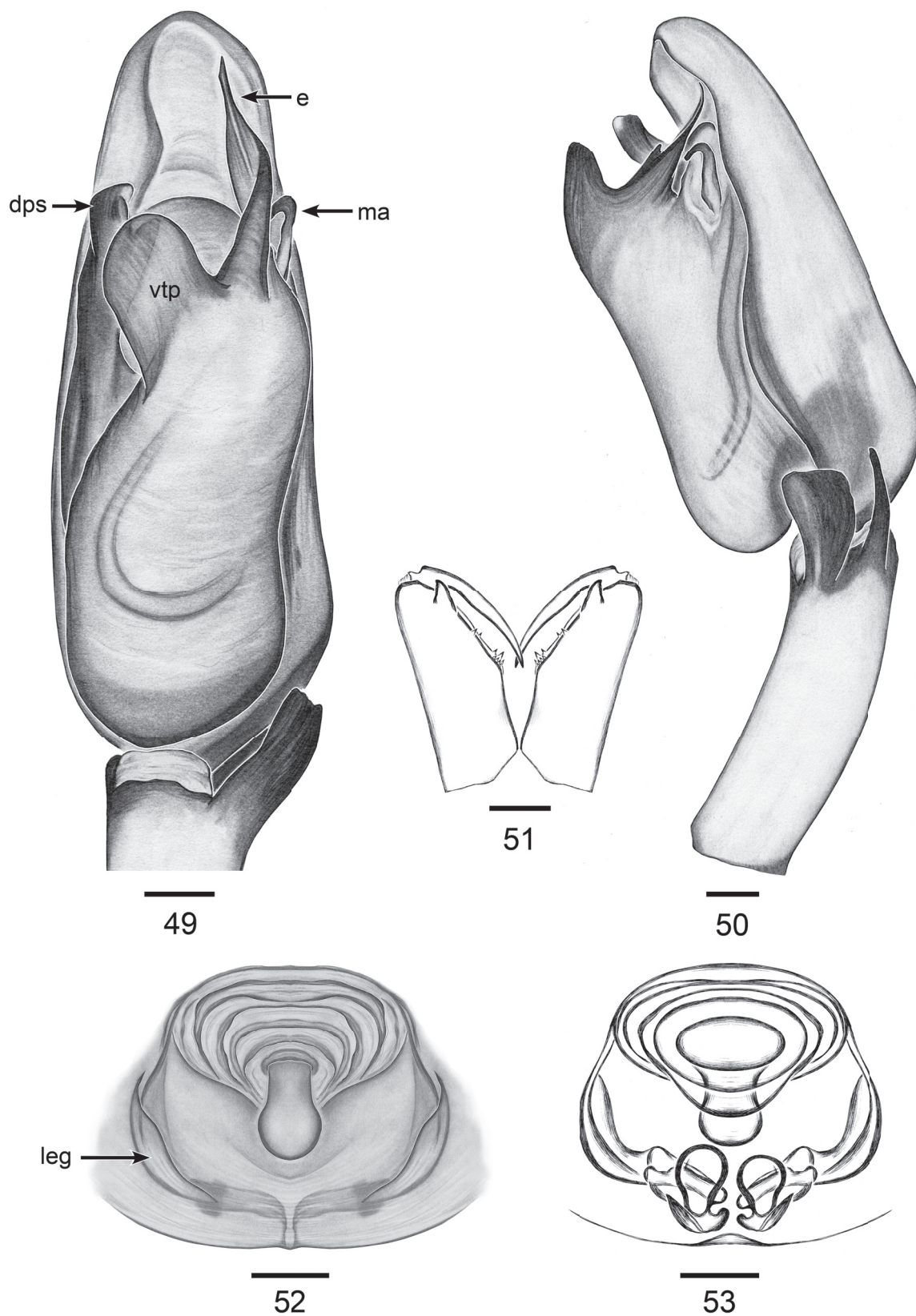
#### **Description**

##### **Male (holotype)**

MEASUREMENTS. Total length: 4.4; carapace length: 2.2 carapace width: 1.6; abdomen length: 2.2.

CEPHALOTHORAX. Pars cephalica light yellow with pale dusk lines behind PLE; pars thoracica light yellow. Fovea dark. Sternum light yellow, margin slightly darker. Labium and endites light orange-brown.

CHELICERAE. Chelicerae light orange-brown. Posterior side with large tooth, narrow and triangular; promargin with 4, retromargin with 5 teeth (Fig. 51).



**Figs 49–53.** *Patrera witsu* sp. nov. **49.** ♂, palp, ventral view. **50.** ♂, palp, retrolateral view. **51.** ♂, chelicerae, posterior view. **52.** ♀, epigynum, ventral view. **53.** ♀, internal genitalia, dorsal view. Scale bars: 49–50, 52–53 = 0.1 mm; 51 = 0.5 mm.

LEGS. Femora yellow, tibiae, metatarsi and tarsi light yellow-orange. Total length: I: 9.8; II: 8.5; III: 5.4; IV: 7.8; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 2.5/0.9/2.7/2.5/1.2; leg II 2.1/0.9/2.3/2.2/1.0; leg III 1.5/0.7/1.2/1.5/0.5; leg IV 1.9/0.8/1.9/2.4/0.8.

LEGS SPINATION. Metatarsus I v2-2-0. Metatarsus II v2-2-0. Tibia III d0-1-1, v2-2-1; metatarsus III d0-1-1, v2-2-0. Tibia IV d0-1-1, v2-2-2; metatarsus IV d0-1-1, v2-2-1. Tarsal claws unipectinate; retrolateral claws I–IV with 4–5 teeth, prolateral claws I–II with 10 teeth, prolateral claws III–IV with 5 teeth.

ABDOMEN. Oval. Dorsally yellowish with faint dusky chevrons.

GENITALIA. Palpal patella without apophysis. Palpal tibia shorter than cymbium (Fig. 50); anterior part of retrolateral tibial apophysis plate-like, posterior part thin, triangular (Fig. 50). Subtegulum rounded apically; tegulum elongated oval; dorsal projection of subtegulum well sclerotized with blunt tip; ventral projection of tegulum, large and plate-like; median apophysis short, hook-shaped; embolus wider basally, laminar and twisted (Fig. 49).

### Female

MEASUREMENTS. Total length: 5.5; carapace length: 2.2; carapace width: 1.7; abdomen length: 3.3.

CEPHALOTHORAX AND ABDOMEN. As in male.

CHELICERAE. Cheliceral promargin with 3 teeth, retromargin 7 teeth.

LEGS. As in male. Total length: I: 11.4; II: 10.2; III: 6.7; IV: 9.3; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 3.1/1.2/3.0/2.6/1.5; leg II 2.7/1.0/2.8/2.5/1.2; leg III 1.8/0.8/1.5/1.9/0.7; leg IV 2.6/0.9/2.1/2.8/0.9.

LEGS SPINATION. Femur I p1-1-1, r0-1-1; tibia I v2-2-0; metatarsus I v2-2-0. Femur II p1-1-1, r0-1-1; tibia II v2-2-0; metatarsus II v2-2-0. Femur III p0-0-1, r0-1-1; tibia III d0-1-1, v2-2-0; metatarsus III d0-1-1, v1-1-0. Femur IV p0-0-1, r0-0-1; tibia IV d0-1-1, v2-2-0; metatarsus IV d0-1-1, v1-1-0. Tarsal claws unipectinate; retrolateral claws I–IV with 6–7 teeth, prolateral claws I–II with 14 teeth, prolateral claws III–IV with 4 teeth. Palpal claws with 3 teeth.

GENITALIA. Epigynum with spatula-like median knob; atrium large; lateral epigynal grooves shallow, pocket-like (Fig. 52). Internal genitalia; short, oblique copulatory ducts; spermathecae rounded; fertilization ducts short, directed outwardly (Fig. 53).

### Natural history

All specimens were collected at night or by beating trees.

### Distribution

Ecuador: known only from the type locality.

*Patrera hatunkiru* sp. nov.

[urn:lsid:zoobank.org:act:BBFE839E-6F46-4934-8ED0-D30BD4886F96](https://zoobank.org/act:BBFE839E-6F46-4934-8ED0-D30BD4886F96)

Figs 54–59

### Diagnosis

Males are easily distinguished from all species in the genus by their short and strongly curved median apophysis (Fig. 55). Females are diagnosed by the lateral epigynal grooves producing very deep cavities (Fig. 58).

## **Etymology**

The specific name is a noun in apposition is taken from the Kichwa language meaning ‘large teeth’.

## **Type material**

### **Holotype**

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, 00.41994° S, 79.00623° W, night collecting, 1997 m, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).

### **Other material examined**

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, night collecting, 1 ♂, 1 ♀, beating trees, 1 ♀, sifting moss, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♀, hand collecting, 24 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 1 ♀, beating trees, 00.41564° S, 79.00425° W, 2105 m, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ); 1 ♀, night collecting, 00.42261° S, 79.5107° W, 2225 m, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, 1 ♀, moss, Berlese, 13–15 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

## **Description**

### **Male (holotype)**

MEASUREMENTS. Total length: 6.4; carapace length: 2.5 carapace width: 2.2; abdomen length: 3.9.

CEPHALOTHORAX. Carapace yellow-orange with two wide dusky bands (Fig. 54). Fovea dark. Sternum light yellow, margin slightly darker. Labium and endites orange-brown.

CHELICERAE. Chelicerae light orange-brown. Large projection antero-apically; posterior side with large tooth, rounded and wide; promargin with 4, retromargin with 6 teeth (Fig. 57).

LEGS. Femora light yellow, tip with orange band, tibiae and metatarsi light yellow with a basal and apical orange band, tarsi light yellow-orange. Total length: I: 20.9; II: 18.2; III: 10.5; IV: 14.7; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 5.3/1.4/6.1/5.6/2.5; leg II 4.8/1.2/5.1/5.0/2.1; leg III 2.8/0.9/2.5/3.2/1.1; leg IV 3.8/1.2/3.5/4.8/1.4.

LEGS SPINATION. Tibia I d0-1-0; metatarsus I v2-1-0. Tibia II d0-1-0; metatarsus II v2-1-0. Tibia III d1-0-1, v2-2-0; metatarsus III d0-1-0, v2-2-0. Tibia IV d1-0-1, v2-2-2; metatarsus IV d0-1-0, v2-2-0. Tarsal claws unipectinate; retrolateral claws I–IV with 5–6 teeth, prolateral claws I–II with 11–13 teeth, prolateral claws III–IV with 7–9 teeth.

ABDOMEN. Oval. Dorsally yellowish with faint lateral dark dusky bands (Fig. 54).

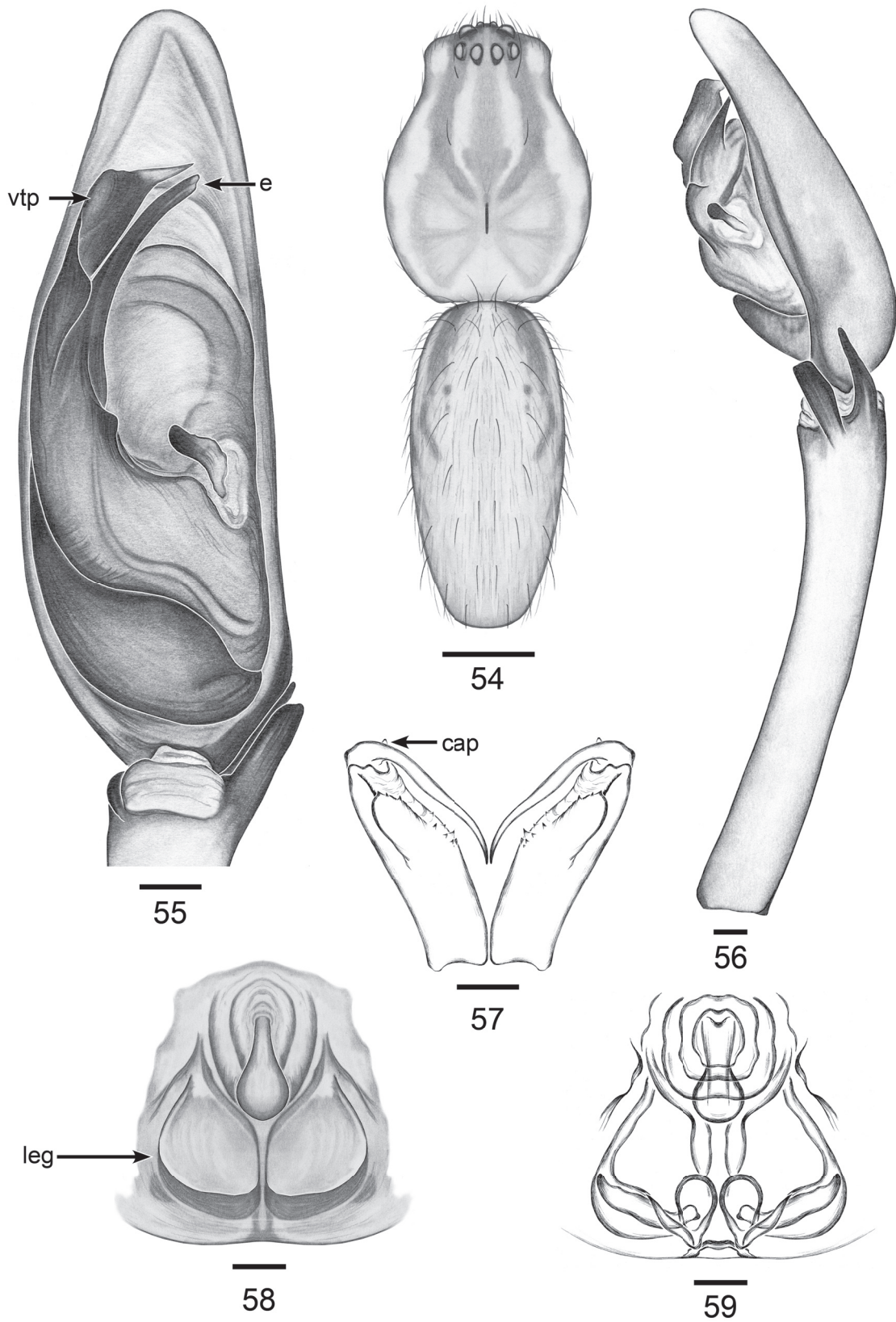
GENITALIA. Palpal patella without apophysis. Palpal tibia longer than cymbium (Fig. 56); anterior part of retrolateral tibial apophysis plate-like, posterior part thin and triangular (Fig. 56). Subtegulum rounded apically; tegulum compress; ventral projection of subtegulum well sclerotized, wide and pointed apically; median apophysis very short, curved; embolus wider basally, laminar, slightly curving (Fig. 55).

### **Female**

MEASUREMENTS. Total length: 7.1; carapace length: 2.5; carapace width: 2.1; abdomen length: 4.6.

CEPHALOTHORAX AND ABDOMEN. As in male.

CHELICERAE. Cheliceral promargin with 3, retromargin with 6 teeth.



**Figs 54–59.** *Patrera hatunkiru* sp. nov. **54.** ♂, habitus, dorsal view. **55.** ♂, palp, ventral view. **56.** ♂, palp, retrolateral view. **57.** ♂, chelicerae, posterior view. **58.** ♀, epigynum, ventral view. **59.** ♀, internal genitalia, dorsal view. Scale bars: 55–56, 58–59 = 0.1 mm; 54 = 1 mm; 57 = 0.5 mm.

LEGS. As in male. Total length: I: 15.0; II: 13.3; III: 8.7; IV: 12.0; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 4.1/1.2/4.2/3.8/1.7; leg II 3.8/1.1/3.8/3.1/1.5; leg III 2.5/0.9/1.9/2.5/0.9; leg IV 3.2/1.0/2.8/3.7/1.3.

LEGS SPINATION. Femur I p1-1-1, r1-1-1; tibia I v2-2-0; metatarsus I v2-2-0. Femur II p1-1-1, r1-1-1; tibia II v2-2-0; metatarsus II v2-2-0. Femur III p0-1-1, r0-1-1; tibia III d0-1-1, v2-2-0; metatarsus III d1-0-1, v2-2-0. Femur IV p0-1-1, r0-0-1; tibia IV d0-1-1, v2-2-2; metatarsus IV d0-0-1, v2-2-0. Tarsal claws unipectinate; retrolateral claws I–IV with 5–6 teeth, prolateral claws I–II with 12–13 teeth, prolateral claws III–IV with 8–9 teeth. Palpal claws with 4 teeth.

GENITALIA. Epigynum with oval, elongated median protuberance; atrium large; lateral epigynal grooves deep, pocket-like (Fig. 58). Internal genitalia; copulatory ducts long and curved; spermathecae oval; fertilization ducts long, directed outwardly (Fig. 59).

### Natural history

Most specimens were collected at night or by beating trees.

### Distribution

Ecuador: known only from the type locality.

*Patrera suni* sp. nov.

[urn:lsid:zoobank.org:act:CF570980-5B68-48EB-ABE4-3E0D06B1EA81](http://urn:lsid:zoobank.org:act:CF570980-5B68-48EB-ABE4-3E0D06B1EA81)

Figs 60–64

### Diagnosis

Males are easily distinguished from all species in the genus by their strongly curved ventral projection of subtegulum and embolus (Fig. 60). Females are distinguished by their blunt knob-like projection and curved lateral epigynal grooves (Fig. 63).

### Etymology

The specific name is a noun in apposition taken from the Kichwa language meaning ‘elongated’ in reference to the elongated male palpal tibia.

### Type material

#### Holotype

ECUADOR: ♂, Cotopaxi Province, Otonga Biological Reserve, hand collecting, 1700 m, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (QCAZ).

#### Other material examined

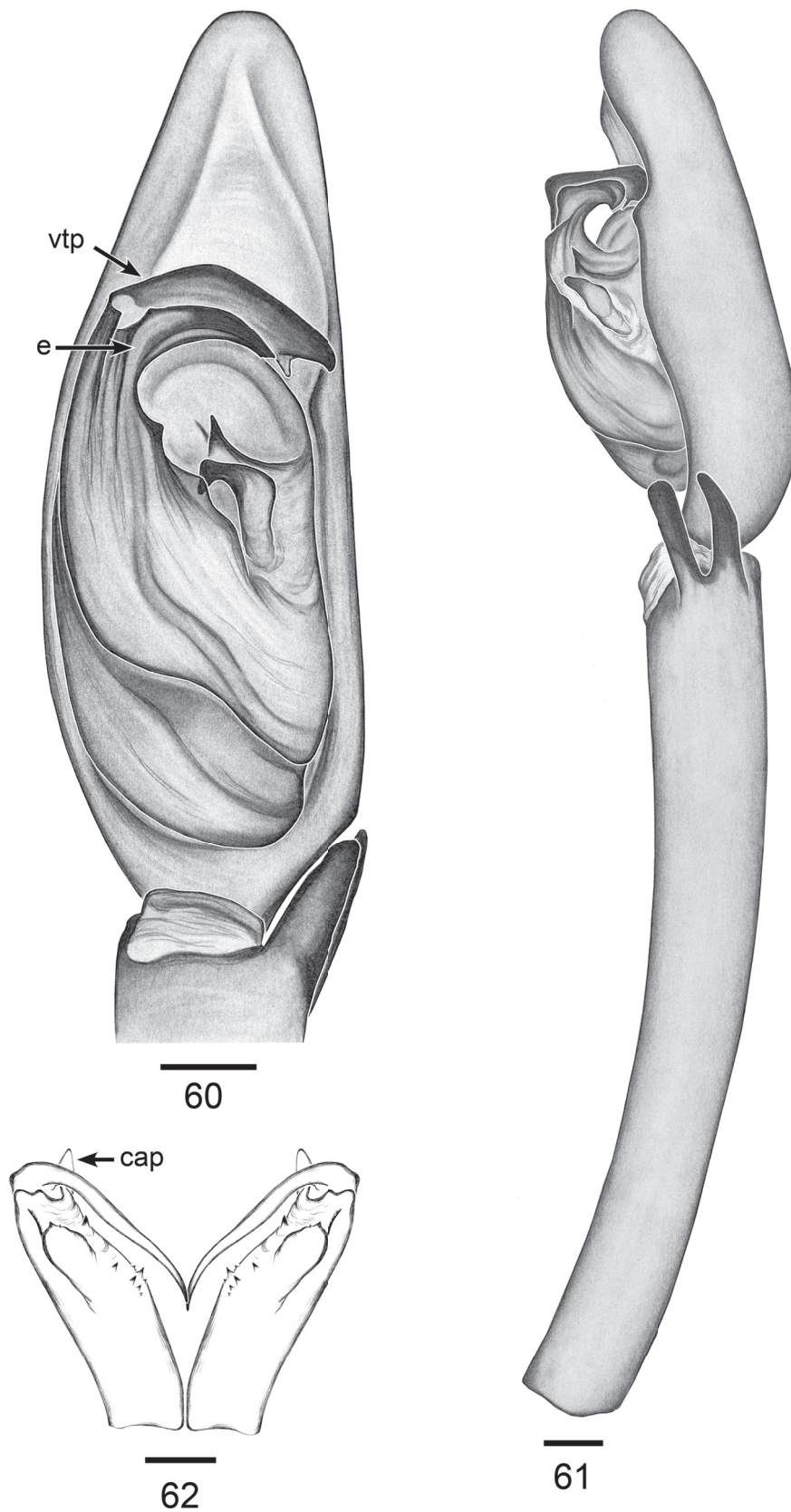
ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, Berlese, moss, 3 ♂♂, 1 ♀, night collecting, 13–15 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♂, beating, 00.66015° S, 78.66199° W, 1845 m, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♀, beating trees, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Description

#### Male (holotype)

MEASUREMENTS. Total length: 6.2; carapace length: 2.9 carapace width: 2.3; abdomen length: 3.3.





**Figs 60–62.** *Patrera suni* sp. nov. **60.** ♂, palp, ventral view. **61.** ♂, palp, retrolateral view. **62.** ♂, chelicerae, posterior view. Scale bars: 60–61 = 0.1 mm; 62 = 0.5 mm.

CEPHALOTHORAX. Pars cephalica light yellow dusky lines behind PLE; pars thoracica light yellow. Fovea dark. Sternum light yellow, margin slightly darker. Labium and endites yellow.

CHELICERAE. Orange-brown. Large projection antero-apically; posterior side with one large tooth, rounded and wide; promargin with 4, retromargin with 5 teeth (Fig. 62).

LEGS. Femora yellow with orange medial band, tibiae with basal, medial and apical orange band, metatarsi and tarsi light yellow-orange. Total length: I: 22.4; II: 19.5; III: 11.0; IV: 16.0; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 5.6/1.5/6.6/5.8/2.9; leg II 5.0/1.4/5.5/5.2/2.4; leg III 3.2/1.0/2.6/3.0/1.2; leg IV 4.2/1.2/3.9/5.2/1.5.

LEGS SPINATION. Metatarsus I v2-2-0. Metatarsus II v2-2-0. Tibia III d0-1-1, v2-2-1; metatarsus III d0-1-1, v2-2-1. Tibia IV d0-0-1, v2-2-2; metatarsus IV d0-1-1, v2-2-2. Tarsal claws unipectinate; retrolateral claws I–IV with 6–7 teeth, prolateral claws I–II with 13–15 teeth, prolateral claws III–IV with 9 teeth.

ABDOMEN. Oval. Dorsally yellowish with faint dusky lateral bands.

GENITALIA. Palpal patella without apophysis. Palpal tibia longer than cymbium (Fig. 61); anterior part of retrolateral tibial apophysis thin, plate-like, posterior part thin triangular (Fig. 61). Subtegulum rounded apically; tegulum compress; ventral projection of subtegulum well sclerotized, strongly curved; median apophysis very short, bent; embolus wider basally, laminar, short and curved (Fig 60).

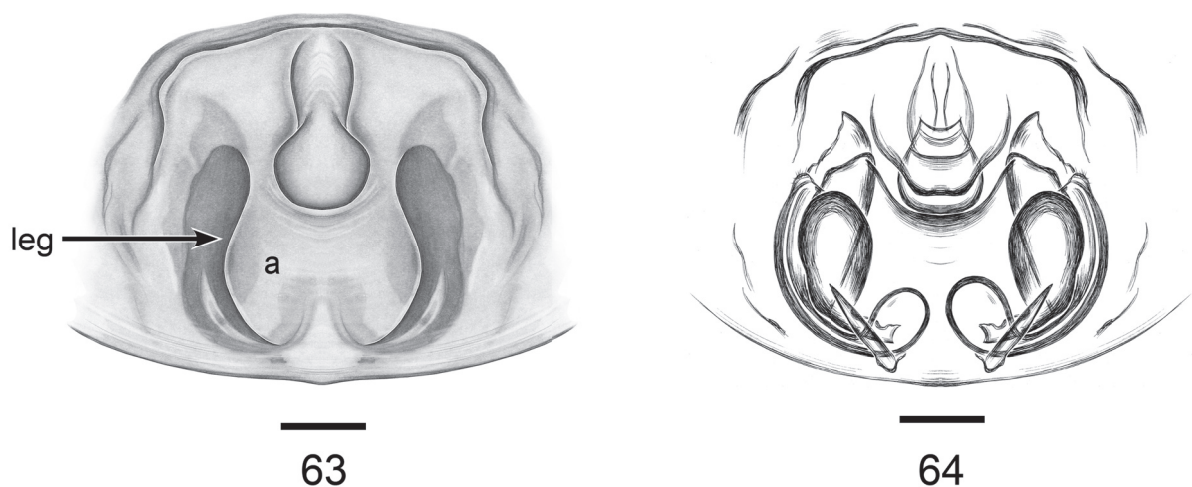
#### Female

MEASUREMENTS. Total length: 6.8; carapace length: 2.4; carapace width: 1.9; abdomen length: 4.4.

CEPHALOTHORAX AND ABDOMEN. As in male.

CHELICERAE. Cheliceral promargin with 3 teeth, retromargin with 7–8 teeth.

LEGS. As in male. Total length: I: 13.7; II: 12.1; III: 7.9; IV: 11.2; leg articles length (femur/patella/tibia/metatarsus/tarsus): leg I 3.8/1.2/3.8/3.2/1.7; leg II 3.3/1.0/3.5/2.8/1.5; leg III 2.2/0.8/1.9/2.2/0.9; leg IV 3.0/0.8/2.9/3.1/1.4. Tarsal claws not observed. Palpal claws with 4 teeth.



**Figs 63–64.** *Patrera suni* sp. nov. **63.** ♀, epigynum, ventral view. **64.** ♀, internal genitalia, dorsal view. Scale bars: 0.1 mm.

LEGS SPINATION. Femur I p0-1-1, r011-1; tibia I v2-2-0; metatarsus I v2-2-0. Femur II p0-1-1, r1-1-1; tibia II v2-2-0; metatarsus II v2-2-0. Femur III p0-1-1, r0-0-1; tibia III d0, v2-2-0; metatarsus III d0-0-1, v2-2-0. Femur IV p0-0-1, r0-0-1; tibia IV d0, v2-2-2; metatarsus IV d0-0-1, v2-2-0. GENITALIA. Epigynum with blunt, short, median knob; atrium large; lateral epigynal grooves curved, shallow pocket-like (Fig. 63). Internal genitalia; copulatory ducts long and curved; spermathecae oval; fertilization ducts long, directed outwardly (Fig. 64).

### Natural history

Specimens were collected in moss, by beating or hand collecting.

### Distribution

Ecuador: known only from the type locality.

### *Patrera fulvastra* Simon, 1903

### Material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, hand collecting, 24 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 9 ♂♂, 4 ♀♀, night collecting, 1 ♂, 3 ♀♀, beating trees, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (AMNH); 6 ♂♂, 4 ♀♀, night collecting, 1 ♂, 1 ♀, beating, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 5 ♂♂, 7 ♀♀, night collecting, 00.41994° S, 79.00623° W, 1997 m, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 4 ♂♂, 1 ♀, general collecting, 5–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 4 ♂♂, 1 ♀, beating, 00.42261° S, 79.5107° W, 2225 m, 12 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♀, hand collecting in grass, 1 ♂, 2 ♀♀, night collecting, 12 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 3 ♂♂, 6 ♀♀, night collecting, 13 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 4 ♀♀, beating, 00.66015° S, 78.66199° W, 1845 m, 13 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC). — Las Damas: 1 ♀, pitfall, 00.39506° S, 78.98100° W, 1209 m, 28 Jun.–12 Jul. 2014, 1 ♀, pitfall, 23 Jul.–5 Aug. 2014, E. Tapia, C. Tapia and N. Dupérré (DTC).

### Natural history

Most specimens were collected at night or by beating.

### Distribution

Colombia and Ecuador.

### Unknown 1

### Material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, moss from trees at 0.5–3 m high, 1 ♂, 1 ♀, beating, -00.42261° S, -79.5107° W, 2225 m, 15 Oct. 2014 and 12 Dec. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Natural history

Specimens were collected from moss in trees and by beating.

### Unknown 2

### Material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, night collecting, 00.41941° S, 78.99607° W, 1717 m, 24 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

**Natural history**

The only specimen known was collected at night.

Unknown 3

**Material examined**

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, night collecting, 13–15 Dec. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

**Natural history**

The only specimen known was collected at night.

Unknown 4

**Material examined**

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♀, hand collecting in moss, 24 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC); 1 ♀, sifting moss, 08–21 Jun. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC). — Las Damas: 1 ♀, pitfall, 00.39506° S, 78.98100° W, 1209 m, 12–23 Jul. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

**Natural history**

Specimens were collected in moss or in a pitfall trap.

Unknown 5

**Material examined**

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♀, sifting moss, 4–7 Sep. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

**Natural history**

The only specimen known was collected sifting moss.

Unknown 6

**Material examined**

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♀, beating trees, 24–30 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

**Natural history**

The only specimen known was collected beating trees.

Unknown 7

**Material examined**

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♀, moss in trees 0.5–3m high, 24 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Natural history

The only specimen known was collected from moss in trees.

Unknown 8

### Material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♀, night collecting, 13 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Natural history

The only specimen known was collected at night.

Unknown 9

### Material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 1 ♂, hand collecting, 2 Nov. 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Natural history

The only specimen known was collected at night.

**Amaurobioidinae** Hickman, 1949

*Josa nigrifrons* Simon, 1897

### Material examined

ECUADOR: Cotopaxi Province, Otonga Biological Reserve: 2 ♂♂, 2 ♀♀, sweeping grass, 1 ♂, beating trees, 24 May 2014, E. Tapia, C. Tapia and N. Dupérré leg. (DTC).

### Natural history

Specimens were collected by sweeping grass or beating trees.

## Discussion

The new genus proposed, *Shuyushka* gen. nov., somatically resembles *Wulfilopsis* and *Katissa*, based on the following characters; tracheal spiracle in the middle of the abdomen, lateral margin of the endites concave and posterior eye row procurved. Members of this new genus, however, are distinguished from *Wulfilopsis* by their sub-rectangular carapace (Fig. 27), oval in *Wulfilopsis* (Brescovit 1997: fig. 33) and differentiated from *Katissa* by their very distinctive male and female genitalic configuration (see diagnosis above). Furthermore, this new genus is distinguished from all other Anyphaeninae by the presence of a patch of short setae on the prolateral apex of tibia I (Fig. 40).

The genus *Katissa* was previously known from 5 species (World Spider Catalog 2016), but only the males of the type species have ever been described. In this paper, we have doubled the number of species and described 5 males, thus presenting a more accurate description of male and female genitalia as well as the dissimilarity between the different species within the genus. For example, we were able to observe that the male palpal tibia can either be shorter (Fig. 8) or longer (Fig. 13) than the cymbium. The embolus length is also variable, from short (Fig. 7) to long (Fig. 1) and it seems correlated to the length of the female copulatory ducts. *Katissa* species also display very interesting morphological and ecological specialisations. For instance, the discovery of the first dionychan spider with an elongated,

modified abdomen is quite remarkable. We hypothesize that this modification resembles a caterpillar, based on its general appearance (whitish, with small constrictions and setae, tip bent and appearing as a caterpillar head) and also on the fact that in the moss extraction where *Katissa kurusiki* sp. nov. was found, we also noticed very small and whitish caterpillars. As far as we know, this condition was never described before in spiders. The caterpillar-like abdomen was found in all male specimens of *K. kurusiki* sp. nov, but the extension of the abdomen varies quite a bit in size from a nub to a very long tail, although the end of the tail is always curved and pointed. The modification of the abdomen into an elongated worm-like extension has been recorded before and it was hypothesised that it may be movable and perhaps camouflaging the spider as an inchworm (Exline & Levi 1962). Modification, elongation of abdomen in spiders to mimic a worm and/or caterpillar has been reported in various families such as Araneidae (e.g., *Arachnura feredayi* (L. Koch, 1872), *A. scorpionoides* Vinson, 1863) (Uyemura 1976), Tetragnathidae (e.g., *Tetragnatha anguilla* Thorell, 1877) (Keyserling 1887) and Theridiidae (e.g., *Ariames longissimus* Keyserling, 1891, *Neospintharus trigonum* Hentz, 1850) (Exline & Levi 1962). This is the first finding of such an adaptation in the family Anyphaenidae. Interestingly, *Katissa* specimens were collected mostly from moss hanging from trees and by beating trees, which clearly shows that they are arboreal. Two species (*K. kurusiki* sp. nov. and *K. puyu* sp. nov.) show a pattern of colouration that camouflages well within moss and were almost exclusively collected in moss from trees.

*Shuyushka* gen. nov. is composed of three species. Specimens were collected beating trees and in moss hanging from trees, they also have a distinctive colour pattern with arrow markings on the dorsal surface of the abdomen (Fig. 27) and patterned legs that could function as camouflage in moss and trees.

The five new species described in the genus *Patrera* are somewhat unusual, in the sense that the male and female genitalia do not conform with the genitalia of the type species, *Patrera fulvastra*. That being said, they might represent a group of Andean *Patrera* (Brescovit pers. comm.) or a new genus altogether, but until complete revisions of the genus *Patrera* and other related genera become available, it is prudent to maintain them in this genus. *Patrera* specimens were mainly collected by beating trees and by night collecting. *Patrera* species have a very faint pattern (Fig. 54), which seems adapted to their habitat, tree foliage. Males of *Patrera* have very well developed chelicerae, sometimes with a very large tooth (Fig. 57), and the male's legs I–II are extremely long, two to three times the length of the body. Females also have legs I–II longer than the others, but not as exceptionally long as in the male. This could be a predatory adaptation for hunting and running, as they are known to be cursorial hunting spiders (Jocqué & Dippenaar-Schoeman 2006). An interesting morphological characteristic of *Patrera*, is that both males and females have uneven numbers of teeth on the tarsal claws of legs I–IV; the prolateral tarsal claw always have more teeth than the retrolateral one.

There are few spider biodiversity studies in neotropical premontane, low evergreen and cloud forest. A few spider biodiversity assessments have been done in cloud forests, namely in Mexico (Maya-Morales *et al.* 2012) and Costa Rica (Yanoviak *et al.* 2003; Peckmezian 2009), but never in Ecuador. In their study of a tropical montane cloud forest of Mexico, Maya-Morales *et al.* (2012) collected 1208 adult spiders, representing 112 morphospecies and 22 families. Yanoviak *et al.* (2003) and Peckmezian (2009), in their study of Costa Rican cloud forest, reported collecting 298 adult spider specimens, representing 86 morphospecies, while Peckmezian collected 406 adult spiders, representing 73 morphospecies and 15 families. Our biodiversity study is, by far, the most exhaustive spider biodiversity assessment ever done in premontane, low evergreen and cloud forest of the Chocó region of Ecuador. A total of 5482 adult spiders was collected, representing 248 morphospecies distributed over 37 families. The most diverse family collected was the Theridiidae family (32 morphospecies), making up ~13% of the total spider diversity collected. The most diverse families were: the Oonopidae (23 morphospecies), Tetragnathidae (22 morphospecies), Linyphiidae (22 morphospecies), Anyphaenidae (19 morphospecies) and Salticidae

(15 morphospecies) each representing ~10% of the fauna. All the remaining families ranged between 1 and 5%. Anyphaenidae was the fifth most diverse family found in the Chocó forests of Ecuador. Abundance wise, the family Oonopidae was the most abundant (27%), followed by the Zodariidae (14%) and the remaining families counted for less than 10% of the total abundance. If we only look at the abundance of arboreal spiders collected, then the family Theridiidae is the most abundant one (23%), followed by the Anyphaenidae (14%), Araneidae (13%) and Tetragnathidae (12%), which makes the Anyphaenidae the second most abundant family found in the arboreal habitat. Compared to similar studies, Maya-Morales *et al.* (2012) showed that in the understory of remnant tropical montane forests of Mexico, the four most abundant families were the Theridiidae, Anyphaenidae, Tetragnathidae and Linyphiidae. Yanoviak *et al.* (2003) showed that in the canopy and understory of the Costa Rican cloud forest, Araneidae and Linyphiidae were the most commonly collected families at all locations. And, finally, Peckmezian (2009) showed that in the low primary forest, 41.9% of the spiders collected belong to the family Ctenidae, while 35.3% were from the family Linyphiidae in the high primary forest. A comparison between different ecological studies is difficult, due to the use of different methodologies and collecting techniques. Most studies focus on a particular habitat (canopy, forest understory or ground) or use only a few techniques. In our study we collected spiders from all habitats, except the canopy, using five different collecting techniques. Consequently, this is the most thorough biodiversity spider study in the neotropical forests of the Chocó region of Ecuador. Our results demonstrate for the first time the importance of the family Oonopidae in neotropical forests, a family hardly ever mentioned in other studies. Finally, we were able to demonstrate that the family Anyphaenidae is a major component in the overall spider diversity found in these types of forests. The forests from the Chocó region of Ecuador harbour a wealth of biodiversity, hardly ever studied. Much more work needs to be done in order to understand these complex habitats. Nevertheless, this study is the first to uncover the unknown spider diversity hidden in these endangered forests and hopefully a stepping stone for further studies.

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