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A NEW SPECIES OF *SPINOSATIBIAPALPUS* GABRIEL & SHERWOOD, 2020 FROM PERU (ARANEAE: THERAPHOSIDAE)

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Abstract: A new species of the genus *Spinosatibiapalpus* Gabriel & Sherwood, 2020 is described from Peru, *Spinosatibiapalpus bora* **sp. nov.**, based on the palpal bulb morphology of a male specimen from Pebas.
Key words: Araneae, Theraphosidae, taxonomy, morphology, new species, museums, Peru.

Una especie nueva de *Spinosatibiapalpus* Gabriel & Sherwood, 2020 de Perú (Araneae: Theraphosidae)
Resumen: Se describe una especie nueva del género *Spinosatibiapalpus* Gabriel & Sherwood, 2020 de Perú, *Spinosatibiapalpus bora* **sp. nov.**, en base a la morfología del bulbo palpal de un macho adulto de Pebas.
Palabras clave: Araneae, Theraphosidae, taxonomía, morfología, especie nueva, museos, Perú.

Taxonomy / Taxonomía: *Spinosatibiapalpus bora* **sp. nov.**

Introduction

The genus *Spinosatibiapalpus* Gabriel & Sherwood, 2020 was established by Gabriel & Sherwood (2020) to house some species previously housed in the genus *Pseudhapalopus* Strand, 1907, namely *Spinosatibiapalpus spinulopalpus* (Schmidt & Weinmann, 1997) from Colombia, *Spinosatibiapalpus tansleyi* Gabriel & Sherwood, 2020 from Trinidad (though there is a possibility the label data may not refer to the well-known island, see Gabriel & Sherwood, 2020) and *Spinosatibiapalpus trinitatis* (Pocock, 1903) from Trinidad. The genus is defined based on palpal bulb morphology and the presence of a large amount of spines on the prolateral palpal tibia (Gabriel & Sherwood, 2020) and is, at present, only known from the aforementioned countries (World Spider Catalog, 2021).

In this work, we describe a new species of the genus *Spinosatibiapalpus* based on the unique palpal bulb morphology of a specimen from Pebas, Peru which was discovered by the authors in the collections of the Muséum National d'Histoire Naturelle, Paris during a visit in December 2019. Simultaneously, we thus provide the first confirmed record of the genus from Peru.

Material and methods

Specimens were examined under binocular microscopes, photographs were using a Leica M125C auto-montage with images stacked using Helicon Focus software. Description style follows Sherwood *et al*. (2020). Abbreviations; Institutes: BMNH = Natural History Museum, London, United Kingdom; MNHN = Muséum National d'Histoire Naturelle, Paris, France; OUMNH = Oxford University Museum of Natural History, Oxford, United Kingdom; SMF = Senckenberg Forschungsinstitut und Naturmuseum, Frankfurt am Main, Germany; ZMB = Museum für Naturkunde, Berlin, Germany. Structures: ALE = anterior lateral eyes, AME = anterior median eyes, GP = guard plates (of spermathecae *sensu* Gabriel & Sherwood, 2020), PLE = posterior lateral eyes, PME = posterior median eyes; PB = prolateral branch (of tibial apophysis); RB = retrolateral branch (of tibial apophysis); TH = tegular heel (of palpal bulb). Other: imm. = immature; det. = determined; coll. = collector; colln. = collection. Abbreviations for museum collections follows Evenhuis (2007). Leg spine terminology follows Petrunkevitch (1925) with the modifications proposed by Bertani (2001): d = dorsal, v = ventral, r = retrolateral, p = prolateral. Palpal bulb keel terminology follows Bertani (2000) and Gabriel (2016): A = apical, PI = prolateral inferior, PS = prolateral superior, RS = retrolateral superior (= R in Bertani, 2000); RI = retrolateral inferior; SA = subapical, with the additions proposed by Gabriel & Sherwood (2020): PC = prolateral crease; PAR = prolateral apical ridge. The anterior and posterior halves of the PC are respectively defined from: (1) from the base of the PC to the approximate middle of the PC, and (2) from the approximate middle of the PC to the end of the PC. Leg formula starts with the longest leg to the shortest in order of decreasing size, e.g. 4,1,2,3. Urticating setae terminology follows Cooke, Roth & Miller (1972). All measurements in mm. The map was made using SimpleMappr (Shorthouse, 2010). Authors' emphases in [ ].

OTHER TYPE MATERIAL EXAMINED: Holotype ♂, paratype ♀ *Pseudhapalopus spinulopalpus* SMF 39018, Colombia, Boavita, Camilo leg. 25 May 1972; holotype ♂ *Spinosatibiapalpus tansleyi* BMNH 1905.8.25.11–12, west-central Trinidad; holotype ♂ *Metriopelma trinitatis* BMNH 1901.8.1.7, Trinidad, coll. W. Ince; holotype ♂ *Crypsidromus trinitatis pauciaculeis* SMF 2669, Mittel-Südamerika, Trinidad und Tobago, Trinidad, Gerold leg. 1888, E. Strand det.; holotype ♂ *Paraphysa pulcherrimaklaasi* SMF 37585, Mittel-Südamerika, Ecuador, A. Tinter leg., G. Schmidt det.; holotype ♂, paratype imm. ♂ *Metriopelma velox* BMNH 1898.15.12–13, February 1897, W. R., Paramba, Ecuador; holotype ♂ *Cymbiapophysa yimana* BMNH 05.10.40, Peru or Ecuador, coll. P. O. Simmons; holotype ♂ *Crypsidromus tetricus* MNHN AR–4651, Caracas; holotype ♂, paratype ♂ *Miaschistopus rapidus* West Coast Africa, BMNH 90.7.1.336, Keyserling colln.

OTHER NON-TYPE MATERIAL EXAMINED: 4♂♂, 1 [sex indeterminable] *Spinosatibiapalpus trinitatis* BMNH 1933.12. 20.1–6 (part), Trinidad B.W.I. August– September 1926, coll J. S. Dunkerley; 1♂, 2♀♀ *Cymbiapophysa velox* BMNH 03.7.1.125– 127, Pambelor, N.W. Ecuador; 1 imm ♂ *Miaschistopus tetricus* BMNH 90.3.16.8, Mombassa, coll. H. Grose Smith, det. Gabriel and Sherwood, 14 April 2017; 4♂♂ *Miaschtophus tetricus* BMNH 90.3.19.12–15, Caracas, coll. Dr Ernst; 1 ♂ *Miaschistopus tetricus* OUMNH, Pickard-Cambridge colln. *Miaschtophus tetricus* det. R. Gabriel 29 April 2013; 1♂ *Miaschistopus tetricus* ZMB 30788, Caracas coll. S. Gollmer, det. Rudloff, Feb 1996, *Miaschtophus tetricus* det. R. Gabriel 29 April 2013.

Results

Spinosatibiapalpus Gabriel & Sherwood, 2020

Spinosatibiapalpus Gabriel & Sherwood, 2020: 307.

DIAGNOSIS: (modified from Gabriel & Sherwood, 2020) *Spinosatibiapalpus* can be distinguished from other theraphosine genera by the heavily spinose male prolateral palpal tibia, along with the morphology of the male palpal bulb with PAR present, and PI running almost a third or almost half the length on the embolus. Females can be distinguished from other theraphosine genera with twin spermathecae by the morphology the short, squat, retrolaterally bowed receptacles, emerging medially from ovate GP, higher than their width, with almost the length of a single GP at their apical separation.

DESCRIPTION: Small to large theraphosine spiders (~20–60mm body length). Carapace ovate, hirsute, caput slightly raised, ocular tubercle raised, with anterior eye row procurved, posterior eye row recurved and ocular arrangement ALE > AME > PLE > PME. Clypeus narrow with fringe of medial or long length setae. Fovea deep, transverse or recurved. Labium wider than long, with between 18–60 cuspules. Labio-sternal mounds joined. Maxillae longer than wide, hirsute, each with 40–100 cuspules distributed basally on approximately half of the maxilla, absence of stridulatory setae or lyra on prolateral faces. Sternum ovate, marginally longer than wide, with three pairs of ovate sigilla present, at varying distances from the edge of the sternum. Legs and palps all of approximate equal thickness (except femora III of males), hirsute, generally spinose, striping apparent on dorsal faces of patellae, tibiae and metatarsi of legs I–IV, and patellae, tibiae and tarsi of pedipalps. One pair of tarsal claws on tarsi I– IV. Ventral faces of tarsi I–II fully scopulate or divided by line or band of setae, tarsi III–IV divided by line or band of setae. Metatarsi I–IV all with ventral scopulae, of varying extents. Coxal spinules absent. Coxa of leg I lacking stridulatory setae. Trochanter of leg I lacking stridulatory setae. Femur IV without pad of plumose stridulatory scopulae on prolateral face. Palpal trochanter lacking stridulatory setae. Lateral median spinnerets typical, one-segmented, unmodified. Posterior lateral spinnerets typical, tri-segmented, unmodified. Femur III slightly incrassate or incrassate in males, unmodified in females. Opisthosoma without patterning, covered in long setae, with Type I urticating setae present dorsally. Male tibia I lacking apophysis (*S. bora* **sp. nov.**, *S. tansleyi* and *S. trinitatis*) or with single-branched apophysis (*S. spinulopalpus*), male metatarsus I unmodified, male palpal tibia with retrolateral apophysis, numerous spines present prolaterally on basal third of palpal tibia, palpal cymbium unmodified. Male palpal bulb with TH; PS, PI, A, SA and RS weakly developed or developed, RI absent, PI keel running almost a third or almost half the length of the embolus, PAR present and raised, almost obscuring the PC, PI weakly developed (*S. spinulopalpus*, *S. tansleyi* and *S. trinitatis*) or developed (*S. bora* **sp. nov.**), PS longer than PI (*S. tansleyi*) or PI longer than PS (*S. trinitatis* and *S. spinulopalpus*) or PS and PI of approximately equal length (*S. bora* **sp. nov.**). Female spermathecae with short, squat, retrolaterally-bowed receptacles, emerging medially from ovate GP.

DISTRIBUTION: Colombia, Peru and Trinidad (Fig. 13).

SPECIES INCLUDED: *S. bora* **sp. nov.**, *S. spinulopalpus*, *S. tansleyi*, *S. trinitatis*

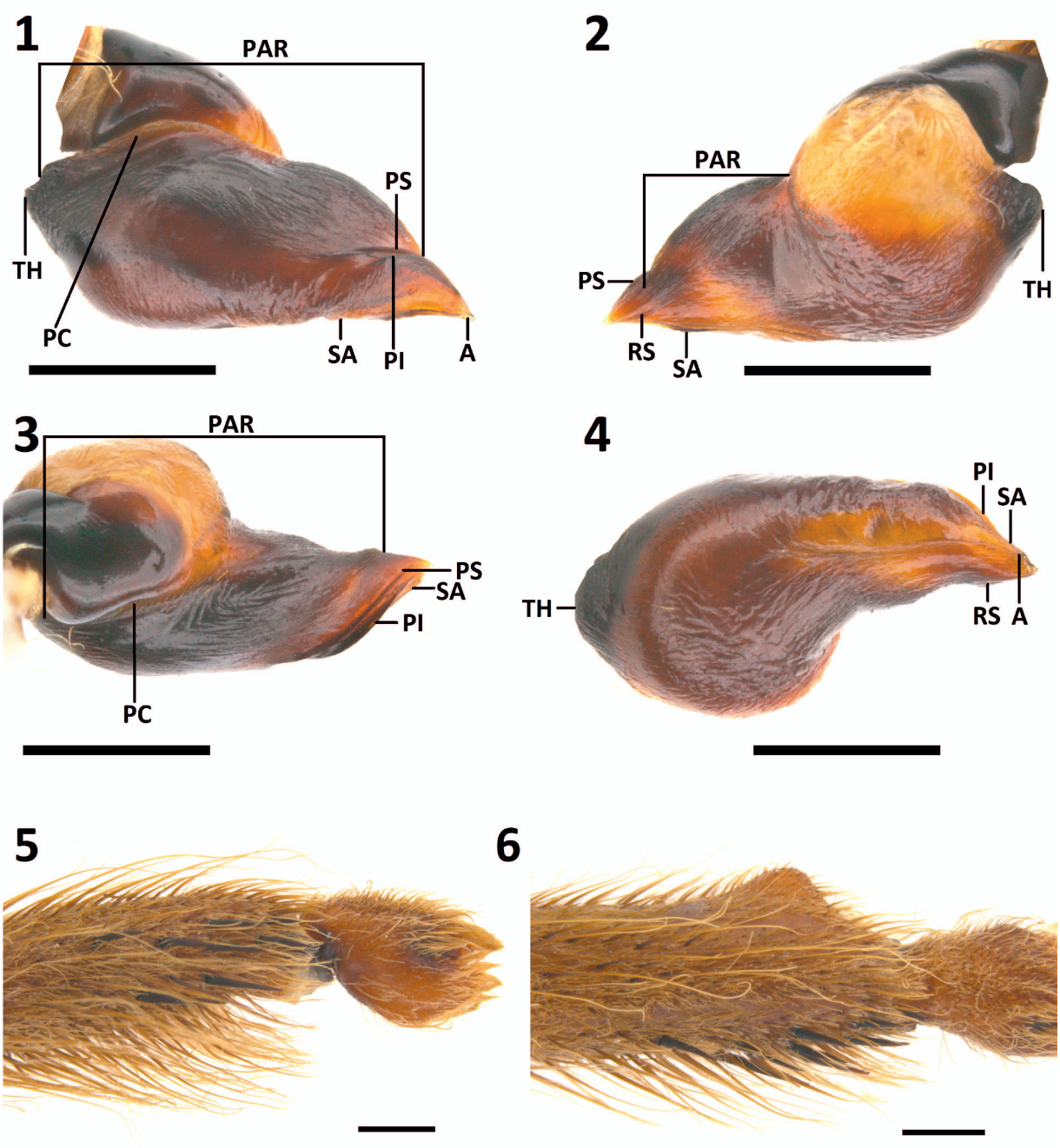
Spinosatibiapalpus bora sp. nov.

TYPE MATERIAL: Holotype ♂ MNHN AR-4654, Pebas [= Pebas, Pebas District], [coll.] Math, 6217 [E. Simon collection number], examined.

DIAGNOSIS: *S. bora* **sp. nov.** can be differentiated from all known congeners by male palpal bulb morphology with a developed PI (weakly developed in all known congeners), the comparatively more distinct PAR (less distinct in known congeners) and by the PS and PI being of approximately equal length (PI longer than PS in *S. trinitatis* and *S. spinulopalpus*, PS longer than PI in *S. tansleyi*). Additionally distinguished from congeners by the reduced number of spines on the palpal tibia (8 vs. >20 in known congeners). Further distinguished from *S. spinulopalpus* by the absence of tibial apophyses (present in *S. spinulopalpus*) and from *S. tansleyi* by the weakly developed PI (PI developed in *S. tansleyi*).

ETYMOLOGY: The species epithet is a noun in apposition honouring the indigenous Bora people who live in the Amazonian lowlands, including Pebas.

DESCRIPTION: Holotype male (MNHN AR-4654): Total length including chelicerae: 27.4. Carapace: length 11.1, width 9.7; caput slightly raised; ocular tubercle slightly raised, length 1.3, width 2.0. Eyes: ALE < AME, AME > PLE, PLE > PME, anterior eye row procurved, posterior row slightly recurved. Clypeus: narrow; clypeal fringe: long. Fovea: deep, transverse. Chelicera: length 5.3, width 2.6. Abdomen: length 11.0, width 7.2. Maxilla with 40–50 cuspules covering approximately 40% of the proximal edge. Labium: length 1.7 width 2.0, with 20–30 cuspules mostly separated by 0.5–1.0 × the width of a cuspule. Labio-sternal mounds: joined. Sternum: length 5.0, width 4.9, with three pairs of sigilla. Tarsi I–IV densely scopulate and undivided. Metatarsal scopulae: I 40%; II 24%; III 20%; IV ascopulate. Lengths of legs and palpal segments: see Table I, leg formula 4,1,2,3. Spination: tibia I v 0–2–2 (apical), II v 0–2–2 (apical), III v 0–0–2 (apical), IV v 0–0–2 (apical), palp p 0–0–8 (Fig. 5), metatarsus I v 2–3–4 (3 apical), II v 0–2–3 (apical), III v 0–4–3 (apical), IV v 3–4–5 (3 apical). Tibia I: unmodified, tibial apophysis absent. Femur III: incrassate. Palpal tibia: with prominent triangular-shaped retrolateral apophysis (Fig. 6). Palpal cymbium: unmodified. Metatarsus I: straight, unmodified. Posterior lateral spinnerets with three segments, basal 2.0, median 1.3, digitiform apical 1.9. Lateral median spinnerets with one segment. Palpal bulb with TH; PS, PI and SA developed, A and RS weakly developed, RI absent, PS and PI of approximately equal length, PI running almost



Figs. 1–6: *Spinosatibiapalpus bora* **sp. nov.**, holotype male (MNHN AR–4654), palpal bulb (left hand side), **1** prolateral view, **2** retrolateral view, **3** dorsal view, **4** ventral view. Scale lines = 1mm. **5–6:** Palpal tibia and cymbium (left hand side), **5** prolateral view, **6** dorsal view. Scale lines = 1mm.

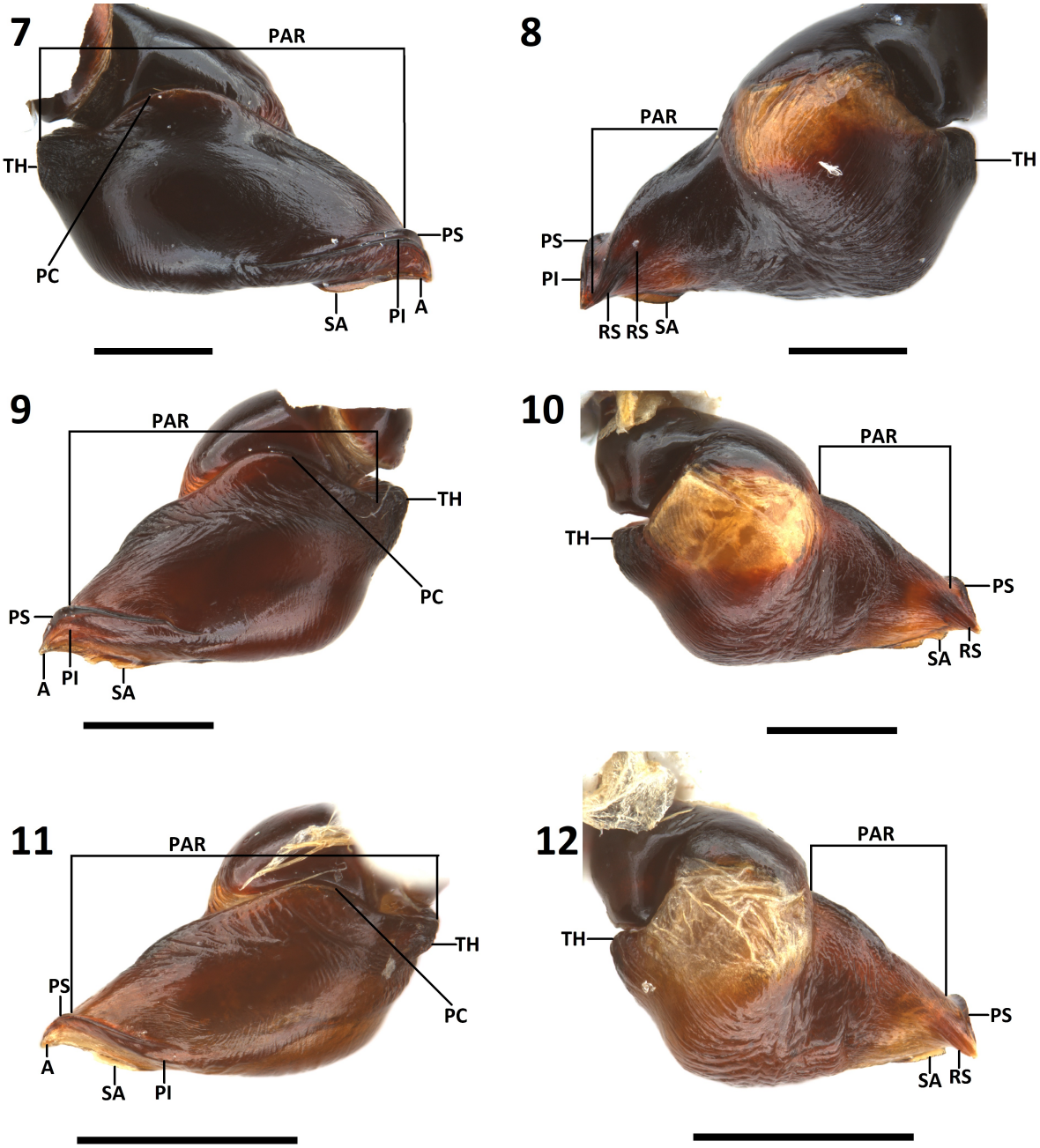
half the length of the embolus, PAR present and distinct, PC wide, slightly constricted in posterior half. (Figs. 1–4, see also Table II). Stridulation organ: absent. Urticating setae: Type I present. Colour: Alcohol preserved brown.

DISTRIBUTION: Known only from the type locality, Pebas, Peru (Fig. 13)

REMARKS: *Spinosatibiapalpus* is now demonstrably distributed in three countries: Colombia, Peru and Trinidad. The distribution pattern, which at first glance could appear disjunct, is similar to that of the schismatotheline genus *Neoholothele* Guadanucci & Weinmann, 2015 which is distributed in Colombia, Trinidad and Venezuela (Guadanucci &Weinmann, 2015). It is possible other theraphosid genera known from one of these countries may be present in one or more of the others, and this should be investigated by future workers. Yet another example are the schismatotheline genera *Euthycaelus* Simon, 1889 and *Schismatothele* Karsch, 1879 which have a distribution from Western Colombia to Easternmost Venezuela, with areas of the former overlapping

Table I. *Spinosatibiapalpus bora* **sp. nov.**, holotype male (MNHN AR–4654), podomere lengths.

	I	II	III	IV	Palp
Femur	13.1	11.4	10.7	13.2	6.7
Patella	5.5	5.1	4.5	4.7	3.8
Tibia	12.4	11.0	8.8	12.5	5.9
Metatarsus	11.0	11.5	12.1	16.0	–
Tarsus	5.8	5.8	5.8	6.1	2.4
Total	47.8	44.8	41.9	52.5	18.8



Figs. 7–12: 7–8 *Spinosatibiapalpus spinulopalpus* holotype male (SMF 39018), palpal bulb morphology, plate adapted from Gabriel & Sherwood (2020) with corrections (see discussion, in Remarks), **7** prolateral view, **8** retrolateral view. **9–10** *Spinosatibiapalpus tansleyi* holotype male (BMNH 1905.8.25.11–12), palpal bulb morphology, plate adapted from Gabriel & Sherwood (2020), **9** prolateral view, **10** retrolateral view. **11–12** *Spinosatibiapalpus trinitatis* holotype male (BMNH 1901.8.1.7), palpal bulb morphology, plate adapted from Gabriel & Sherwood (2020) with corrections (see discussion, in Remarks), **11** prolateral view, **12** retrolateral view. Scale lines = 1mm.

Table II. Bulb keel morphology of *Spinosatibiapalpus bora* **sp. nov.**, holotype male (MNHN AR–4654) in comparison to known congeners. Table format follows Bertani (2000) with modifications based on the new palpal bulb features detailed by Gabriel & Sherwood (2020). Homologous keels present: weakly developed (+), developed (++), well developed (+++), or absent (–).

Taxon	PS	PI	A	SA	RS	RI	Additional Comments
Spinosatibiapalpus bora **sp. nov.**	+	++	+	++	+	–	PS and PI of approximately equal length, PC wide, slightly constricted in posterior half, ER and PR absent, PAR present and distinct.
Spinosatibiapalpus spinulopalpus (Schmidt & Weinmann, 1997)	+	+	+	++	+	–	PI longer than PS, PC narrow and constricted in anterior half, ER and PR absent, PAR present and distinct.
Spinosatibiapalpus tansleyi Gabriel & Sherwood, 2020	++	+	+	++	+	–	PS longer than PI, PC narrow and of uniform width, ER and PR absent, PAR present and distinct.
Spinosatibiapalpus trinitatis (Pocock, 1903)	+	+	+	++	+	–	PI longer than PS, PC narrow and of uniform width, ER and PR absent, PAR present and distinct.

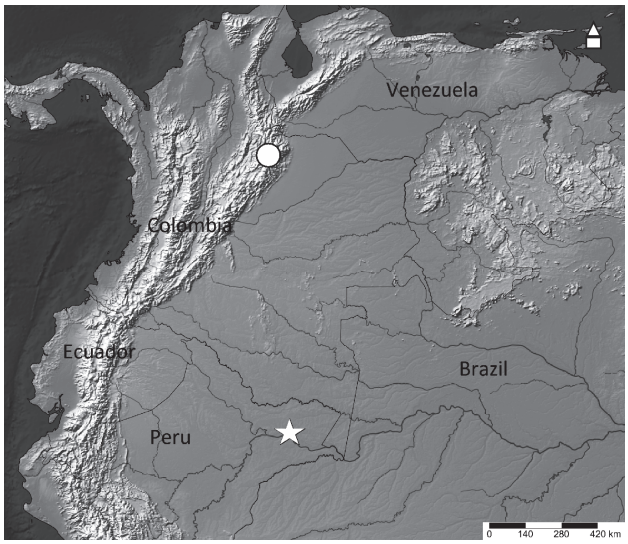


Fig. 13: Distribution map showing the type localities of *Spinosatibiapalpus bora* **sp. nov.** (star) and *Spinosatibiapalpus spinulopalpus* (Schmidt & Weinmann, 1997) (circle). The symbols for *Spinosatibiapalpus tansleyi* Gabriel & Sherwood, 2020 (square) and *Spinosatibiapalpus trinitatis* (Pocock, 1903) (triangle) are general distribution indicators and not precise localities, see discussion in Gabriel & Sherwood (2020).

with areas where *Spinosatibiapalpus* species are known to occur (Guadanucci & Weinmann, 2014; Valencia-Cuéllar *et al*., 2019). It is highly likely that more new species of *Spinosatibiapalpus* will be found by future workers if they are able to sample areas between the currently known localities.

Comparative plates showing the palpal bulb morphology of the three prior known *Spinosatibiapalpus* species (including some corrections, see the text below) are presented here to allow easier comparison of the palpal bulb morphology of these taxa with the new species described in this work (Figs. 7–12). In Gabriel & Sherwood (2020) *Spinosatibiapalpus* is defined as lacking an RI keel, which is correct, but there is a small error on the plate of the palpal bulb of *S. spinulopalpus*, where part of the RS is partially mislabelled as a RI in two figures (Gabriel & Sherwood, 2020: 308, f. 17, 19). In this species, there is a slight curvature to the RS which is why we wanted to label it at two different points during its course to the apex of the embolus, but the latter half was accidentally mistyped as "RI" and the error not spotted until after publication. Here, we confirm a RI is absent in this species. Another error in the plates is that the RS is mislabelled as an A in one figure of *S. trinitatis* (Gabriel & Sherwood, 2020: 312, f. 36). Both of these errors are corrected in the comparative bulb images of these species presented in this work.

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