

A diminutive new species of *Acanthopelma* from Belize (Araneae: Theraphosidae)

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Summary

A new species of *Acanthopelma* (Araneae: Theraphosidae) from northern Belize is described, and is among the smallest theraphosid spiders known. The new taxon is distinguished from congeners by an incrassate palpal tibia, preapical embolar process and unmodified tibial spur in males, and a unique abdominal pattern in females. Both sexes possess unusually short medial segments of the posterior lateral spinnerets. Data on meristic and morphometric character variation and natural history notes are also presented.

Introduction

The theraphosid genus *Acanthopelma* O. P.-Cambridge, 1897 was established for the species *Acanthopelma rufescens*, known from a single male collected in Guatemala. Initially described as a theraphosine, *A. rufescens* was placed in the subfamily Ischnocolinae based on the presence of a dividing band of setae on the tarsal scopulae (Gerschman & Schiapelli, 1973), a character shared by a large number of Old and New World genera (Perez-Miles, 1994). Raven (1985) noted the contrast between the stiff, spiniform bristles on the tarsal scopulae of *Acanthopelma* and the soft, Type B (Rovner, 1978) setae characteristic of most ischnocolines, and maintained the genus within the Theraphosinae. Smith (1995), augmenting Raven's observation with additional characters including a clavate apex of the outer tibial spur and an unmodified palpal embolus, proposed the separation of the three known *Acanthopelma* species: *A. rufescens*, *A. maculatum* Banks, 1906 from the Bahamas, and *A. beccarii* di Caporiacco, 1947 from French Guiana into the new subfamily Acanthopelminae, which he invalidly attributed to Raven (1985). A series of specimens representing a fourth species of *Acanthopelma*, discovered in the dry tropical forest of northern Belize and described herein, provides the first opportunity to present data on meristic and morphometric variation for this little-known genus.

All measurements are in mm and were made using a stereomicroscope fitted with an eyepiece micrometer, ± 0.01 mm. Leg and pedipalp measurements were taken from the left side. All leg segment measurements were taken ventrally. Spination abbreviations follow Prentice (1992), and are as follows: a=apical, b=basal, d=dorsal, e=preapical, m=medial, p=prolateral direction, r=retrolateral direction, v=ventral, 0.33, 0.50, etc.=approximate fraction of the total segment length a spine is from the proximal end. Standard abbreviations are used for ocular descriptions. Coloration was

recorded from living specimens under full spectrum light using colour charts in the Pantone Book of Color (Eisman & Herbert, 1990).

Acanthopelma annae, new species (Figs. 1–8)

Types: Holotype ♂, from 0.5 km W of New River Lagoon, Indian Church Village, Orange Walk District, Belize, 9 January 1995, leg. S.B. Reichling. Paratypes, same locality: 1♀, 9 January 1995; 7♀, 10 January 1995; 2♀, 29 May 1995; 6♂, 30 September 1995; all leg. S.B. Reichling. All specimens deposited in the Natural History Museum, London (NHM).

Etymology: The specific epithet is a patronym in honour of the author's wife, Ann, in recognition of her partnership in arachnological investigation.

Diagnosis: *Acanthopelma annae* males are distinguished from all known congeners by having palpal tibiae which are markedly incrassate, and a sharp, preapical process on the palpal embolus. Females are diagnosed by a unique abdominal pattern of five pairs of dorsal crescents. Both sexes possess unusually short medial segments of the posterior spinnerets, <0.65 the length of the basal segment. With a maximum legspan of 49.2, *A. annae* is one of the smallest theraphosids yet described. *Acanthopelma annae* is superficially similar to *A. rufescens*, from which it can further be distinguished by males having unmodified tibial spurs, as opposed to the clavate outer spur of *A. rufescens*.

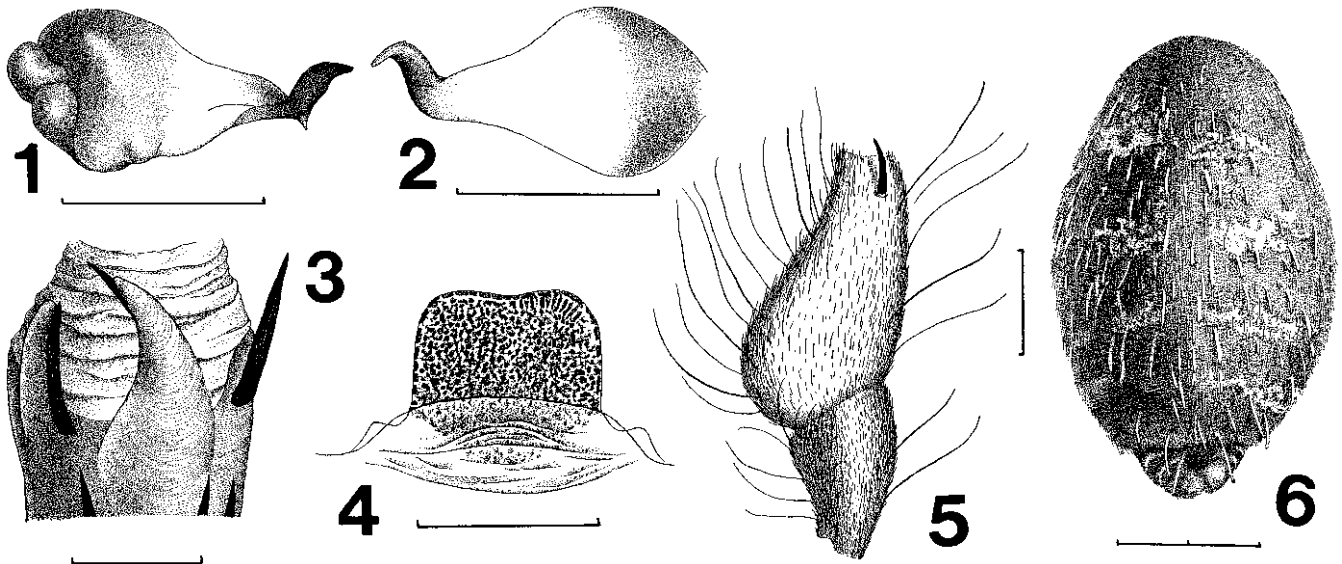
Male holotype: Length 14.7. Carapace length 6.1, width 4.7, carapace width/length 0.77; chelicerae, width 2.2; macroteeth 8/9; sternum width 2.4, length 2.9; sigilla at base of coxae II and III, posterior pair largest. Labial cuspules, 60; maxillary cuspules, 115/92. Anterior lobe of maxilla distinct and produced. Leg span, measured from apex of left tarsus I to apex of right tarsus IV, 46.3. Leg and palp segment lengths in Table 1.

Carapace clothed in raven black (Pantone 19-0000) pubescence with copper (Pantone 16-1325) margins, closely appressed. Sternum entirely raven black. Abdomen: mid-dorsal surface covered with immaculate copper pubescence; laterally with faint traces of four black smudges on each side; ventrally clothed in immaculate copper pubescence. Microscopic examination of abdominal scrapings indicates that *A. annae* lacks urticating hairs. Coxae and trochanters clothed in copper pubescence, other segments raven black with

Leg	I	II	III	IV	Palp
Coxa	2.8	2.0	1.9	2.1	0.5
Trochanter	0.9	0.8	0.3	0.4	0.3
Femur	5.0	4.1	3.9	5.4	2.2
Patella	1.7	1.5	1.1	1.2	1.0
Tibia	4.4	3.6	3.0	5.1	2.5
Metatarsus	3.1	2.9	3.0	4.3	—
Tarsus	2.8	2.4	2.5	3.3	0.6
Total	20.7	17.3	15.7	21.8	7.1

Table 1: Leg and palp measurements of *Acanthopelma annae*, new species, holotype male.

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Figs. 1–6: *Acanthopelma annae*, new species. **1** Male holotype, left palpal organ, prolateral view; **2** Ditto, retrolateral view; **3** Male holotype, left tibial spurs, ventral view; **4** Female paratype, epigyne, dorsal view; **5** Male holotype, right palpal tibia, prolateral view, showing ventral incrustation; **6** Female paratype, abdomen, dorsal view, showing pattern. Scale lines=0.5 mm (3), 1.0 mm (1-2, 4-5), 2.0 mm (6).

scattered longer black setae. Ventral surface of legs entirely raven black.

Fovea transverse. Anterior eye row recurved; AME round, diameter 0.17, separated by 0.15; ALE nearly round, diameter 0.21. Posterior eye row procurved; PME ovoid, 0.15×0.14 ; PLE oval, 0.20×0.12 , separated by 0.46. Caput length 1.9, width 1.4, length/width 1.4. Clypeus absent. Tibia I with bipartite spur; short upper process, length 0.5, with one basal megaspine connected along retrolateral surface; longer lower process, length 0.8, curved prolaterally and tapering to a sharp point, with one subapical megaspine (Fig. 3). All tarsi fully scopulate, longitudinally divided by a line of stiff spines, width of band and spine density increasing from tarsi I-IV (as female, Fig. 7). Tarsal trichobothria clavate over distal 1/2-2/3 and filiform basally (as female, Fig. 8). Two tarsal claws, lacking teeth, present on all legs. Tibiae III moderately incrassate. Extent of metatarsal scopulae: I, 0.68; II, 0.62; III, 0.53; IV, 0.51. Palpal tibia ventrally incrassate (Fig. 5), length/maximum width 1.7. Posterior lateral spinneret segment lengths: basal, 1.0; medial, 0.4; apical, 0.4. Palpal bulb length 1.6, greatest width 0.8; middle division broad, tapering gradually toward distal end; apical division slender, bent abruptly downward near apex; embolar apex retrolaterally twisted and somewhat flattened,

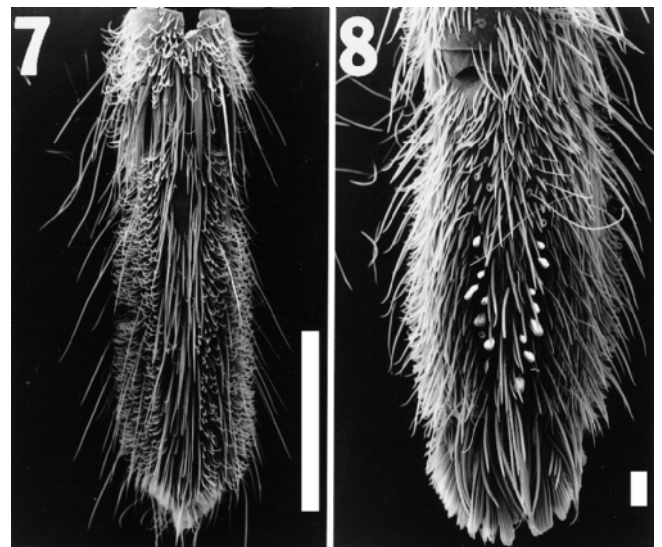
with a sharp process emerging preapically and twisted prolaterally (Figs. 1,2).

Spination: leg I, femur 1d(re), tibia 6v(2p0.18 2me 1ep 1pa), metatarsus 2v(1p0.31 1ma); leg II, femur 1d(re), tibia 2d(1r0.28 1r0.56) 6v(3mb 1m0.36 2ma), metatarsus 2v(1p0.24 1pa); leg III, tibia 1d(r0.17) 9v(3mb 1m0.37 2m0.40 1ma 2pa), metatarsus 3d(1m0.37 1r0.37 1m0.50) 7v(1m0.20 1p0.20 1m0.47 1p0.47 2ma 1pa); leg IV, tibia 8v(2mb 1pb 1p0.31 1m0.45 3ma), metatarsus 2d(1m0.58 1me) 11v(1m0.16 1p0.16 1p0.30 1m0.58 1p0.58 1m0.63 3ma 1ra 1pa).

Female paratype (same date as holotype): Length 16.6. Carapace length 5.4, width 4.3, carapace width/length 0.80; chelicerae, width 2.8; macroteeth 9/10; sternum width 2.4, length 2.9; sigilla at base of coxae II and III,

Leg	I	II	III	IV	Palp
Coxa	2.6	2.0	2.0	2.3	2.1
Trochanter	1.1	0.4	0.9	1.0	0.7
Femur	3.1	3.2	3.8	3.6	2.4
Patella	1.4	1.1	0.8	1.1	0.9
Tibia	3.0	2.7	2.3	3.8	1.9
Metatarsus	2.0	1.7	1.8	2.7	—
Tarsus	2.1	1.9	1.5	2.2	2.2
Total	15.3	13.0	13.1	16.7	10.2

Table 2: Leg and palp measurements of *Acanthopelma annae*, new species, paratype female (same date as holotype).



Figs. 7–8: *Acanthopelma annae*, new species, female paratype. **7** Left tarsus IV, ventral view, showing broad band of spines dividing scopula; **8** Left tarsus I, dorsal view, showing distribution of clavate trichobothria. Scale lines=1.0 mm (7), 0.1 mm (8).

Leg	I	II	III	IV	Palp
Coxa	2.7–3.0 (2.9 ± 0.1)	2.0–2.7 (2.4 ± 0.2)	1.8–2.2 (1.9 ± 0.1)	2.1–2.5 (2.4 ± 0.1)	0.5–2.3 (1.8 ± 0.6)
Trochanter	0.6–1.5 (1.1 ± 0.3)	0.7–1.2 (1.0 ± 0.2)	0.3–1.0 (0.8 ± 0.2)	0.4–1.3 (0.9 ± 0.3)	0.3–1.0 (0.9 ± 0.2)
Femur	4.7–5.4 (5.1 ± 0.2)	4.1–5.2 (4.6 ± 0.4)	3.7–4.4 (4.0 ± 0.2)	5.0–6.1 (5.6 ± 0.4)	2.2–3.2 (2.8 ± 0.4)
Patella	1.0–2.2 (1.7 ± 0.4)	1.4–1.6 (1.5 ± 0.1)	0.8–1.4 (1.0 ± 0.2)	1.2–1.7 (1.5 ± 0.2)	0.9–1.2 (1.1 ± 0.1)
Tibia	4.2–4.9 (4.7 ± 0.3)	3.6–4.3 (3.9 ± 0.2)	2.8–3.2 (3.0 ± 0.1)	5.1–5.5 (5.3 ± 0.1)	2.0–3.0 (2.6 ± 0.4)
Metatarsus	3.0–3.5 (3.2 ± 0.2)	2.9–3.3 (3.1 ± 0.2)	2.9–3.4 (3.1 ± 0.2)	3.4–4.9 (4.4 ± 0.5)	—
Tarsus	2.8–3.2 (3.0 ± 0.1)	2.4–2.9 (2.7 ± 0.2)	2.5–2.8 (2.7 ± 0.1)	3.0–3.7 (3.3 ± 0.2)	0.6–1.2 (1.0 ± 0.2)

Table 3: *Acanthopelma annae*, new species. Seven males including holotype; range (mean ± SD) of leg and palp measurements.

posterior pair largest. Labial cuspules, 76; maxillary cuspules, 107/97. Anterior lobe of maxilla distinct and moderately produced. Leg span 36.0. Leg and palp segment lengths in Table 2.

Carapace partridge brown (Pantone 18-1124) with pale gold (Pantone 15-0927) pubescence. Sternum partridge brown. Abdomen: dorsal surface marked with double series of five irregular, gold earth (Pantone 15-1234) spots, nearly meeting at mid-dorsum, on pinecone brown (Pantone 19-1121) background with sparsely scattered long, gold earth setae (Fig. 6); ventrally immaculate bran brown (Pantone 17-1336). Coxae and trochanters partridge brown with pale gold pubescence, remainder of legs clay brown (Pantone 15-1231) with scattered long clay brown setae. Ventral surface of legs entirely partridge brown.

Fovea recurved. Anterior eye row recurved; AME round, diameter 0.18, separated by 0.15; ALE oval, 0.23 × 0.16. Posterior eye row procurved; PME oval, 0.23 × 0.14; PLE oval, 0.23 × 0.14, separated by 0.70. Caput length 0.99, width 0.78, length/width 1.3. Clypeus absent. All tarsi fully scopulate, divided by spines as in holotype. Clavate trichobothria and tarsal claws as in holotype. Neither tibiae III nor palpal tibiae incrassate. Extent of metatarsal scopulae: I, 0.70; II, 0.60; III, 0.60; IV, 0.52. Posterior lateral spinneret segment lengths:

basal, 1.0; medial, 0.6; apical, 0.8. Spermathecae fused (Fig. 4), width 1.1, length 0.7.

Spination: leg I, metatarsus 2v(1m0.07 1ma), leg II, metatarsus 2v(1m0.05 1me); leg III, tibia 1d(m0.35) 3v(1m0.06 2me), metatarsus 5d(1m0.04 1m0.06 1r0.06 2ma) 6v(1m0.03 1m0.05 1m0.09 3ma); leg IV, tibia 2d(1r0.02 1r0.06) 1v(ra), metatarsus 4d(1m0.06 1m0.11 2ma) 8v(1p0.03 1r0.04 1p0.06 1r0.10 1m0.12 3ma); palp, tibia 5v(1p0.04 1p0.07 3ma).

Variation: Males (n=7): Length 14.4–17.7 (15.9 ± 1.2), carapace length 5.9–6.8 (6.3 ± 0.3), width 4.5–5.0 (4.7 ± 0.2). Macroteeth per fang furrow 8–11 (9 ± 1). Legspan 45.8–49.2 (47.7 ± 1.5). Variation in leg and palp segment lengths in Table 3. Medial segment of posterior lateral spinneret shorter than basal segment in all specimens, medial segment length/basal segment length 0.40–0.60 (0.51 ± 0.1). Palpal tibia length/maximum width 1.6–2.1 (1.8 ± 0.2). No variation in palpal embolus morphology.

Females (n=10): Length 14.8–20.9 (16.7 ± 1.9), carapace length 4.5–7.3 (6.0 ± 0.8), width 2.9–5.0 (4.3 ± 0.6). Macroteeth per fang furrow 9–12 (10 ± 1). Legspan 29.7–41.9 (36.7 ± 3.7). Variation in leg and palp segment lengths in Table 4. Medial segment of posterior lateral spinneret shorter than basal segment in all specimens, medial segment length/basal segment length

Leg	I	II	III	IV	Palp
Coxa	2.0–3.3 (2.6 ± 0.4)	1.5–2.6 (2.1 ± 0.3)	1.4–2.4 (2.0 ± 0.3)	1.7–2.8 (2.3 ± 0.4)	0.9–2.9 (1.8 ± 0.4)
Trochanter	0.5–1.3 (1.0 ± 0.2)	0.4–1.3 (0.8 ± 0.3)	0.4–1.0 (0.8 ± 0.2)	0.5–1.1 (0.9 ± 0.2)	0.4–1.1 (0.7 ± 0.2)
Femur	3.0–4.3 (3.8 ± 0.4)	2.7–3.9 (3.4 ± 0.4)	2.6–3.8 (3.0 ± 0.4)	2.3–4.3 (3.4 ± 0.6)	2.2–3.2 (2.5 ± 0.3)
Patella	1.0–1.9 (1.6 ± 0.2)	0.9–1.4 (1.1 ± 0.2)	0.6–1.0 (0.8 ± 0.1)	0.9–1.5 (1.2 ± 0.2)	0.6–1.0 (0.8 ± 0.2)
Tibia	1.4–3.7 (2.8 ± 0.6)	1.6–2.8 (2.4 ± 0.4)	1.7–2.3 (2.0 ± 0.2)	2.3–3.9 (3.3 ± 0.5)	1.6–2.1 (1.9 ± 0.2)
Metatarsus	1.0–2.9 (1.8 ± 0.5)	1.1–1.9 (1.6 ± 0.2)	1.3–2.0 (1.6 ± 0.2)	2.0–2.9 (2.4 ± 0.3)	—
Tarsus	1.5–2.1 (1.9 ± 0.2)	1.5–2.3 (1.9 ± 0.2)	1.5–2.1 (1.9 ± 0.2)	1.7–2.9 (2.2 ± 0.4)	1.7–2.3 (2.0 ± 0.2)

Table 4: *Acanthopelma annae*, new species. Ten female paratypes; range (mean ± SD) of leg and palp measurements.

0.33–0.60 (0.49 ± 1.0). Pattern and coloration uniform within sample. No variation in spermathecae observed.

Distribution: Known only from the type locality. At present, *A. annae* is the only *Acanthopelma* species reported from Belize.

Natural history: The collecting site and surrounding area was predominantly dry tropical forest, interspersed with many small farms planted with corn, sugar cane, and plantain. The site extends westwards from the bank of the New River Lagoon, which is the only permanent body of water in the immediate vicinity.

Burrows were located in open, sunny clearings and foot trails. Burrows were doorless and heavily lined with silk, straight and shallow, 60–116 mm deep, with 8–9 mm diameter openings. Most burrows were in close proximity to several others, forming local aggregations of 2–6 burrows that were widely separated from other such clusters.

Acanthopelma annae appeared to be abundant at the type locality, where permanently open clearings were present. Efforts to locate burrows in shaded forest were unsuccessful, although the tiny openings would be difficult to see among the leaf litter.

Captive females collected gravid in the field oviposited in June, September, and October. The incubation period at 23°C was 35–37 days. One eggsac contained thirty-two eggs.

Other material examined: *Acanthopelma rufescens* O. P.- Guatemala: holotype male (NHM), collection date unknown.

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