

A NEW GENUS AND SPECIES OF THERAPHOSID SPIDER FROM BELIZE (ARANEAE, THERAPHOSIDAE)

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ABSTRACT. A monotypic theraphosid spider genus, *Crassicrus* new genus, and a new species *Crassicrus lamanai* new species, are described from the tropical dry forest of north-central Belize. Natural history and biogeographical notes are given.

The mygalomorph family Theraphosidae is a large and diverse group which is poorly known, particularly in Belize. Belizean material collected by E.C. Welling M. in 1984 and sent to the second author included six specimens that did not fit any known theraphosid genus. Examination of these specimens suggested that they represented a new genus within the theraphosid subfamily Theraphosinae, as they exhibited the large subtegulum diagnostic of that subfamily (Raven 1985). Mature males collected by the first author in 1995 confirmed the existence of a locally abundant and distinctive new genus of theraphosid spider, described below, from the dry tropical forest of northern Belize.

METHODS

All measurements are in mm and were made using a dial caliper, ± 0.01 mm. Leg and pedipalp measurements were made on the left side of all specimens. Trochanters and coxae were measured from their ventral aspect, while all other leg measurements were taken dorsally. Leg segment widths were measured dorsoventrally at the point of greatest width. The spermathecal illustration was based on stereomicroscopic examination of dissected spermathecae. Spination abbreviations follow Prentice (1992). Standard abbreviations are used for ocular descriptions. Coloration was recorded during examination of live specimens under sunlight using color charts from

the Pantone Book of Color (Eisman & Herbert 1990).

Crassicrus new genus

Type species.—*Crassicrus lamanai* new species.

Etymology.—From the Latin root *crass*, thick, and *crus*, shin, in reference to the incrassate tibia of leg IV.

Diagnosis.—*Crassicrus* possesses a more incrassate, barrel-shaped tibia IV than *Eupalaestrus* Pocock 1901, the only other New World theraphosid to exhibit this feature. This character state is present in both sexes but more pronounced in the female. *Crassicrus*, in contrast to *Eupalaestrus*, lacks a scopulated pad on the retrolateral surface of femur IV. Females are readily distinguished from all other theraphosids by a field of thorn-like setae on the entire ventral and ventro-prolateral surface of coxae and femora II-IV. Both sexes possess fine plumose hairs on the retrolateral surface of the palp trochanter and femur and the opposing prolateral surface of the leg I trochanter and femur.

Included species.—Only the type species.

Crassicrus lamanai new species

Figs. 1–9; Tables 1–4

Types.—Holotype male, paratype female from 0.5 km W New River Lagoon, Indian Church Village near Lamanai Forest Reserve, Orange Walk District, Belize, 6 January 1995 (S.B. Reichling). *Paratypes:* 7 January 1995,

1♂ (S.B. Reichling); 3 September 1995, 2♂ (S.B. Reichling). 9 January 1995, 4♀ (S.B. Reichling). Locality for all paratypes as above. All specimens deposited in the American Museum of Natural History, New York.

Etymology.—The specific epithet is a noun in apposition from the Mayan word *lama' anayin*. This was the name of their ancient trading center, still standing centuries later, but now called Lamanai.

Diagnosis.—The diagnostic generic characters of the monotypic *Crassicrus* also serve to distinguish the species *Crassicrus lamanai* new species. The morphology of the male palpal bulb is diagnostic in that the apex exhibits 5–6 prominent keels. The mature male is further distinguished from most other theraphosids by the swollen third tibia. In addition, female *C. lamanai*, when freshly molted, exhibit a distinctive anterior to posterior two-toned coloration.

Description.—*Male (holotype)*: Length 36.9. Carapace length 16.3, width 14.1, carapace width/length 0.86; chelicerae, width 5.6; right fang furrow, 12 macroteeth, left furrow damaged; sternum, width 6.1, sternum length 6.8; sigilla at base of coxae I, II, and III, posterior pair largest. Labial cuspules, 56, medial anterior face; maxillary cuspules, 199, 188, baso-prolateral surface. Leg span, measured from apex of left tarsus I to apex of left tarsus IV, 136.7. Femur III moderately incrassate, maximum width 3.5 (Fig. 1); femora I, II, and IV, 2.0, 1.9, and 2.7, respectively. Tibia IV slightly incrassate, maximum width 2.5 (Fig. 2); tibiae I, II, and III, 1.5, 1.8, and 1.5, respectively; maximum width tibia IV/maximum width femur IV 0.81. Leg and palp segment lengths in Table 1.

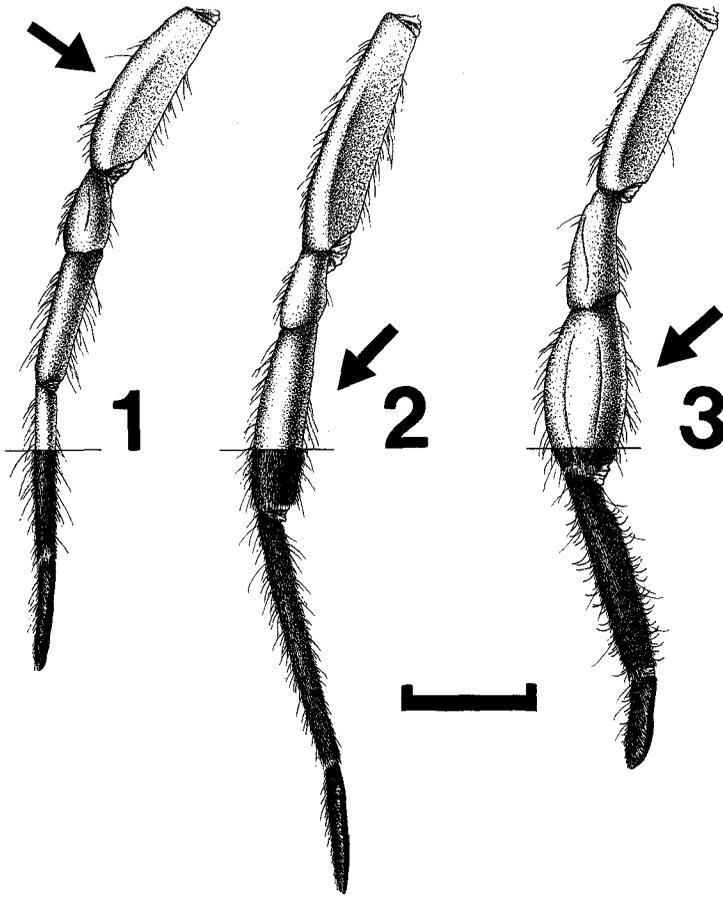
Entire spider shiny black with deep violet pubescence when viewed in strong light. Maxillary hairs dull orange. Carapace clothed in sparse covering of jet black (Pantone, 19–0303) hairs. Abdomen clothed in short, jet black hairs interspersed with longer jet black setae; pubescence dense over posterior half of abdomen dorsum, corresponding to circular patch of type I (Cooke et al. 1972) urticating hairs; pubescence over anterior half of abdomen sparse, with integument clearly visible. Legs hirsute and jet black; short pubescence with abundant long setae on all segments.

Carapace lacking pronounced bosses; caput not markedly elevated; fovea deep and weakly

procurved. Anterior eye row procurved; AME round, diameter 0.5, separated by 0.2; ALE ovoid, 0.3 × 0.4. Posterior eye row crescentic; PME ovoid, 0.1 × 0.2; PLE ovoid, 0.2 × 0.3, separated by 0.9. Clypeus very narrow. Tibia I with usual bipartite spur; shorter upper process with one preapical ventral megaspine; longer lower process strongly curved toward upper process, one subapical megaspine on surface facing upper spur (Fig. 4). Coxae without plumose setae; short, spiniform setae on anterior face of coxae I and II. Trochanters of femora I and II with fine plumose hairs on prolateral face. Long setae interspersed abundantly within short pubescence on all leg segments. Tarsal scopulation complete and entire. Metatarsal scopulation entire: I, complete; II, 0.67; III, 0.48; IV, 0.14. Basal portion of middle division of palpal bulb broad with concave ventral region angled abruptly downward, somewhat less than 90°, with six prominent keels spiraling to broadly truncated apex; single dorsal keel serrated (Figs. 5, 6). **Spination**: Leg I, metatarsus 1v(am), tibia 3v(2ap 1ar); leg II, metatarsus 1d(br) 3v(1am 1m0.71 1br), tibia 6v(2ap 1am 1m0.43 1m0.35 1bm); leg III, metatarsus 9v(3ap 1am 1ar 1er 1m0.30 1r0.30 1bm), tibia 2v(1m0.50 1bm), femur 1d(ep); leg IV, metatarsus 4d(1am 1ap 1ep 1p0.60) 5v(1am 1m0.70 1m0.45 1m0.21 1bm), tibia 2d(1am 1em) 2v(1am 1bm); palp, tibia 4v(2ap 1ep 1bp).

Female (paratype): Length 48.9. Carapace length 22.2, width 18.0, carapace width/carapace length 0.81; chelicerae, width 9.3; right fang furrow, 13 macroteeth, left furrow, 14 macroteeth; sternum, width 7.2, length 10.6; sigilla as in holotype. Labial cuspules, 82, medial anterior face; maxillary cuspules, 234, baso-prolateral surface. Leg span, 126.8. Tibia IV overtly incrassate, maximum width 5.3 (Fig. 3); tibiae I, II, and III, 3.2, 3.6, and 3.4, respectively; maximum width tibia IV/maximum width femur IV 1.22. Leg and palp segment lengths in Table 2.

Overall brown dorsally, with pronounced anterior to posterior difference in shade. Medium brown anteriorly (carapace, chelicerae, patellae, tibiae, metatarsi and tarsi I, II, and palp), distinctly darker shades posteriorly (abdomen, legs III and IV). Ventral aspect also distinctly bi-toned, leg IV and abdomen dark brown to black. Coloration in preservative uniform dark brown. Chelicerae clothed in

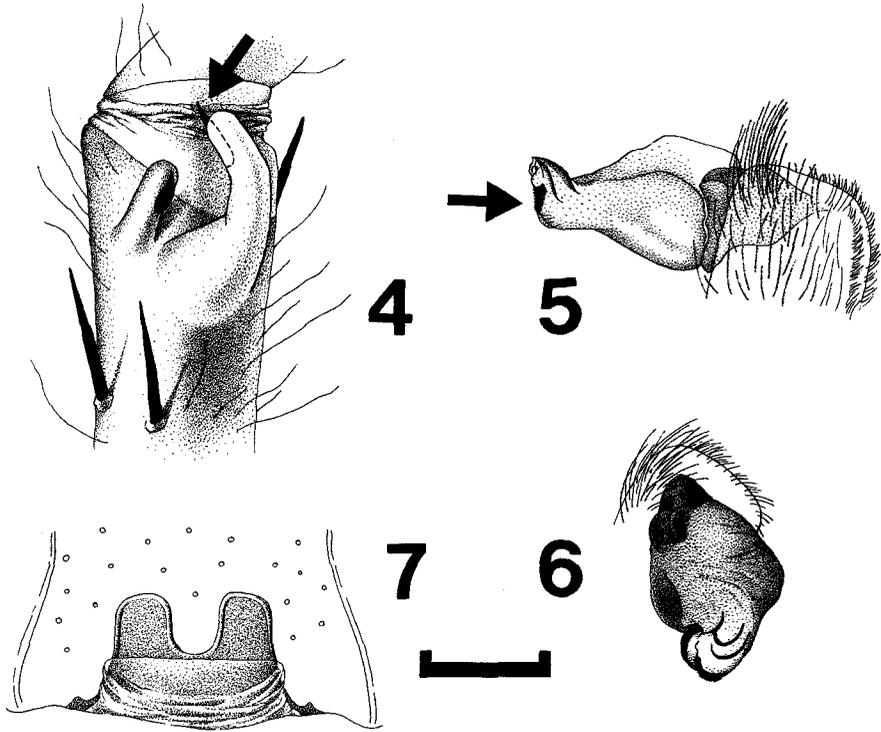


Figures 1-3.—*Crassicus lamanai* new genus and new species. 1, Male holotype, leg III, retrolateral view, showing moderately incrassate femur (arrow); 2, Male holotype, leg IV, retrolateral view, showing weakly incrassate tibia (arrow); 3, Female paratype, leg IV, retrolateral view, showing strongly incrassate tibia (arrow). All legs depicted with setae removed from proximal $\frac{3}{4}$ to highlight segment morphology. Scale line = 1 cm.

Table 1.—*Crassicus lamanai* new genus and new species. Male holotype; length of leg and pedipalp segments (mm).

Leg	I	II	III	IV	Palp
Coxa	7.3	7.3	6.0	6.0	4.0
Trochanter	2.1	2.4	2.0	2.7	1.2
Femur	15.3	14.6	12.3	16.0	8.9
Patella	8.1	7.0	6.0	6.7	5.5
Tibia	11.6	11.0	10.4	13.5	8.0
Metatarsus	12.2	12.0	13.1	18.3	—
Tarsus	8.5	7.9	7.0	8.6	3.4
Total length	65.1	62.2	56.8	71.8	31.0

tortoise-shell brown (Pantone, 19-1241) pubescence with longer setae of similar color but basal $\frac{1}{3}$ grading to black. Maxillary hairs dull orange. Carapace clothed in short, dense tortoise-shell brown pubescence, closely appressed. Abdomen with velvety, dense pubescence interspersed with long setae; dorsum bracken brown (Pantone, 19-1015) with persimmon orange (Pantone, 16-1356) setae; ventral pubescence and setae rich jet black; sharp basolateral division between dorsal and ventral coloration; urticating hair patch of type I hairs covering posterior half of abdomen dorsum with crescentic anterior margin. Coxae and trochanters of all legs except IV dark earth brown (Pantone, 19-1012). Femora I, II, III, and palpal femur distinctly darker



Figures 4-7.—*Crassicrus lamanai* new genus and new species. 4, Male holotype, left tibia I, prolateral view, showing spur processes and megaspine (arrow) location; 5, Male holotype, left palpal organ, prolateral view, showing position of serrated keel (arrow) and abruptly angled embolic region; 6, Male holotype, right palpal organ, frontal view, illustrating six spiraling apical keels; 7, Female paratype, spermathecae, dorsal view. Scale line = 2 mm.

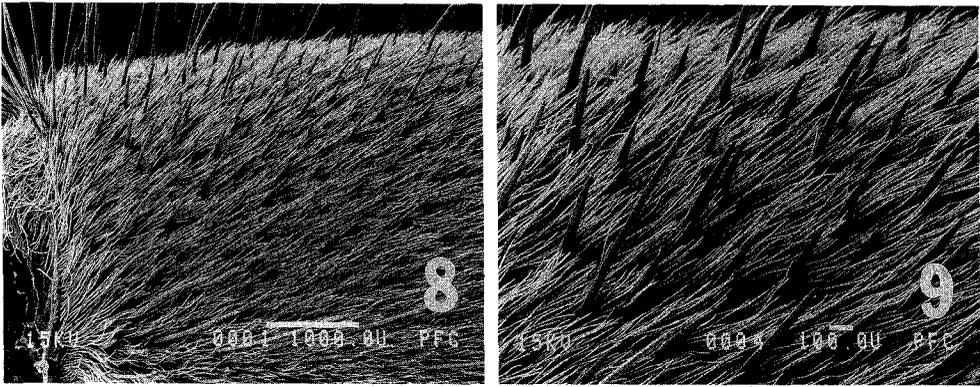
shade than distal segments; dorsal aspect bracken brown, ventral aspect dark earth brown. Dorsal aspect of patellae, tibiae, metatarsi, and tarsi I-III and corresponding palpal segments tortoise-shell brown, ventral aspect toffee brown (Pantone, 18-1031). Leg IV entirely bracken brown.

Carapace similar to holotype but with caput

Table 2.—*Crassicrus lamanai* new genus and new species. Female paratype; length of leg and pedipalp segments (mm).

Leg	I	II	III	IV	Palp
Coxa	8.5	7.5	7.4	8.3	6.5
Trochanter	2.3	1.7	3.2	3.8	1.5
Femur	15.4	14.1	12.9	16.5	11.3
Patella	9.2	8.2	7.7	9.2	6.6
Tibia	10.0	9.1	7.7	12.3	7.9
Metatarsus	9.9	9.0	10.8	14.6	—
Tarsus	7.0	7.0	6.1	6.5	7.3
Total length	62.3	56.6	55.8	71.2	41.1

more distinctly elevated; fovea as in holotype. Anterior eye row slightly procurved, less so than in holotype; AME round, diameter 0.7, separated by 0.3; ALE ovoid, 0.3 × 0.6. Posterior eye row crescentic; PME round, diameter 0.3; PLE ovoid, 0.3 × 0.4, separated by 1.3. Clypeus absent. Coxae without plumose setae; short, spiniform setae on coxae I and II as in holotype. Trochanters of femora I and II with fine plumose hairs as in holotype. Femora II-IV with numerous thorn-like setae along entire ventral and ventro-prolateral surface (Figs. 8, 9). Tarsal scopulation complete and entire. Metatarsal scopulation complete and entire. Metatarsal scopulation entire: I, complete; II, 0.87; III, 0.65; IV, 0.18. Spermathecae discrete, a broad low mound with two compact lobes, total width at base 2.5; lobes without basal taper and proximally connected for half their length, free extension of lobes 0.8 long (Fig. 7). *Spination*: Leg II, tibia 1d(p0.66) 1v(ap); leg III, metatarsus 7v(2am 1ar 1r0.46 1m0.46 1m0.45 1br), tibia 6v(2am



Figures 8, 9.—*Crassicrus lamanai* new genus and new species. Female from 5 km S Belmopan, Cayo District, Belize, scanning electron micrographs of femur III, ventro-prolateral view. 8, Showing distribution and density of thorn-like setae on basal portion of segment; 9, Detail of thorn-like setae emerging through pile hairs. Scale line in Fig. 8 = 1 mm, scale line in Fig. 9 = 0.1 mm.

1er 1r0.55 1r0.21 1m0.21); leg IV, metatarsus 13v(2am 2ap 1er 2m0.73 2m0.63 1m0.58 1m0.52 2m0.36), tibia 3v(2ar 1ap); palp, tibia 1d(ap) 7v(2ap 2ar 2ep 1b).

Variation.—*Males (four, including holotype):* Length, range (mean \pm SD) 36.6–40.1 (38.0 ± 1.6), carapace length 16.3–17.3 (16.7 ± 0.4), width 13.9–15.7 (14.8 ± 0.9), carapace width/length 0.84–0.92 (0.88 ± 0.04); three specimens with 11 or 12 macroteeth (10, 11 in one individual). Labial cuspules 24–64 (52 ± 19); maxillary cuspules 134–199 (174 ± 20) per maxilla. Leg span 131.7–152.5 (142.4 ± 9.8). Tibia IV weakly-to-moderately incrassate in all specimens examined, maximum width 0.74–0.98 (0.84 ± 0.1) \times maxi-

mum width of femur IV. Variation in leg and palp segment lengths in Table 3. Extent of metatarsal scopulation: I, fully scopulate on all specimens; II, 0.67–0.83 (0.76 ± 0.07); III, 0.47–0.61 (0.50 ± 0.07); IV, 0.14–0.26 (0.19 ± 0.05). Palpal embolus morphology uniform with regard to the presence of spiraling apical keels, but keel number varied from 5–6 (two individuals respectively).

Females (five): Length 43.9–51.1 (48.5 ± 3.0), carapace length 15.2–22.0 (19.2 ± 2.7), width 13.5–18.5 (16.7 ± 2.0), carapace width/length 0.81–0.89 (0.87 ± 0.03). Most specimens with 13 or 14 macroteeth (12, 14 in one individual). Labial cuspules 82–122 (98 ± 16); maxillary cuspules 202–290 ($236 \pm$

Table 3.—*Crassicrus lamanai* new genus and new species. Four males including holotype; range (mean \pm SD) of log and pedipalp segment lengths (mm).

Leg	I	II	III	IV	Palp
Coxa	7.3–7.9 (7.5 \pm 0.3)	6.5–7.4 (7.0 \pm 0.4)	5.6–6.4 (6.0 \pm 0.3)	5.8–7.4 (6.5 \pm 0.7)	4.0–6.0 (4.7 \pm 0.9)
Trochanter	1.3–2.7 (2.2 \pm 0.7)	2.4–3.0 (2.7 \pm 0.3)	2.0–3.5 (2.7 \pm 0.8)	2.3–3.3 (2.7 \pm 0.4)	1.2–2.7 (2.1 \pm 0.6)
Femur	15.1–16.5 (15.8 \pm 0.7)	14.4–15.8 (15.2 \pm 0.8)	12.3–14.2 (13.0 \pm 0.8)	14.1–17.8 (16.1 \pm 1.5)	8.9–10.0 (9.4 \pm 0.5)
Patella	7.4–8.3 (8.0 \pm 0.4)	6.9–7.6 (7.2 \pm 0.4)	6.0–7.0 (6.5 \pm 0.4)	6.3–7.7 (7.0 \pm 0.6)	5.1–6.2 (5.6 \pm 0.4)
Tibia	11.6–14.0 (13.2 \pm 1.1)	11.0–12.7 (11.9 \pm 0.9)	9.7–11.2 (10.6 \pm 0.7)	13.5–15.7 (14.6 \pm 1.1)	7.4–9.0 (8.2 \pm 0.7)
Metatarsus	11.3–12.2 (11.8 \pm 0.4)	10.1–12.0 (11.2 \pm 0.8)	11.1–13.1 (12.0 \pm 0.8)	14.4–18.3 (16.8 \pm 1.7)	—
Tarsus	8.5–9.7 (9.0 \pm 0.6)	7.9–9.0 (8.6 \pm 0.5)	7.0–8.8 (8.2 \pm 0.8)	8.6–9.8 (9.4 \pm 0.5)	2.4–3.8 (3.1 \pm 0.6)

Table 4.—*Crassicrus lamanai* new genus and new species. Five female paratypes; range (mean \pm SD) of leg and pedipalp segment lengths (mm).

Leg	I	II	III	IV	Palp
Coxa	6.6–9.4 (8.1 \pm 1.0)	6.4–8.4 (7.3 \pm 0.7)	5.4–7.4 (6.7 \pm 0.8)	6.4–8.3 (7.6 \pm 0.8)	4.7–6.5 (5.8 \pm 0.8)
Trochanter	1.9–3.1 (2.4 \pm 0.5)	1.7–2.3 (2.0 \pm 0.2)	1.8–3.2 (2.3 \pm 0.6)	2.4–3.8 (2.8 \pm 0.8)	1.5–2.8 (2.0 \pm 0.5)
Femur	12.8–15.9 (14.6 \pm 1.4)	12.2–14.6 (13.5 \pm 1.2)	10.9–13.7 (12.2 \pm 1.3)	13.6–16.9 (15.6 \pm 1.4)	8.8–11.5 (10.3 \pm 1.2)
Patella	6.8–9.5 (8.5 \pm 1.1)	6.5–8.5 (7.7 \pm 0.8)	5.9–8.4 (7.3 \pm 0.9)	6.8–9.2 (8.2 \pm 0.9)	5.6–6.7 (6.4 \pm 0.4)
Tibia	8.6–11.5 (10.3 \pm 1.1)	8.7–10.4 (9.6 \pm 0.7)	7.7–9.8 (8.8 \pm 0.9)	11.8–14.0 (13.1 \pm 1.0)	5.7–7.9 (7.1 \pm 0.9)
Metatarsus	7.2–9.9 (8.3 \pm 1.1)	6.6–9.0 (8.0 \pm 0.9)	6.9–10.8 (8.7 \pm 1.5)	10.2–14.6 (12.4 \pm 1.6)	—
Tarsus	5.7–7.3 (6.8 \pm 0.6)	5.9–7.2 (6.6 \pm 0.5)	6.1–7.4 (6.7 \pm 0.6)	6.5–8.4 (7.5 \pm 0.8)	6.4–7.7 (7.2 \pm 0.5)

24) per maxilla. Leg span 112.6–140.5 (127.3 \pm 10.5). Tibia IV strongly incrassate in all adult specimens examined, maximum width 1.22–1.24 (1.23 \pm 0.01) \times maximum width of femur IV. An ontogenetic trend in the relative width of tibia IV; one subadult (leg span 112.6) with maximum width 1.12 \times maximum width of femur IV and juveniles examined in the field without incrassate podomeres. Variation in leg and palp segment lengths in Table 4. Characteristic two-toned coloration of freshly molted specimens fading to uniform tortoise-shell brown as ecdysis approaches. Extent of metatarsal scopulation: I, fully scopulate on all specimens; II, 0.73–0.81 (0.80 \pm 0.05); III, 0.51–0.65 (0.58 \pm 0.05); IV, 0.18–0.29 (0.24 \pm 0.05). No variation in spermathecae observed.

Distribution.—At this time, *Crassicrus lamanai* new species is only known from Belize. Specimens have been collected in the north near Lamanai Forest Reserve, Orange Walk District, southward along the W bank of the New River Lagoon, and in the Cayo District, off the Hummingbird Highway. The northern half of Belize consists of low-lying hills, flat plains and swamps. The terrain changes dramatically in the southern half of Belize. A northern extension of the Maya Mountains known as Mountain Pine Ridge plateau transects the country in an east-west direction. Similar habitat to the north and northwest of the type locality suggest that *C. lamanai* may occur in Guatemala and Mexico.

Natural history.—The local Creole Indians

call this species “antelope spider” based on the mistaken belief that the swollen rear legs allow it to jump great distances (E.C. Welling M., pers. comm.). Typical habitat is open areas, including man-made clearings such as corn and banana plantations. Despite intensive effort, *C. lamanai* was not found in areas of undisturbed forest where the tree canopy obscured direct sunlight from reaching the ground. This species appears to avoid shaded areas in favor of open, sunny terrain. Burrows were located in sunny clearings, often beneath partially buried limestone boulders. Soil at the type locality consisted of a layer of humus overlying a marl bed. In a random sample ($n = 6$) of burrows examined during September 1995, entrance width ranged from 17.8–46.1 (33.1 \pm 10.7) and length ranged from 120.0–469.0 (298.7 \pm 114.9). Burrows were straight with angle of descent nearly perpendicular to the ground surface plane, and were restricted to the humus overlayer.

Crassicrus lamanai is active throughout the year, except during the time immediately preceding ecdysis and while guarding eggs, at which time the burrow entrances are occluded with a soil plug, as described by Minch (1979) for *A. chalcodes* Chamberlin 1940. During daylight hours, the entrances of active burrows are draped with a thin sheet of silk. At night the spiders are at the burrow entrance, facing outward with legs I and II extended outside the burrow. Mature males begin appearing in late June and are abundant by late September.

Females visibly heavy with ova were collected during January; but specimens examined in May, July and September were thin and did not appear to contain eggs. Oviposition occurred in the laboratory during March. Ootheca were impregnated with a dense covering of abdominal hairs, similar to the behavior reported by Marshall & Uetz (1990) for *Megaphobema* (Pocock 1901). Eggs laid in captivity failed to hatch. Exact egg counts were not made, although large females were estimated to lay 350–400 eggs.

Crassicrus lamanai is sympatric with *Brachypelma vagans* (Ausserer 1875). Burrows of these two species were often found in the same open habitat with intermixed burrow aggregations composed of both taxa.

DISCUSSION

The most striking feature of *C. lamanai* is the very incassate, barrel-shaped tibia IV. *Eupalaestrus* from SE South America is the only other Western Hemisphere theraphosid genus to have this apomorphic feature (Pocock 1901; Bucherl 1947; Raven 1985; Perez-Miles 1992). However, the potential affinity between these two genera is uncertain. While both *Crassicrus* and *Eupalaestrus* have all tarsal scopulae entire, only the latter possess a scopulated pad on the retrolateral surface of femur IV. *Crassicrus* have only type I urticating hairs while *Eupalaestrus* possess type I and II (Perez-Miles 1992) urticating hairs on the abdomen. Additionally, female *Crassicrus* possess short, thorn-like setae on the entire ventral and ventro-prolateral surface of both coxae and femora II–IV, with number and stoutness increasing from legs II–IV. This is considered here to be an autapomorphic generic feature.

Crassicrus lamanai is sympatric with the theraphosine genus *Brachypelma* Simon 1891. Smith (1994) mentioned fine plumose hairs on leg I trochanter and femur in *Brachypelma*, but failed to describe where they were situated. Examination of *B. auratum* Schmidt 1992, *B. smithi* (F.O.P.-Cambridge 1897) and *B. vagans* revealed that the fine plumose hairs occur on the retrolateral palp trochanter and femur as well as on the opposing prolateral leg I trochanter and femur. In contrast, both male and female *Crassicrus* possess plumose hairs on the prolateral face of trochantera and femora I and II.

Material examined.—The type specimens and the following: **BELIZE:** *Cayo District:* 5.0 km S Belmopan (Hummingbird Hwy.), 23 November 1984, 6♀2imm, E.C. Welling M. (RCW Col.); 12 February 1988, 4♀1imm, E.C. Welling M. (RCW Col.); 30 June 1991, 1♂1subad♂, E.C. Welling M. (RCW Col.).

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