A new species of ant mimicking spider, *Myrmecotypus jasmineae* (Araneae: Corinnidae: Castianeirinae), from Nicaragua

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Spiders of the corinnid genus *Myrmecotypus* Pickard-Cambridge, 1894 are known for being morphological and behavioral mimics of ants (Reiskind 1969, 1977; Cushing 1997, 2012; Rubio & Arbino 2009; Rubio *et al.* 2013). This genus currently includes nine species from to the New World. They occur from the United States (one species) to Argentina (one species), but most (seven species) occur from Mexico to Panama (Reiskind 1969; Rubio & Arbino 2009, Platnick 2014). A new species, *M. jasmineae*, from Nicaragua is described here from two males. A key to males and females of *Myrmecotypus*, adapted from Reiskind (1969), is modified to include all of the known species.

Materials and methods

Descriptions and terminology mostly follow Reiskind (1969). All specimens were illustrated, examined and measured using Olympus SZ60 and Zeiss Stereo Discovery V8 stereo microscopes equipped with ocular micrometers. Images were taken using a Visionary Digital BK Plus system (www.visionarydigital.com, R. Larimer). Several ratios used provide an index of shape including the following: cephalic index = cephalic width / carapace width × 100; carapace index = carapace width / carapace length × 100; sternum index = sternum width / sternum length × 100; abdominal index = abdominal width / abdominal length × 100. A high cephalic index represents a wide cephalic region and helps to distinguish *Myrmecotypus* from other corinnid genera (Reiskind 1969). The remaining ratios probably represent morphologic adaptation to ant mimicry since ants typically exhibit a thinner, more elongate body than do spiders (Reiskind 1969, 1970; Rubio *et al.* 2013). Cephalic width was measured as the distance across the dorsal carapace at the level of the posterior eye row. All leg and pedipalp measurements were taken from left appendages and measured with the leg in lateral aspect. Leg length is reported in the text as: total length (coxa, trochanter, femur, patella, tibia, metatarsus, tarsus). Pedipalp length denoted as: total length (trochanter, femur, patella, tibia, tarsus). Tibia I ventral spination is denoted by two numbers, the first the number of prolateral ventral spines and the second the number of retrolateral ventral spines. Abbreviations used in the text and figures are: AAS = anterior abdominal setae; AER = anterior eye row; ALE = anterior lateral eyes; AME = anterior median eyes; DS = dorsal sclerite; Em = embolus; ES = epigastric sclerite; ImS = inframammilliary sclerite; PAS = posterior abdominal setae; PER = posterior eye row; PLE = posterior lateral eyes; PME = posterior median eyes; RTA = retrolateral tibial apophysis; VS = ventral sclerite. All measurements reported in millimeters. The holotype and paratype are deposited in the Museum of Southwestern Biology, University of New Mexico (MSBA, K.B. Miller, curator).

Corinnidae Karsch, 1880

**Myrmecotypus** O. Pickard-Cambridge, 1894


**Diagnosis.** *Myrmecotypus* can be distinguished from other corinnid genera by: (1) the absence of a thoracic groove, (2) a narrowed carapace (carapace index less than 60), (3) wide cephalic region (cephalic index range 64–89), (4) PER nearly
straight and only slightly wider then AER, (5) PME–PME greater then PME–PLE (Reiskind 1969; Rubio & Arbino 2009).

*Myrmecotypus jasmineae* sp. n.
Figs 1A–G, 2A–F

**Type material.** Holotype ♂ (MSBA 30574) and 1 ♂ paratype (MSBA 30575) from Nicaragua: Granada Dpto: Las Plazuelas (11.77082°N –85.96146°W), 62m, 17 May 2012 (leg. K. B. Miller, M. P. Leister and R. Mallis).

**Other material examined.** 1 immature ♀ (MSBA 30576) from Nicaragua: Granada Dpto: Las Plazuelas (11.77082°N –85.96146°W), 62m, 17 May 2012 (leg. K. B. Miller, M. P. Leister and R. Mallis).

**Etymology.** The name is a noun of the genitive case. The species name is for the daughter of Matthew Leister, Jasmine E. Leister. She has taught Matthew Leister to stay young at heart and to always follow his dreams.

**Diagnosis.** Males of *Myrmecotypus jasmineae* can be distinguished from those of other species by the following combination of characters: (1) coxae coloration (coxae II and III translucent white, coxae I and IV black), (2) the presence of a terminal denticle on the promargin of the chelicerae, (3) the ventral spination of 3–2 on tibia I, and (4) the male embolus with a distinctly twisted tip (Fig. 1B, E, G; 2D–F).

**Description.** Male (Holotype): Body length 3.75. Carapace length 1.95; width 1.10; carapace index 56. Cephalic width 0.75; cephalic index 68. Sternum length 0.90; width 0.60; sternum index 0.67. Abdomen length 1.70; width 1.20; abdominal index 71. Dorsal sclerite length 1.65; width 1.20. Epigastric sclerite length 0.50; width 0.75. Ventral sclerite length 0.70; width 0.50. Inframamilliiary sclerite length 0.25; width 0.30. Eyes: AME 0.125; ALE 0.050; PME 0.075; PLE 0.075; AME–AME 0.075; AME–ALE 0.025; ALE–PLE 0.075; PME–PME 0.175; PME–PLE 0.075. Carapace black, granulose, elongate, oval slightly constricted at cephalic region, anterior margin truncate, sparse white setae throughout; eight eyes formed in two rows; PER very slightly recurved, posterior eyes sub-equal, small; AER slightly recurved, AME largest, nearly three times diameter of ALE, ALE small; PER wider than AER; thoracic groove absent, slight depression seen (Fig. 1A; 2A).

FIGURES 1A–G. *Myrmecotypus jasmineae* sp. n. A–C. Habitus male; A. Dorsal view; B. Ventral view; C. Lateral view; D–G. Left male pedipalp; D. Prolateral view; E. Ventral view; F. Retrolateral view; G. Male embolus. AAS—anterior abdominal seta, DS—dorsal sclerite, Em—embolus, ES—epigastric sclerite, ImS—inframamillary sclerite, PAS—posterior abdominal seta, RTA—retrolateral tibial apophysis, VS—ventral sclerite. (Original illustrations by Matthew Leister).
Abdomen with dorsum black, round, longer than wide, widened posteriorly; dorsal sclerite nearly complete, black, granulose, covered in sparse white setae intermixed with faint feathery setae; anterior pair of abdominal setae long, thin, posterior pair of abdominal setae long, slightly thicker than anterior pair (Fig. 1A, C; 2A); venter brown-black, covered in white setae, faint white feathery setae seen on lateral sides below epigastric sclerite; epigastric sclerite round, brown-black; ventral sclerite rectangular, longer than wide brown-black; inframamillary sclerite round, brown-black ending posteriorly with small tubercle bearing a row of short stout black setae (Fig. 1B; 2D).

Sternum brown-black, longer than wide, shield-shaped, covered in sparse long white setae, contiguous with intercoxal sclerites and precoxal triangles; labium brown-black, square, rounded anteriorly; endites brown-black, rectangular, longer than wide (Fig. 1B; 2D); chelicerae black, two retromarginal teeth and two promarginal teeth more proximally placed, distal promarginal tooth largest, prominent denticle just beyond distal tooth on promarginal side (Fig. 1B).

Coxa I black, coxae II, III translucent white with slightly darkened laterally, coxa IV black with faint lightening ventrally on distal margin (Fig 1A–C; 2A, D); trochanters following pattern of coxae; trochanter IV very slightly notched; proximal margin of femur I black, remainder white with two black ventro-lateral longitudinal lines, dorsal

FIGURES 2A–F. Myrmecotypus jasmineae sp. n. A, D. Holotype male, B, E. Paratype male, C, F. Female, juvenile; A–C. Dorsal view; D–F. Ventral view.
surface yellow with medial black line tapering distally, patella, tibia, and metatarsus I yellow with black pro- and retrolateral lines, tarsus I yellow; femur II white ventrally, black on prolateral surface, retrolateral surface proximally brown-black fading to white distally, black line on distal half of dorsal surface, patella, tibia, and metatarsus II yellow with black pro- and retrolateral lines, tarsi II yellow; femur III black, patella III brown black, dorsally lightened, tibia III black fading distally on dorsal surface to yellow-brown, metatarsus III ventrally black fading to yellow-brown distally, dorsally yellow-brown fading to yellow, pro- and retrolaterally brown black, tarsi III white; femur IV black, patella IV brown black, dorsally lightened, tibia IV black, metatarsus IV black fading distally to yellow-brown, tarsi IV yellow-brown (Figs 2A, D); tibia I ventral spination 3–2 with long, thin spines.

Pedipalp with very small pointed RTA at distal end of tibia, continuing proximally as thin sclerotized ridge; genital bulb globose, extending into thick neck, ending in distinctive, twisted embolus (Figs 1D–G).

Leg formula: assumed, IV, I, II, III, (leg II incomplete).

**Variation. Male paratype:** Body length 3.85. Carapace length 1.95; width 1.10; carapace index 56. Cephalic width 0.85; cephalic index 77. Sternum length 0.85; width 0.55; sternum index 65. Abdomen length 1.75; width 1.15; abdominal index 66. Dorsal sclerite length 1.60; width 1.15. Epigastric sclerite length 0.55; width 0.80. Ventral sclerite length 0.75; width 0.50. Inframamillary sclerite length 0.20; width 0.35. Coloration: red-orange carapace, chelicerae and legs (Figs 2B, E). Leg formula: IV, I, II, III.

**Distribution.** Known only from the type locality.

**Remarks.** A penultimate female specimen examined. Body length 4.20. Carapace length 2.05; carapace width 0.95; carapace index 46. Cephalic width 0.80; cephalic index 84. Sternum length 0.90; sternum width 0.60; sternum index 67. Abdomen length 2.00; abdomen width 1.25; abdominal index 63. Similar to male holotype in coloration (Figs 2C, F), spination, eye arrangement, cheliceral teeth. Dorsal, epigastric, ventral and inframamillary sclerites not evident; epigynum with some sclerotization of spermathecae evident, indicating a penultimate specimen.

**Discussion**

Reiskind (1969) diagnosed the genus *Myrmecotypus* as having tibia I ventral spines as being paired in a 2–2, 3–3 or 4–4 arrangement, and a carapace index of 39–53. *M. jasmineae* has an unpaired spination on the ventral tibia I in a 3–2 arrangement in all three specimens. Furthermore, the two adult male specimens examined have a carapace index that falls slightly out of the diagnostic range for the genus (56 for the holotype and the male paratype). However, the lack of a thoracic groove, the eye arrangement and size, and the cephalic index are each characteristic of the genus *Myrmecotypus*. The translucent white color of coxae II and III and black color of coxae I and IV are characters shared with the two species in the *M. fuliginosus* species group–*M. fuliginosus* O. Pickard-Cambridge, 1894 and *M. lineatipes* Chickering, 1937, which are each currently known only from a single female. Mature females of *M. jasmineae* are not known. However, the two species of the *M. fuliginosus* species group lack the terminal promarginal cheliceral denticle seen in *M. jasmineae* and differ in the ventral tibia I spination (M. fuliginosus and M. lineatipes share ventral tibia I spination pattern of 2–2). These diagnostic characters of *M. jasmineae* are clearly evident in the penultimate female examined and are unlikely to be lost or change in the final molt. Therefore, it seems clear that this is a separate species from either of the other two in the *M. fuliginosus* group, despite the lack of knowledge of the males in those species.

A close inspection of other museum specimens and more field work is needed to describe the adult female of this species, to determine what species of ant is used as the model, if the color variation seen in *M. jasmineae* is an adaptation to use more than one ant species as a model, and to determine mimetic function of *M. jasmineae*.

**Key to males and females of *Myrmecotypus* (modified from Reiskind, 1969)**

1a. Tibia I ventral spination 2–2; all eyes of similar size; abdomen strongly constricted medially (Reiskind, 1969, figs 111, 112, 153–155) (eastern U.S.A.) .......................................................................................................................... *M. lineatus*  
1b. Tibia I ventral spination 3–2, 3–3 or 4–4, AME larger than other eyes; abdomen oval to round without constriction .......................................................... 2

2a. Coxae I and II bright white to yellow-white, much lighter than coxae III and IV .......................................................................................... 3
2b. Coxae I never white, and either coxae II and III or just coxa II light .................................................................................................................. 6

3a. Carapace with a deep groove between the cephalic and thoracic regions; small (carapace length 1.75–2.30) .......................... 4
3b. No deep groove on carapace; larger (carapace length 2.45–5.75) .................................................................................................................. 5

4a. Orange-brown carapace in both males and females; male with curved embolus, base of cymbium with heavy spines
near lateral edge (Reiskind 1969, figs 258–261, 289) (Panama) ............................................................ M. olympus
4b. Dark brown-black carapace in both males and females; male with short pointed embolus, base of cymbium without spines (Reiskind 1969, figs 253–257, 288) (Panama) ............................................................ M. orpheus
5a. Large (carapace length 5.15–5.75 mm) with a longitudinal row of erect, dense hairs on thoracic region; male genital bulb globose, with thick neck distally twisted, terminating in a single small pointed embolus, no conductor evident; female epigynum ventrally with horizontal sclerotized ridge, two lateral openings, dorsally spermathecae moderately globose (Reiskind 1969, figs 262–265, 287) (Panama) ............................................................ M. rettenmeyeri
5b. Smaller (carapace length 2.45–2.65 mm); male genital bulb globose, with thick neck terminating in two structures, a straight embolus and a hooked conductor; female epigynum ventrally with two flared openings, dorsally with long globose spermathecae (Reiskind 1969, figs 241–244, 286) (Panama) ............................................................ M. niger
6a. Coxa II light yellow-white, rest of coxae dark ................................................................. ................................ 7
6b. Coxae II and III much lighter than coxae I and IV (Figs 1 A–C, 2 D–F) ............................................................. 8
7a. Large (carapace length 3.16–5.06 mm) male pedipalp with short blunt RTA, genital bulb globose with long neck terminating with a small, twisted embolus (Rubio & Arbino, 2009, figs 1–10) (Argentina) ............................................................ M. iguazu
7b. Smaller (carapace length 2.30–2.95 mm) male pedipalp without RTA, genital bulb globose with thick neck, terminating with a spiraled embolus (Reiskind, 1969, figs 245–248) (Mexico to Panama) ............................................................ M. pilosus
8a. Tibia I ventral spination 3–2; chelicerae with two promarginal teeth and a small promarginal denticle; female unknown (Nicaragua) .............................................................................................................................. M. jasmineae
8b. Tibia I ventral spination 3–3; chelicerae with two promarginal teeth, never a denticle; male unknown ................. 9
9a. Female epigynum ventrally with small lateral openings at the edge of a horizontal lip, dorsally with two globose spermathecae, with wide posteriorly extending necks (Reiskind, 1969, figs 251–252) (Mexico) ........ M. fuliginosus
9b. Female epigynum ventrally with two large flared openings, dorsally with two, slightly, globose spermathecae with thin posterior necks (Reiskind, 1969, figs 249–250) (Panama) ............................................................ M. lineatipes

Checklist of valid species of Myrmecotypus

Myrmecotypus fuliginosus O. Pickard-Cambridge, 1894; Mexico.
Myrmecotypus iguazu Rubio & Arbino, 2009; Argentina.
Myrmecotypus jasmineae, sp. n.; Nicaragua.
Myrmecotypus lineatipes Chickering, 1937; Panama.
Myrmecotypus lineatus (Emerton, 1909); U.S.A.
Myrmecotypus nigcr Chickering, 1937; Panama.
Myrmecotypus olympus Reiskind, 1969; Panama.
Myrmecotypus orpheus Reiskind, 1969; Panama.
Myrmecotypus pilosus O. Pickard-Cambridge, 1898; Mexico to Panama.
Myrmecotypus rettenmeyeri Unzicker, 1965; Panama.

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