



## Revision of the spider genus *Epiceraticelus* (Araneae, Linyphiidae) with a description of a new species

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### Abstract

The type species of the genus, *Epiceraticelus fluviialis* Crosby & Bishop, 1931, is herein redescribed since the types are presumed lost. In addition, a new species, *Epiceraticelus mandyae* n. sp., from the Southeastern United States is described.

**Key words:** Erigoninae, sheet-web spider, money spider, dwarf spider, Eastern USA

### Introduction

The genus *Epiceraticelus* was created by Crosby and Bishop (1931) based on 19 specimens from New York state, USA. The genus was thought to be similar to *Ceraticelus* Simon, 1884 and *Ceratinella* Emerton, 1882 but was created due to the different shape of the embolus and the lack of a scutum on the abdomen. The genus was also considered to be similar to *Walckenaeria* Blackwall, 1833 but was determined to be unique due to the palpal tibial structure consisting of two closely appressed pieces. The genus has remained monotypic since its inception with a single species, *Epiceraticelus fluviialis* Crosby & Bishop, 1931. Ivie (1967) determined that *Scylaceus amylyus* Chamberlin, 1949 is actually a junior synonym of *E. fluviialis*. Since then, there has been no taxonomic work on the genus.

This species has been reported in the literature from New York (Crosby and Bishop 1931), Ohio (as *Scylaceus amylyus*—Chamberlin 1949, Sierwald *et al.* 2005), Indiana (Louderman and Clarke 2011; Milne *et al.* 2016), Mississippi (Ryndock *et al.* 2012), New Jersey (Vogel 1964), Washington D. C. (Banks [No date]), Texas (Burke 1987; Anderson 1988), Illinois (Louderman *et al.* 2013), and South Carolina (Stellwagen 2011). The presence of this species in these states give it an Eastern US distribution. Figure 1 displays all records that have been examined by the authors, which originate from the authors' private collections and from museum collections.

The new species within this genus, *Epiceraticelus mandyae* n. sp., is known from scattered locations in the Southeastern United States. This species was independently discovered at separate locations by the first three co-authors of this manuscript and was tentatively placed into a different genus by each author. Given the morphological and taxonomic similarities between *Epiceraticelus*, *Grammonota* Emerton, 1882, and *Ceraticelus*, this is unsurprising. We now believe that this new species belongs in *Epiceraticelus* due to certain morphological similarities. Specifically, both species (*E. mandyae* n. sp. and *E. fluviialis*) are relatively small and pale-colored with reduced spination. Both males possess a palp that consists of a long sinuous embolic division that circles around the distal end along with a long tibial apophysis that includes fine serrations on the medial side. In the female, both species' epigyna possess a median plate that is wider posteriorly than anteriorly and copulatory openings near the midline between the spermathecae. It is unknown if the distributions of the two species overlap, but these species have never been collected together, so it's possible that they are allopatric.

The specimens examined herein are from the private collections of the authors. The holotype of *E. mandyae* n. sp. was deposited in The Field Museum (FMNH; Petra Sierwald, Curator); paratypes are placed at the American Museum of Natural History (AMNH; Lorenzo Prendini, Curator).



FIGURE 1. Collection localities of *Epiceraticelus fluvialis* (filled circles) and *Epiceraticelus mandyae n. sp.* (filled stars).

## Methods

All measurements are in millimeters. Measurements were taken electronically using a Leica M165C stereoscope and associated Leica Application Suite software (LAS Ver. 4.9.0 [Build: 129], Leica Microsystems, Switzerland). Measurements of male carapace length and total length excluded the length of the carapace modifications. Carapace width was measured at the widest part of the carapace. One male specimen of *Epiceraticelus mandyae n. sp.* was placed overnight in 1% bleach solution to examine the tracheal system, following Millidge (1984). Specimens were prepared for SEM photography by dehydration using ethanol solutions that graduated from 70% to 100%. Speci-

mens were then placed in Hexamethyldisilazane (HMDS; 99+%; Alfa Aesar, Heysham, England) for 5 minutes before being removed and placed on filter paper to dry for 5 minutes. Specimens were then mounted on SEM stubs using 12 mm Pelco Tabs™ (TED PELLA, Inc.-carbon conductive tabs), sputter coated in gold (Cressington Scientific Instruments, Model No. 108) and photographed using a JEOL JCM-6000 NeoScope benchtop scanning electron microscope. Specimens were illustrated free-hand by visual inspection using the light microscope mentioned above. Illustrations were done using pencil and ink (Sakura PIGMA Micron pens).

Morphological nomenclature follows Hormiga (2000). The following abbreviations are used: ALE: anterior lateral eyes; AME: anterior median eyes; PLE: posterior lateral eyes; PME: posterior median eyes.

Material examined is from the following collections (abbreviations):

AMNH	American Museum of Natural History
DMNS	Denver Museum of Nature & Science
FMNH	The Field Museum
MLD	Collection of Michael L. Draney
MAM	Collection of Marc A. Milne
MCZ	Museum of Comparative Zoology
OSAL	Ohio State University Acarology Laboratory

## Taxonomy

### Family Linyphiidae Blackwall, 1859

#### *Epiceraticelus* Crosby & Bishop, 1931

*Epiceraticelus* Crosby & Bishop, 1931: 380.

**Type species.** *Epiceraticelus fluvialis* Crosby and Bishop 1931, by monotypy.

**Diagnosis.** Males may be separated from similar North American genera (e.g. *Ceraticelus*, *Ceratinella*, *Grammonota*, *Scylaceus*, and *Walckenaeria*) by possessing a large palpal tibial apophysis that is serrated on the medial margin (Figs. 2A, 3C, 4C, 6C). Females may be separated from other erigonines by having an epigynum split in half by two parallel copulatory grooves with copulatory openings positioned anteriorly and a widened rectangular median plate posteriorly (Figs. 2D, 3E, 4E, 6D). Males of *Epiceraticelus* are easily distinguished from *Scylaceus pallidus* by the long sinuous embolic division and by the fine serrations medially on the retrolateral tibial apophysis. Additionally, the narrow “pistol-shaped” tibial apophysis of *S. pallidus* is distinctive (Paquin and Dupérré 2003, Figs. 1230, 1231). *Epiceraticelus* and *Scylaceus pallidus* females are similar somatically and have a similar posteriorly-placed median plate, but in *Epiceraticelus*, it is triangular in shape rather than broadly rectangular (Figs. 2D, 3E, 4E, 6D). Moreover, the epigynum in *S. pallidus* has spermathecae that are more posteriolateral in position (Figs. 2C, 3F, 4D, 6E and Paquin & Dupérré 2003, Fig. 1232).

**Description.** Length: 1.1–1.3. Cephalothorax: eyes eight, AME smallest, ALE and PLE equal, PME approximately two-thirds the size of PLE, posterior eye row slightly procurved, anterior eye row slightly recurved; eyes ringed with black. Chelicerae with six or seven promarginal teeth, five retromarginal denticles. Carapace oval, two-thirds as wide as long with one to two medial setae; a pair of small setae between PME and AME of each side; anterior portion of carapace three times as high as section near pedicel, clypeal modifications variable, dusky orange to tan, sternum nearly as long as wide, pointed posteriorly between coxae of leg IV. Abdomen: oval, covered with simple setae, concolorous gray, venter gray with dark gray patches around spinnerets and near epigynum; epiandrous fusules absent; colulus twice as long as wide; anterior spinnerets longer than posterior, cone-shaped. Tracheal system desmitracheate (*sensu* Millidge 1984). Legs: light orange, unmarked; relative length 4, 1, 2, 3; patella–tibia I three-fourths as long as carapace; metatarsi I–III each with a single trichobothrium; paired tarsal claws with eight teeth, median claw with three teeth. Trichobothrium on metatarsus IV lacking. Trichobothrium on metatarsus I at 0.4–0.5. Tibial spines 1111, often 0000. Palp of male complex (Figs. 2B, 3A–B, 4B, 6A–B), with a well-developed retrolateral tibial apophysis which is finely serrated on medial margin; embolic division with elongate tail-piece oriented with long axis parallel to long axis of palp; tegulum with distal prottegulum; distal

suprategular apophysis present; long sinuous embolus present (Figs. 3A–B, 6A–B). Epigynum (Figs. 3EF, 6D–E) with dual sinuous median epigynal grooves widening into a posterior median plate (narrower and separated in *E. fluvialis*, while wider and fused in *E. mandyae* n. sp.), spermathecae ventrally visible, separated by more than 1.5 times their diameter; internally, spermathecae anterior of copulatory and fertilization ducts, laterally directed and partially covering spermathecae posteriorly.

**Distribution.** New York south to Georgia, west to Texas (Fig. 1).

**Natural History.** May be found in the leaf litter of damp forests in winter and early spring. Forests commonly consist of various species of pine and oak.

### *Epicraticelus fluvialis* Crosby & Bishop 1931

(Figs. 1–3)

*Epicraticelus fluvialis* Crosby & Bishop 1931: 380–381, figs. 76–79 (Description of male and female)

*Scylaceus amythus* Chamberlin 1949 (misidentification): 544, fig. 107

*Epicraticelus fluvialis* Ivie 1967: 127.

**Types.** *Epicraticelus fluvialis* Crosby & Bishop, 1931: 380 (male holotype and female allotype from Riverhead, NY, USA. Paratype material, 5 males and 11 females, from the same 11 April 1923 collection and labeled “Type” were examined for the redescriptions (AMNH)). This material is not called “Paratype” material in Crosby & Bishop (1931), but it is listed in the paper, the collection label includes the word “Type”, and the specimen is treated as type material by AMNH.

**Type data remark.** Originally deposited in collection of Cornell University, but never transferred to the American Museum of Natural History when the Cornell University collection was moved there. Presumed lost (Draney 1998; James K. Liebherr pers. comm.; Louis Sorkin pers. comm.).

**Diagnosis.** Males are easily distinguished from *E. mandyae* n. sp. by the lack of a clypeal projection (Fig. 3D versus 5A, 6F). Retrolateral tibial apophysis smaller than in *E. mandyae* n. sp. (Fig. 2A, 3C versus 4C, 6C). Females may be recognized by the epigynum possessing a relatively narrow (compared to the wider plate in *E. mandyae* n. sp.), rectangular, posteriorly-located median plate and dual anteriorly-located copulatory openings that are more anterior than in *E. mandyae* n. sp. (Figs. 2D, 3E versus 4E, 6D). Spermathecae anterior, wider than long with copulatory and fertilization ducts tracing a longer path, and copulatory ducts not flared into vase-like shapes as in *E. mandyae* n. sp. (Figs. 2C, 3F versus 4D, 6E).

**Description.** *Male:* Carapace resembling female, including the location of the three setae (Fig. 3D). Coloration of carapace, abdomen, and legs all resemble female. Palp: Tibial apophysis serrated, curved on retrolateral edge; this produces an appearance of two appressed pieces in ventral view (see Crosby & Bishop 1931, fig. 77); pointed (Figs. 2A, 3C); SEM reveals the “serrations” are a result of small, overlapping scales (Fig. 2A). Embolus elongated, sinuous; distally-directed, twisted distal suprategular apophysis; large papillate tegular sac curled prolaterally at distal edge; tailpiece straight, oriented with long axis of cymbium (Figs. 2B, 3A–B).

*Female:* Carapace dusky orange and slightly raised around eye region. Eyes each ringed with black. Three setae present along midline of carapace with first setae just behind PME and third setae just posterior of center. Abdomen gray, concolorous. Legs matching color of carapace. Spination typical for the genus. Epigynum with median posterior plate and dual median copulatory grooves that cut anteriorly towards dual copulatory openings (Figs. 2D, 3E). Internally, spherical spermathecae anterior with copulatory ducts externally directed and curving around fertilization ducts (Figs. 2C, 3F).

**Measurements.** ( $n = 7$ ): Total length, 1.1–1.3 (mean = 1.2); carapace length, 0.51–0.61 (mean = 0.56); carapace width, 0.38–0.44 (mean = 0.42); femur I length, 0.37–0.4 (mean = 0.39).

**Distribution.** Eastern United States from Texas to New York (Fig. 1). Except for the northernmost specimens, most specimens occur upland of the US southeastern coastal plain.

**Natural History.** Adults are usually collected from October–April from within the leaf litter in mature temperate forests.

**Material Examined.** U.S.A.: *District of Columbia:* Washington, (N 38°53', W 77°01'), coll. N. Banks (MCZ 86338), collection date not known, 1 ♀. *Indiana:* Brown County, Yellowwood State Forest (N 39°07'03.6", W 86°21'47.1"), deciduous forest, leaf litter, extracted, coll. M. Milne (MAM), 7 February 2015, 1 ♂; (N 39°08'16.6",

W 86°17'09.5"), pitfall, coll. M. Milne (MAM), 29 March 2015, 1♂1♀; (N 39°07'03.6", W 86°21'47.1"), leaf litter, extracted, coll. M. Milne (MAM), 5 April 2015, 1♀; (N 39°08'35.3", W 86°17'18.7"), pitfall, coll. M. Milne (MAM), 6 February 2016, 1♂; (N 39°07'17.5", W 86°22'15.1"), leaf litter, extracted, coll. M. Milne (MAM), 8 October 2016, 1♀; (N 39°07'12.6", W 86°21'59.6"), leaf litter, extracted, coll. J. Acosta and L. Frandsen (MAM), 4 February 2017, 1♀; (N 39°08'16.6", W 86°17'09.5"), pitfall, coll. J. Acosta and L. Frandsen (MAM), 5 February 2017, 1♀; (N 39°07'15.1", W 86°22'12"), leaf litter, extracted, coll. J. Acosta and L. Frandsen (MAM), 11 June 2017, 1♀; Monroe County, Morgan-Monroe State Forest (N 39°19'17.5", W 86°27'10.4"), deciduous forest, pitfall, coll. M. Milne (MAM), 29 March 2015, 1♂; (N 39°19'21.7", W 86°27'07.6"), leaf litter, extracted, coll. M. Milne (MAM), 3 April 2016, 1♀; (N 34°19'13.5", W 86°27'12.6"), pitfall, coll. B. Deno, M. Sparenberg (MAM), 8 October 2016, 1♀; (N 34°19'17.5", W 86°27'10.4"), pitfall, coll. B. Deno, M. Sparenberg (MAM), 8 October 2016, 1♀. *Mississippi*: Marshall County, Strawberry Plains Audubon Center (N 34°49'59", W 89°28'30"), deciduous forest, pitfall, coll. J. Ryndock (MLD), 26 October 2008, 1♂1♀; 28 October 2008, 2♂; leaf litter, 1 February 2009, 1♂; pitfall, 1 February 2009, 1♂. *New Jersey*: Ocean County, Lakehurst (N 40.0144, W 074.3117), coll. B. Vogel (DMNS ZA 1425), 18 April 1964, 2♀. *New York*: Suffolk County, Great Pond, north of Southold (N 41°5', W 72°27'), 22 September 1962, coll. W. Ivie, 2♀; Oak Woods, NW of Southold (N 41°5', W 72°27'), 7 May 1955, coll. W. Ivie (AMNH), 2♂5♀; Riverhead, 11 April 1923, coll. W. Ivie (AMNH), "Type", 4♂8♀. *Ohio*: Hocking County, Cantwell Cliffs, Rockbridge (N 39°32', W 82°34'), coll. W. Barrows (OSAL), 23 March 1928, 2♂1♀; Conkle's Hollow N. Pres. (N 39°27', W 82°35'), coll. R. Bradley (OSAL), 17 August 1996, 2♀; Rockbridge, 23 June 2015, 1♀. *South Carolina*: Greenville County (N 34°55', W 82°25'), 12 March 1954, coll. W. Ivie (AMNH), 4♀. *Texas*: Tyler County, 2.3 mi. W, 1.3 mi. N. Spurger Beech Woods Trail in beech and magnolia leaf litter, 24 April 1988, coll. R. S. Anderson (FNNH 000044416), 3♀. *Virginia*: Mecklenburg County, 15 October 2016, coll. M. and L. Milne (MAM) 1♂.

### *Epiceraticelus mandyae* new species

(Figs. 1, 4–6)

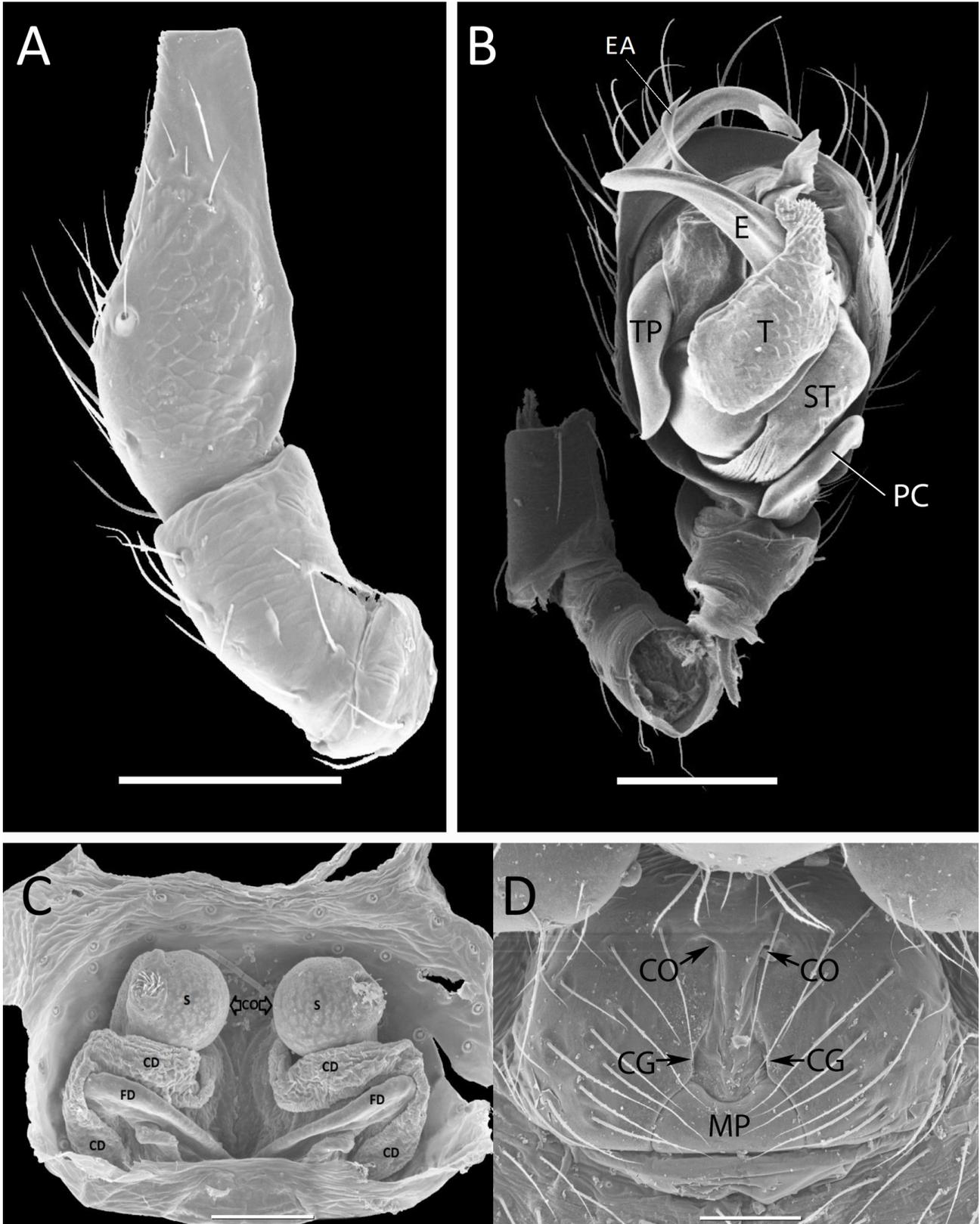
**Types.** Male holotype from U.S.A., South Carolina, Aiken Co., Savannah River Site, set-aside 2 (30°18'30"N, 81°43'30"W), medium-aged longleaf pines, pitfalls, 6–19 February 1996, Coll. M. Draney (FMNH). Female paratype: same data as holotype (FMNH).

**Etymology.** The species name is derived from the name of the late arachnologist, Amanda "Mandy" Howe (4 September 1983–20 August 2016), in honor of her contributions to the North American arachnology community.

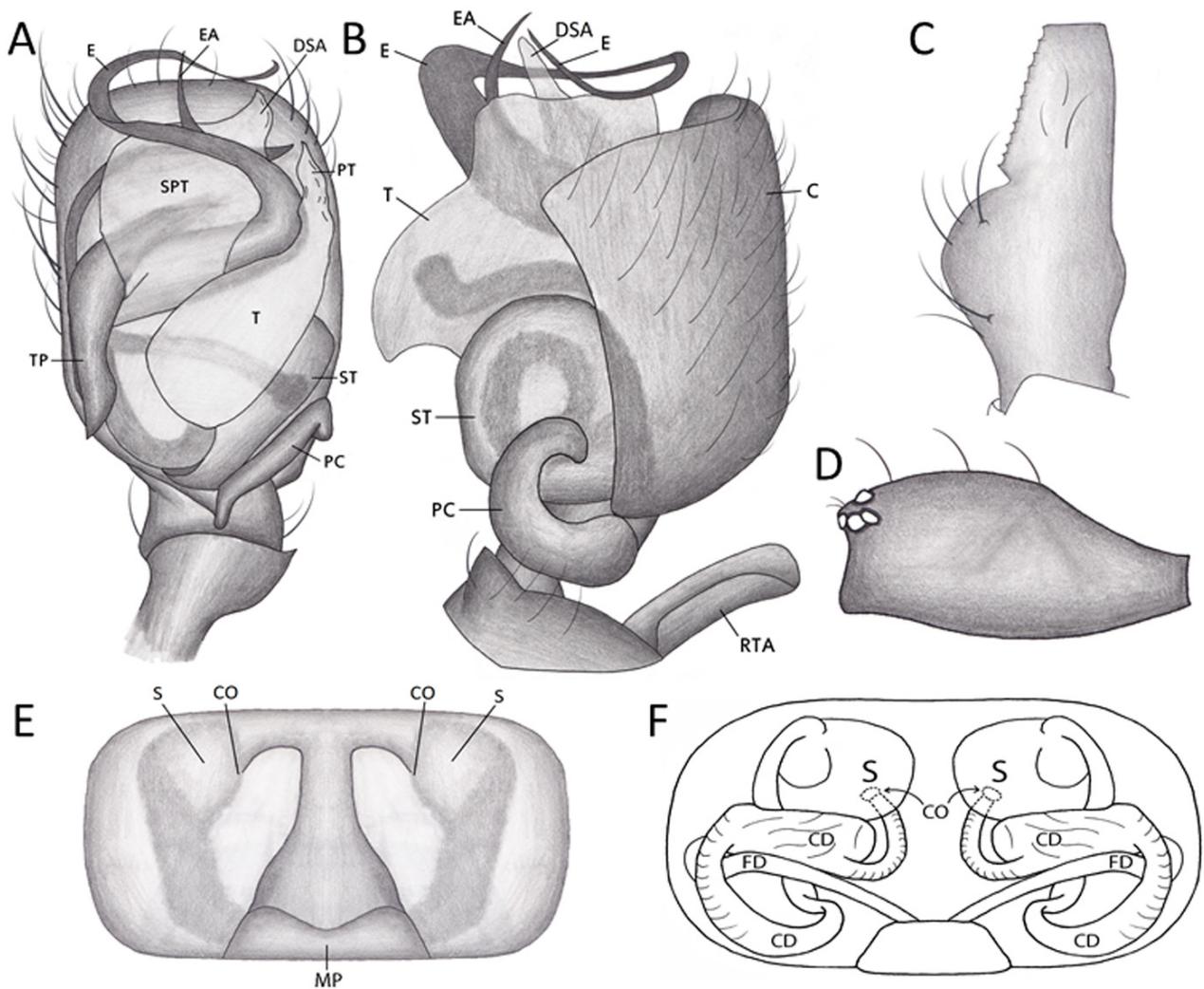
**Diagnosis.** Males are easily distinguished from *E. fluvialis* by the presence of a clypeal projection between the anterior median eyes and PME (Figs. 4A, 5, 6F). Male retrolateral tibial apophysis is distinctively larger than in *E. fluvialis* (Figs. 4C, 6C). Females have thick copulatory ducts similar to *E. fluvialis*, but the ducts are expanded to a greater extent into a Vase-like shape (Figs. 4E, 6D). Spermathecae anterior and oval, longer than wide (Figs. 4D, 6E).

**Description.** *Male (Holotype)*: Carapace projection dorsal to PME and ventral to AME (Figs. 4A, 5, 6F), approximately twenty-five ventrally-directed macrosetae on the distal third of the structure, many pores (visible with SEM) along sides of the projection (Fig. 5B). A pair of setae between PME and anterior median eyes on each side. Otherwise, carapace resembles female, including the location of the three setae. Coloration of carapace, abdomen, and legs all resemble female. Palp: retrolateral tibial apophysis concave, curved along both lateral edges, serrated and curved to a point on retrolateral edge, pointed (Figs. 4C, 6C); thick, elongated, Sinuous embolus with membrane that circles around distal portion of cymbium (Figs. 4B, 6A–B); distally-directed, slightly curved distal suprategular apophysis; large papillate tegular sac pointed distally; tailpiece straight, oriented with long axis of cymbium (Figs. 4B, 6A–B).

*Female (Paratype)*: Carapace orange, highest behind eyes. Eyes ringed with black. Three setae along carapace midline, first just behind PME and third just posterior of center. Abdomen gray, concolorous. Legs same color as carapace. Epigynum with wide median posterior plate and dual median copulatory grooves that cut anteriorly towards dual copulatory openings (Figs. 4E, 6D). Spermathecae anterior and oval, fertilization ducts large, flat, laterally directed, and partially overlapping spermathecae (Figs. 4D, 6E).



**FIGURE 2.** SEM micrographs of *Epiceraticelus fluvialis*: A, Retrolateral view of tibial apophysis of left palp of male. B, Ventral view of male left palp. C, Dorsal view of epigynum, cleared. D, Ventral view of epigynum. Abbreviations: CD, copulatory ducts; CG, copulatory grooves; CO, copulatory openings; E, embolus; EA, embolic apophysis; FD, fertilization ducts; MP, median plate; PC, paracymbium; S, spermathecae; ST, subtegulum; T, tegulum; TP, tailpiece. Scale bars, A, B, 0.1 mm; C, D, 0.05 mm.



**FIGURE 3.** Free hand Illustrations of *Epiceraticelus fluviatilis* (proportions are approximate): A. Male left palp, ventral view. B. Male left palp, retrolateral view. C. Retrolateral view of tibial apophysis of male left palp. D. Lateral view of male carapace; E. Ventral view of epigynum. F. Dorsal schematic of epigynum. Abbreviations: C, cymbium; CD, copulatory duct; CO, copulatory opening; DSA, distal suprategular apophysis; E, embolus; EA, embolic apophysis; FD, fertilization duct; MP, median plate; PC, paracymbium; PT, protégulum; RTA, retrolateral tibial apophysis; S, spermathecae; SPT, suprategulum; ST, subtegulum; T, tegulum; TP, tailpiece. Proportions are approximate.

**Measurements** ( $n = 21$ ): Total length, 1.1–1.4 (mean = 1.2); carapace length, 0.54–0.63 (mean = 0.59); carapace width, 0.43–0.49 (mean = 0.45); femur I length, 0.38–0.49 (mean = 0.44).

Carapace projection (Total length = 0.14–0.15, mean = 0.143,  $n = 7$ ).

**Distribution.** Eastern United States from Virginia to South Carolina and along the Gulf Coast to Louisiana; most specimens have been found at lower elevations on the southeastern Atlantic and Gulf coastal plain (Fig. 1).

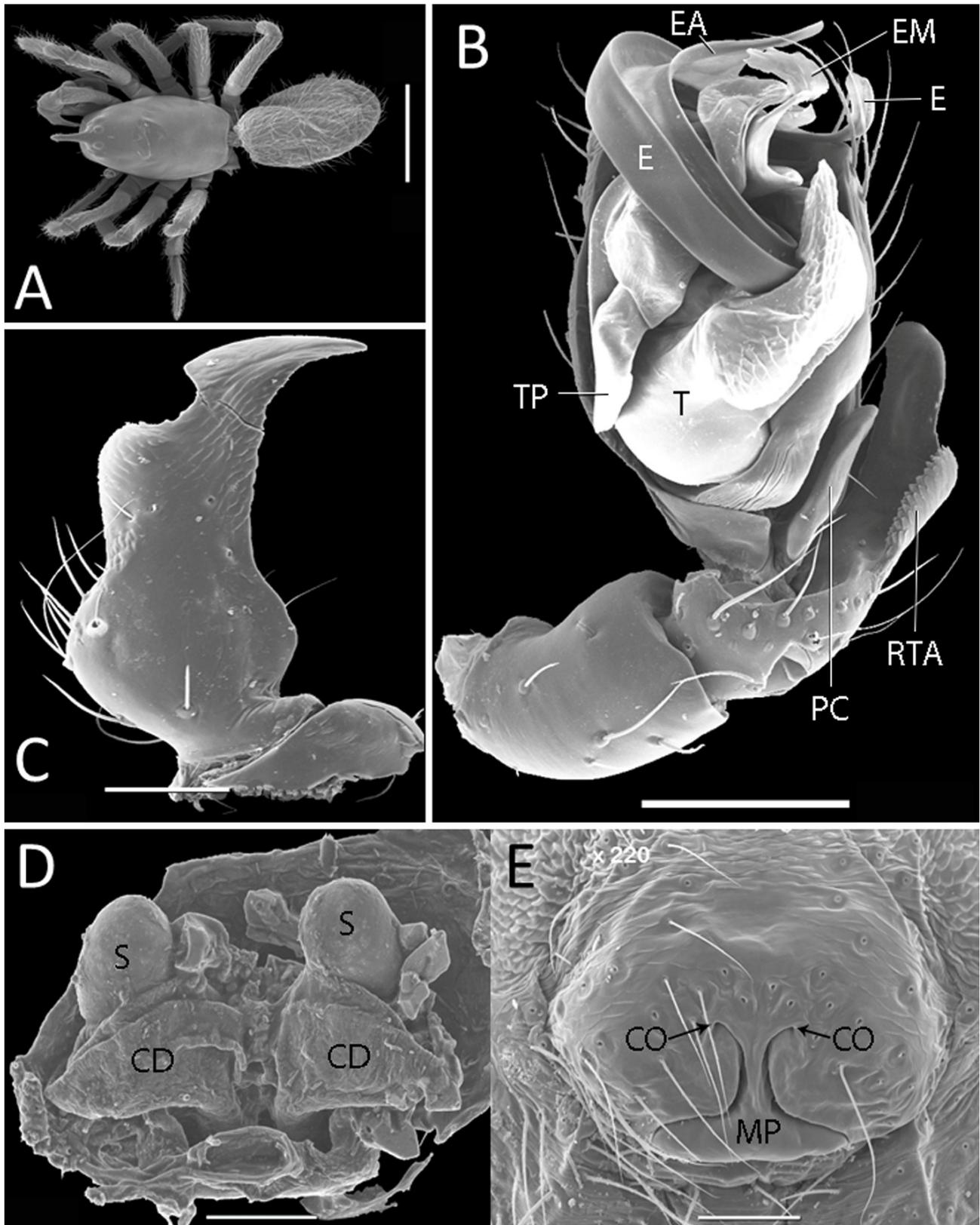
**Natural History.** Adults are usually collected from January–May. Specimens are usually taken from within the leaf litter in mature pine and oak forests.

**Material Examined.** U.S.A.: *Georgia*: Coffee County, Broxton Rocks (N 31°44'30", W 82°51'45"), granite outcrops, pitfall ("F-B-2"), coll. M. McAloon, D.V. Hagan, J.D. Spooner (MLD), 6 November 1998, 1♂; pitfall ("F-B-3"), 11 December 1998, 5♂ 3♀; pitfall ("F-B-1"), 2♀; Snow's Rock, in woods, pitfall, coll. J. D. Spooner (MLD), 19 February 1999, 1♂; Columbia County, Heggie's Rock Nature Preserve (N 33°32'31", W 82°15'19"), granite outcrops, pitfall traps, coll. J.D. Spooner (MLD), 31 Jan. 1996, 2♂; woods near granite outcrops, pitfall traps, coll. J. D. Spooner (FMNH), 21 February 1996, 3♂; DeKalb County, Stone Mountain (N 33°48', W 84°08'), forest leaf litter, coll. and date not known (MLD), 1♂. *Louisiana*: St. Tammany Parish, West Slidell (N 30°17', W 89°50'),

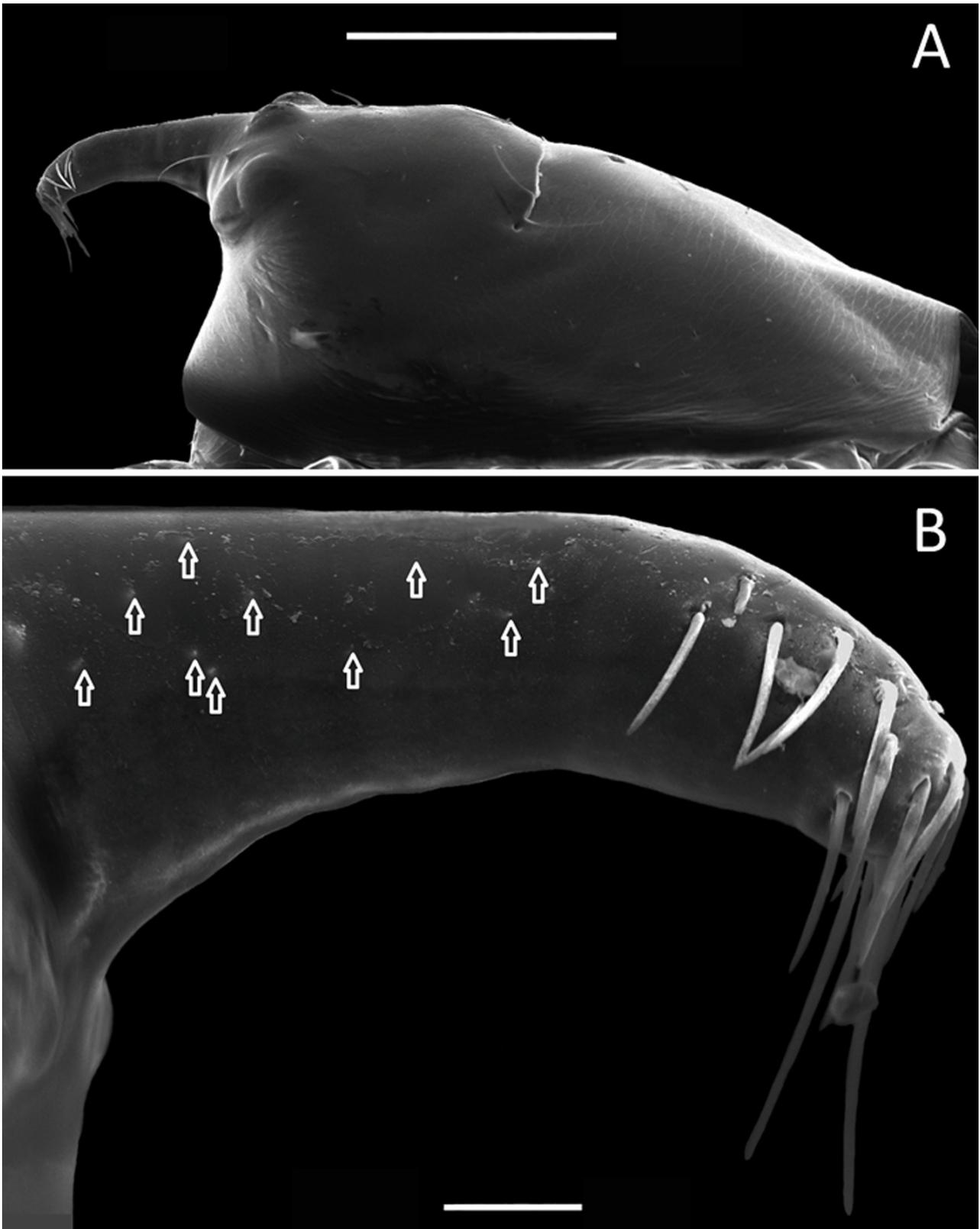
pine stump and buttress, pine remnant, coll. W.R. Suter (FMNH), 19 Nov. 1982, 9♂ 20♀. *South Carolina*: Aiken County: Jackson, 100 Cowden St. (N 33°19'15", W 81°47'15"), deciduous woods, pitfalls, coll. M. Draney (MLD), 8–12 March 1995, 1♀; 28 February–16 March 1995, 10♂; Savannah River Site, Set-aside #2 (N 33°18'30", W 81°43'30"), medium-aged longleaf pine stand, sifted litter samples, coll. M. Draney (MLD), 13 January 1995, 1♂; pitfalls, coll. M. Draney (MLD) 15–29 May 1995, 1♀; 29 May–12 June 1995, 3 ♀; 28 December 1995–8 January 1996, 1♀; 8–22 January 1996, 9♂ 1♀; litter sifting, coll. M. Draney (MLD), 28 January 1996, 2♂ 1♀; pitfalls, coll. M. Draney (MLD), 22 January–6 February 1996, 39♂; 6–19 February 1996, 49♂ 1♀; 19 February–4 March 1996, 14♂; 4–18 March 1996, 5♂; 18 March–1 April 1996, 5♂; litter sifting, coll. M. Draney (MLD), 15 April 1996, 1♀; pitfalls, coll. M. Draney (MLD), 1–16 April 1996, 1♂; Set-aside #29 (N 33°22', W 81°31'), xeric scrub oak/pines, sifting pine litter, coll. M. Draney (MLD), 25 October 1994, 1♀; litter sifting, coll. M. Draney (MLD), 28 March 1995, 1♀; pitfalls, coll. M. Draney (MLD), 8–22 January 1996, 1♂; 22 January–6 February 1996, 1♂; Set-aside #3 (N 33°16'30", W 81°44'30"), sandhills, xeric pine/oak, 17 January 1995, litter sifting, coll. M. Draney (MLD), 2♂ 8♀; Set-aside #4 (N 33°24', W 81°36'), large loblolly pines, pitfalls, coll. M. Draney (MLD), 1–15 May 1995, 1♀; 15–29 May 1995, 1 ♀; 29 May–12 June 1995, 1♀; 26 June–10 July 1995, 1♀; 28 December–8 January 1996, 1♀; 8–22 January 1996, 2♂; litter sifting, coll. M. Draney (MLD), 28 January 1996, 1♀; 22 January–6 February 1996, 7♂; 6–19 February 1996, 7♂; Set-aside #6 (N 33°14', W 81°44'30"), riparian hardwoods, litter sifting, coll. M. Draney (MLD), 20 November 1995, 2♂ 1♀; litter sifting, coll. M. Draney (MLD), 28 January 1996, 2♀; pitfalls, coll. M. Draney (MLD), 24 January–7 February 1996, 2♂; 7–21 February 1996, 2♂; Timber compartment 15, plot 16 (N 33°18'43", W 81°42'19"), loblolly pine forest, pitfalls, coll. M. Ulyshen (MLD), 12 January 2004, 8♂; Timber compartment 15, plot 13 (N 33°18'48", W 81°42'36"), loblolly pine forest, 12 January 2004, 4♂ 2♀; Timber compartment 15, plot 14 (N 33°18'52", W 81°42'36"), loblolly pine forest, coll. M. Ulyshen (MLD), 12 January 2004, 2♂; Young Pines Site: Junction of SRS Rd. 2 and M-line RR (N 33°18'30", W 81°43'30"), ca. 5 year-old longleaf pine stand, litter sifting, coll. M. Draney (MLD), 27–28 January 1996, 1♂; pitfalls, coll. M. Draney (MLD), 21 February 1996, 1♂; Allendale County: Savannah River Site, Set-aside #18 (N 33°08', W 81°26'30"), Boiling springs natural area, riparian old growth, litter sifting, coll. M. Draney (MLD), 26 April 1995, 1♀; pitfalls, coll. M. Draney (MLD), 17–31 May 1995, 1♀; 13–29 December 1995, 1♂; 10–24 January 1996, 2♂; litter sifting, coll. M. Draney (MLD), 28 January 1996, 1♀; pitfalls, coll. M. Draney (MLD), 24 January–7 February 1996, 5♂ 1♀; litter sifting, coll. M. Draney (MLD), 16 February 1996, 1♂; pitfalls, coll. M. Draney (MLD), 7–21 February 1996, 2♂; Barnwell County: Savannah River Site, Set-aside #29 (N 33°22', W 81°31'), xeric scrub oak/pines, litter sifting, coll. M. Draney (MLD), 28 January 1996, 1♂; pitfalls, coll. M. Draney (MLD), 6–19 February 1996, 1♀; Timber compartment 30 (N 33°20', W 81°31'30"), loblolly pine forest and oak hickory uplands, leaf litter, extracted, coll. M. Draney, D. Sanzone (MLD), 4 November 1994, 2♀; litter sifting, coll. M. Draney (MLD), 13 January 1995, 2♂ 3♀; leaf litter, extracted, coll. M. Draney, D. Sanzone (MLD), 20 February 1995, 2♀; pitfalls, coll. M. Draney (MLD), 11–28 December 1995, 2♂; 28 December 1995–8 January 1996, 1♂; 8–22 January 1996, 6♂; 22 January–6 February 1996, 12♂ 1♀; 6–19 February 1996, 2♂; 4–18 March 1996, 2♂ 1♀; litter sifting, coll. M. Draney (MLD), 12 December 1996, 1♂ 3♀; litter sifting, coll. M. Ulyshen (MLD), 17 January 2003, 8♂; pitfalls, coll. M. Ulyshen (MLD), 12 January 2004, 22♂; Timber compartment 54 (N 33°19', W 81°30'), loblolly pine forest, pitfalls, coll. M. Ulyshen (MLD), 12 January 2004, 8♂; Timber compartment 55 (N 33°19', W 81°30'), loblolly pine forest, pitfalls, coll. M. Ulyshen (MLD), 12 January 2004, 15♂; Carolina Bay #80 "Buttress Bay" (N 33°17', W 81°29'15"), deciduous leaf litter near shore, litter sifting, coll. M. Draney (MLD), 28 October 1994, 1♂ 1♀; McCormick County, Hamilton Branch State Park (N 33°45', W 82°13'), litter, coll. M. Draney (MLD), 13 November 1993, 2 ♀. *Virginia*: Isle of Wight County, Blackwater Ecological Preserve, pitfalls, coll. M. Milne (MAM), 19 January 2006, 6♂; 25 January 2009, 1♂.

## Discussion

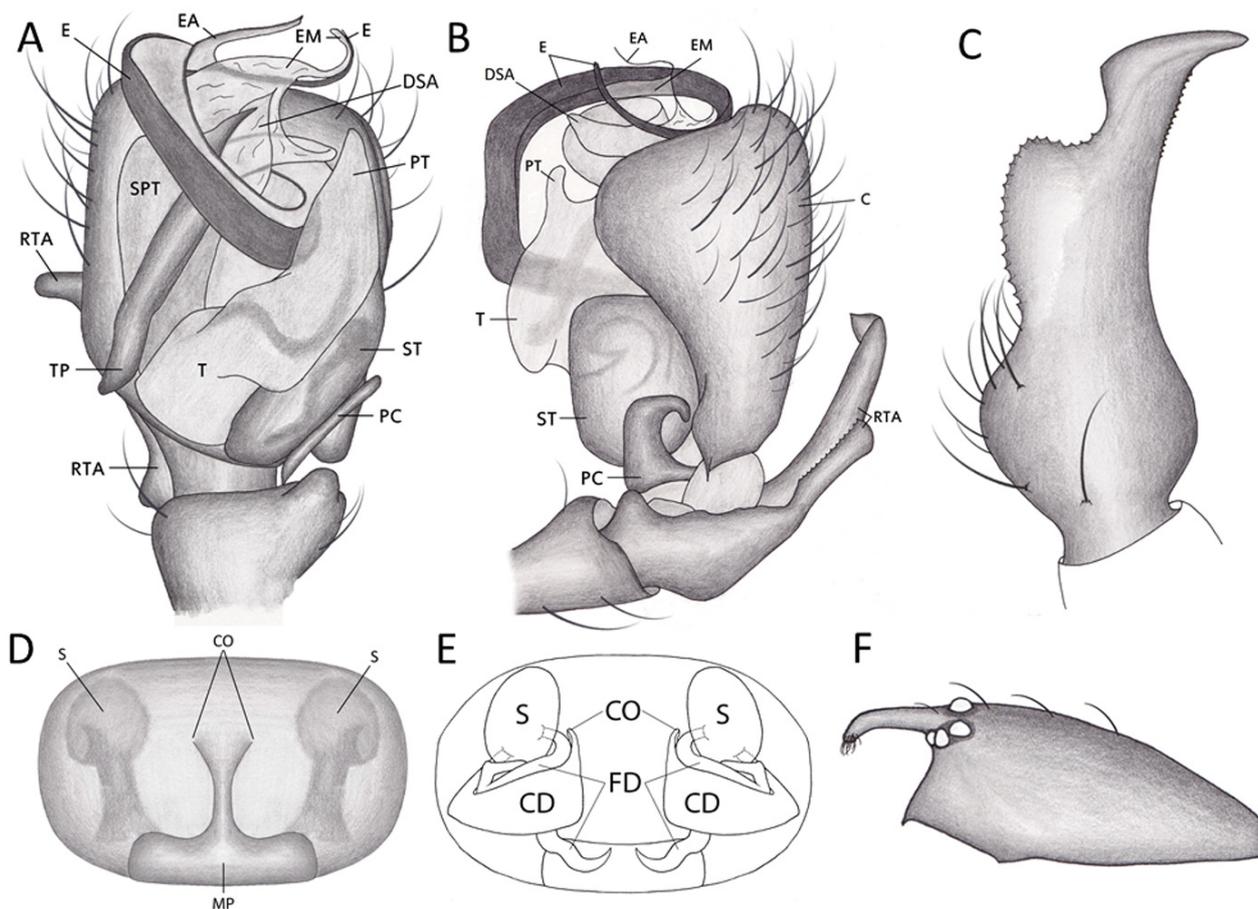
The genus *Epiceraticelus* can be placed in the subfamily Erigoninae by lacking dorsal spines on tibia IV, lacking a prolateral spine on femur I, and possessing a retrolateral palpal tibial apophysis. Historically, this previously monotypic genus was diagnosed by the male possessing a retrolateral tibial apophysis that "appears as 2 appressed projections in dorsal view" (Ubick *et al.* 2017). However, with the addition of *E. mandyae* **n. sp.**, this diagnosis is no longer valid because *E. mandyae* **n. sp.** males do not appear as such. We now believe that this new species belongs in *Epiceraticelus* due to certain morphological similarities. Specifically, both species (*E. mandyae* **n. sp.** and *E. fluvialis*) are



**FIGURE 4.** SEM micrographs of *Epiceraticelus mandyae* n. sp.: A, Male habitus. B, Ventral view of male left palp. C, Retro-lateral view of tibial apophysis of male left palp. D, Dorsal view of epigynum, cleared. E, Ventral view of epigynum. Abbreviations: E, embolus; EA, embolic apophysis; EM, embolic membrane; PC, paracymbium; RTA, retrolateral tibial apophysis; T, tegulum; TP, tailpiece; S, spermathecae; CD, copulatory duct; CO, copulatory opening; MP, median plate. Scale bars, A, 0.5 mm; B, 0.1 mm; C, D, E, 0.05 mm.



**FIGURE 5.** SEM micrographs of *Epiceraticelus mandyae* n. sp.: A, Lateral view of male carapace. B, Lateral view of male carapace projection—arrows indicate pores. Scale bars, A, 0.2 mm; B, 0.02 mm.



**FIGURE 6.** Free hand illustrations of *Epiceraticelus mandyae* n. sp. (proportions are approximate). A, Male left palp, ventral view. B, Male left palp, retrolateral view. C, Retrolateral view of tibial apophysis of left palp of male. D, Ventral view of epigynum. E, Dorsal schematic of epigynum. F, Lateral view of male carapace. Abbreviations: C, cymbium; CD, copulatory duct; CO, copulatory opening; DSA, distal suprategular apophysis; E, embolus; EA, embolic apophysis; EM, embolic membrane; FD, fertilization duct; MP, median plate; PC, paracymbium; PT, protégulum; RTA, retrolateral tibial apophysis; S, spermathecae; SPT, suprategulum; ST, subtegulum; T, tegulum; TP, tailpiece.

small with reduced spination. Both males possess a palp that consists of a long sinuous embolic division that circles around the distal end (Figs. 2B, 3A, 4B, 6A) along with a long tibial apophysis that includes fine serrations on the medial side (Figs. 2A, 3C, 4C, 6C). In both species the epigynum has a medial piece with a wide posterior plate and copulatory openings near the midline between the spermathecae (Figs. 2C–D, 3E–F, 4D–E, 6D–E).

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