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# A new species of *Hadrobunus* (Opiliones: Sclerosomatidae: Leiobuninae) from the southeastern United States

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**Abstract.** A new species of harvestman from the endemic North American genus *Hadrobunus* Banks, 1900 is described. The species, *H. fusiformis*, differs substantially from known USA species in both somatic and genital morphology, but the male resembles that of *H. knighti* from northern Mexico in having a long, narrow penis and posteriorly tapered opisthosoma.

**Keywords:** Harvestmen, systematics, taxonomy

The genus *Hadrobunus* Banks 1900 is traditionally distinguished from other New World Leiobuninae by relatively short legs (i.e., femur I shorter than length of body) and minute, posteriorly curved (retrorse) spinules or acuminate to spinulate tubercles distributed on the dorsum, especially the scutum (Figs. 1, 2, 9, 11). Taxonomists have heretofore recognized four species. *Hadrobunus grandis* (Say 1921) and *H. maculosus* (Wood 1868) occur in the eastern United States, with *H. maculosus* ranging into southeastern Canada. Two species, *H. davisi* Goodnight & Goodnight 1942 and *H. knighti* Goodnight & Goodnight 1942, occur in Mexico. The two northern species have large bodies and robust legs as well as highly derived penes (Fig. 3) and female genital opercula (Fig. 4). They are now most often distinguished by ambiguous and somewhat arbitrary (largely geographic) criteria offered by Bishop (1949), and it is possible that current concepts of the two species are artifacts of taxonomic history. Indeed, Say probably described *Phalangium grandis* from material obtained during his 1817–1818 expedition to northeastern Florida and coastal Georgia (Bennet 2002), but the types were lost over 140 years ago. Consequently, all subsequent discussion of the species has occurred without clear knowledge of its type locality or details of its morphology, although it is generally assumed to be similar to *H. maculosus*. The Mexican species are distinct from one another and from the northern species, but each is known from one individual. *Hadrobunus davisi* is known from the female holotype. It is small (3.9 mm long), with very well-developed retrorse spination and an unremarkable genital operculum (Fig. 8). *Hadrobunus knighti* is known from the male holotype (female specimens appear to have been lost). It is large (8.3 mm long), with a long, sacculate penis (Fig. 7) similar to that of many other Leiobuninae.

While visiting the collection at the Academy of Natural Sciences in Philadelphia in 2007, I found a vial containing three specimens (two males and one female) representing an undescribed species of *Hadrobunus* from the mountains of western North Carolina. Subsequent examination of other collections revealed that the late Norman W. Davis (b.1905 - d. 1969) had recognized the species as new based on material collected in September 1930 by Theodore H. Hubbell. Davis never published his findings, although he labeled the specimens ''*Hadrobunus fusiformis* Davis'' and designated them all as ''paratypes.'' They are now part of the ''Cornell Collection'' at the American Museum of Natural History. The new species differs substantially from its congeners in the United States and Canada, but is very similar to the Mexican *H. knighti* in both general body form and basic construction of the penis (Fig. 5), although the penis of the new species lacks the subterminal sacs of *H. knighti* (Fig. 7). Consequently, *Hadrobunus fusiformis* is an important addition to the harvestman fauna of eastern North America.

## METHODS

All observations were conducted using a Leica MZ APO dissecting microscope (16× ocular, 0.63× objective, 8–80× zoom). Pencil drawings were made using a drawing tube, digitally scanned, and then traced and finished using Adobe Illustrator CS2 software.

The specimens examined for this study are lodged in the following depositories: Academy of Natural Sciences, Philadelphia (ANSP); American Museum of Natural History, New York (AMNH); Florida State Collection of Arthropods, Gainesville (FSCA); National Museum of Natural History (Smithsonian Institution), Washington D.C. (NMNH); North Carolina Museum of Natural Sciences, Raleigh (NCMNS); Texas Tech University Museum, Lubbock (TTUM); University of Maryland, J.W. Shultz Collection (UMD); and Virginia Museum of Natural History, Martinsville (VMNH).

**Material examined.**—*Hadrobunus maculosus:* USA: *Maryland*: Prince Georges Co., many ♂, many ♀, Beltsville, USDA Research Farm, 39.0244°N, 76.8987°W, 7 September 2006, L. Moore (UMD); Garrett Co., many ♂, many ♀, 6 km NW Westernport, COHO2 Managed Oak Forest, elev. 559 m, 39.508°N, 79.110°W, 12–19 August 2005, L. Morgens et al. (UMD). *Massachusetts*: Middlesex Co., 1 ♂, Groton, 42.6112°N, 71.5745°W, 18 August 1967, Chickering (MCZ 37037); 1 ♂, Lincoln, 42.4258°N, 71.3044°W, 27 July 1967, Chickering (MCZ 37035); 1 ♂, Pepperell 42.6658°N, 71.5889°W, August 1968, H. & L. Levi (MCZ 36347), 1 ♂, Pepperell, August 1963, H. Levi (MCZ 36345); 1 ♂, Pepperell, 27 August 1963, L. Levi (MCZ 36344); 1 ♂, Pepperell, June 1966, H.W. Levi (MCZ 36352); 1 ♀, Pepperell, August 1966, H.W. Levi (MCZ 36356); 1 ♂, 1 ♀, Sherborn, 42.2389°N, 71.3703°W, August [no year], A.P. Morse (MCZ 38518). *New York*: Dutchess Co., 2 ♀, Poughkeepsie, 41.7064°N, 73.9208°W, no date, no coll. (MCZ 36354). *North Carolina*:


Figures 1–2.—*Hadrobunus fusiformis* new species, dorsal perspectives: 1. Male (North Carolina, Buncomb Co., 8 km west of Ashville); 2. Female (North Carolina, Jackson Co., Pathertown Valley). Scale bar = 1 mm.

Alamance Co., 1 ♀, Burlington, 36.0897°N, 79.4455°W, 19 September 1935, HKW (MCZ 37144). *Pennsylvania*: Bucks Co., 1 ♀, Rushland, Wilkenson Road, Coyne Farm, vernal marsh on wooded hilltop, ex. Malaise trap, site 1, 40.2503°N, 75.0417°W, 21 July–5 August 1998, H. O'Connor (ANSP); 3 ♂, Rushland, Wilkenson Road, Coyne Farm, vernal marsh on wooded hilltop, ex. Malaise trap, site #1, 40.2503°N, 75.0417°W, 6–20 August 1998, H. O'Connor (ANSP). *Virginia*: Botetourt Co., many ♂, many ♀, Roaring Run, pitfall, 37.3923°N, 79.4157°W, 30 June 1996, M. Donahue & B. Hogan (VMNH). Augusta Co., many ♂, many ♀, George Washington National Forest, ~ 5 mi [~ 8 km] W of Stokesville, Comp. 460-3, Trap 3, 38.3606°N, 79.2589°W, 1 September 1989, B. Flamm (VMNH). *West Virginia*: Berkeley Co., many ♂, many ♀ (in many separate vials), Sleepy Creek Hunt & Fish Area, Third Hill Mtn., oak-pine forest, pitfall, 39.4387°N, 78.1944°W, many dates in 1985, P.J. Martinson (NMNH). Fluvanna Co., 5 ♂, 4 ♀, Kents Store, Bell drift fence site, 37.8793°N, 78.1289°W, 13 September 1995, M. Bell (VMNH).

*Hadrobunus davisi:* MEXICO: *Guerrero*: ♀ holotype, Acapulco, 16.87°N, 99.9°W, 17 June 1936, L.I. Davis (AMNH).

*Hadrobunus knighti:* MEXICO: *Nuevo León*: ♂ holotype, Villa de Santiago, Hacienda Vista Hermosa, Horsetail Falls [= Cascada Cola de Caballo], 25.3850°N, 100.1612°W, elev. 2500 ft [= 762 m], 16 June 1940, K. Knight (AMNH).

## TAXONOMY

Family Sclerosomatidae Simon 1879
Subfamily Leiobuninae Banks 1893
*Hadrobunus* Banks 1900

*Hadrobunus* Banks 1900:199.

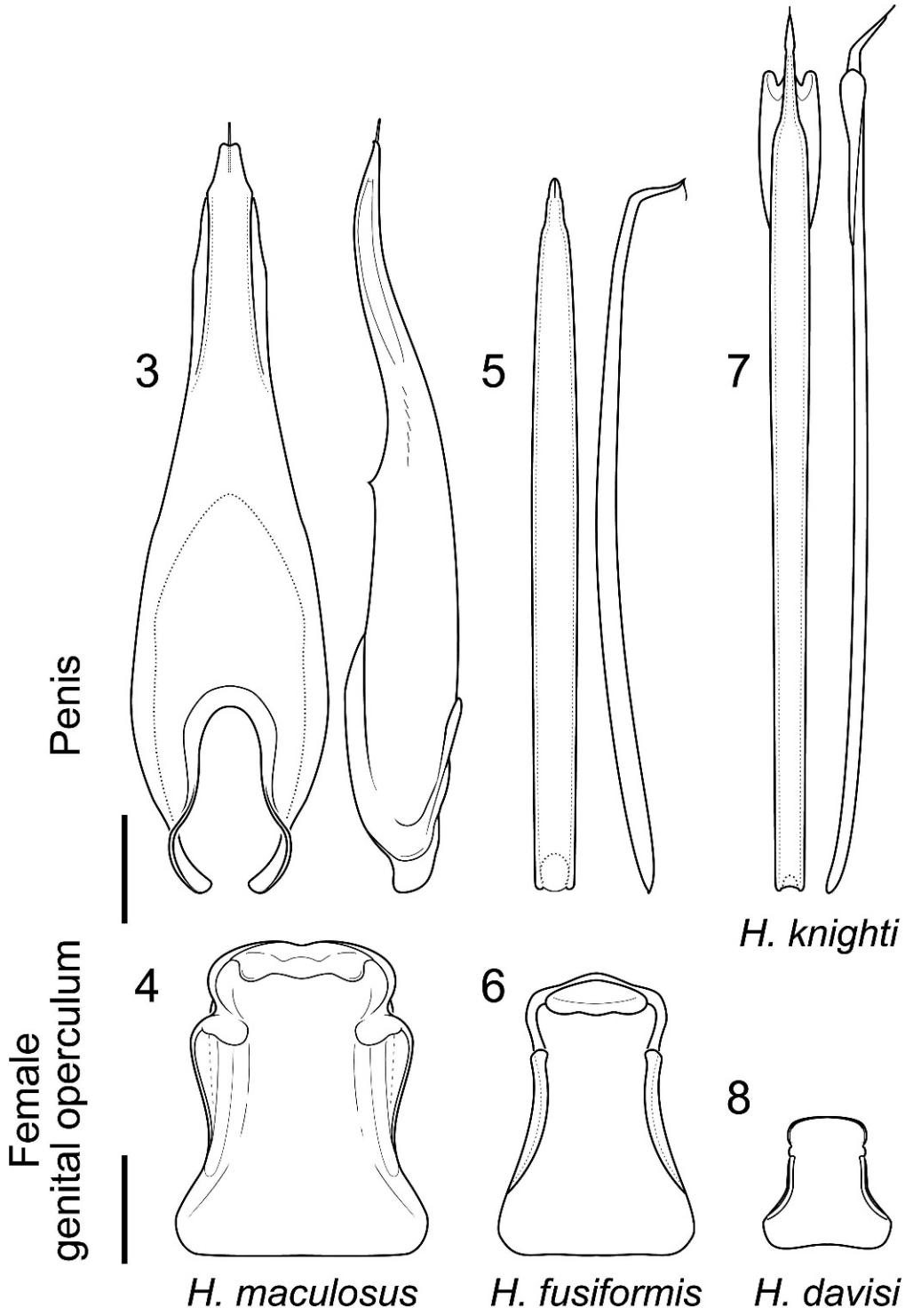
**Type species.**—*Phalangium grandis* Say 1821, by subsequent designation (Banks 1900).

**Diagnosis.**—Dorsum with minute, posteriorly curved (retrorse) spinules or acuminate to spinulate tubercles, especially numerous on propeltidium (especially on margins), meso- and metapeltidia and anterior tergal bands of scutum. Legs relatively short: femur I subequal to length of body or shorter. Ocularium weakly canaliculate or not canaliculate; each carina with a row of denticles. Retrolateral row of denticles absent or much reduced on coxa III.

***Hadrobunus fusiformis*** new species
Figs. 1, 2, 5, 6, 9–16

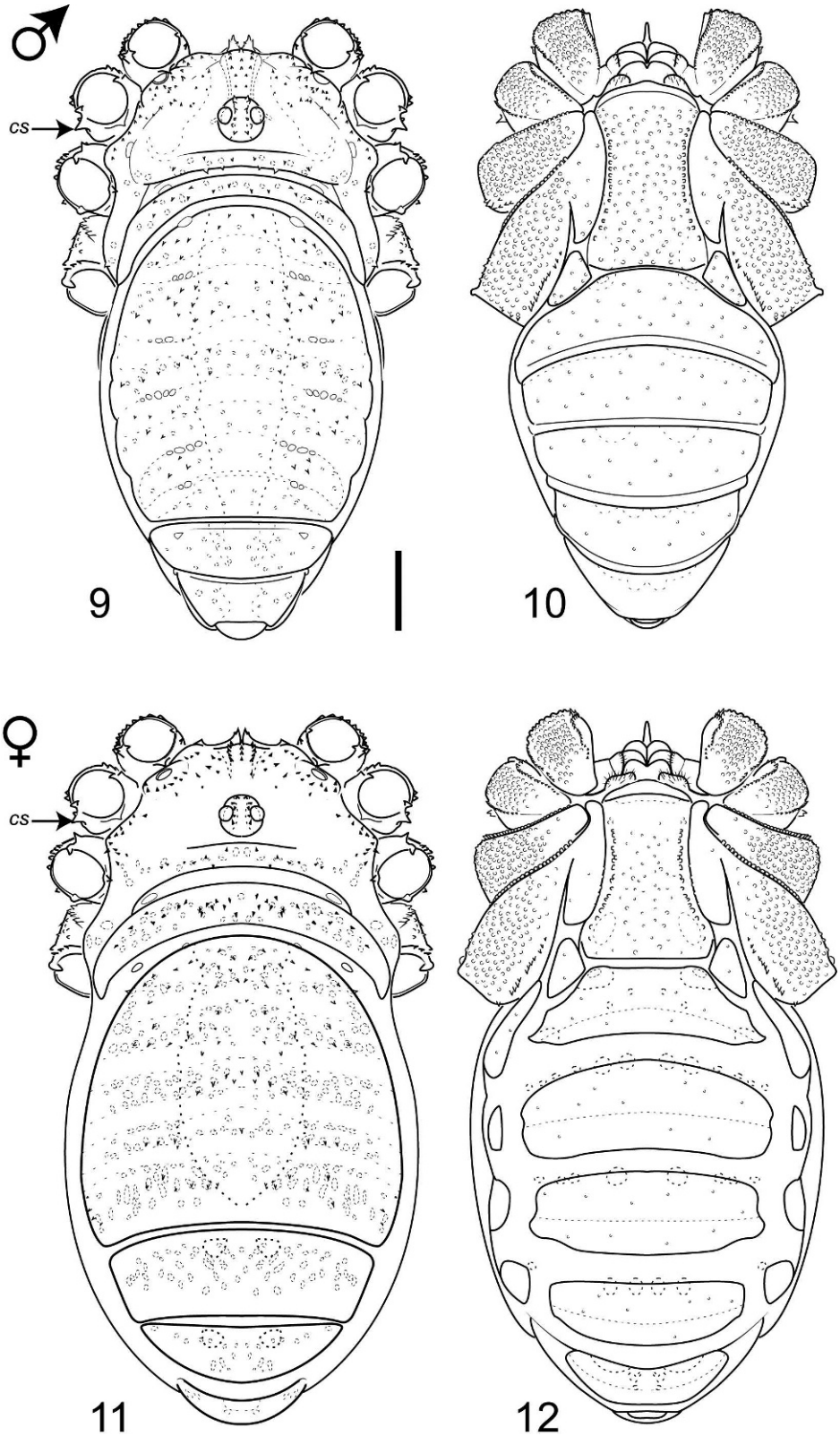
**Types.**—USA: *North Carolina*: Swain Co., ♂ holotype, Smokemont, Great Smoky Mountains National Park, 35.5141°N, 83.3024°W, 5 August 1939, Rehn & Rehn (ANSP). Paratypes: 1 ♀, same data as holotype (ANSP), 1 ♂, same data as the holotype (NMNH).

**Other material examined.**—*Georgia*: Camden Co., 6 ♂, 2 ♀, 30.92°N, 81.64°W [estimated from county center], 25 Septem-

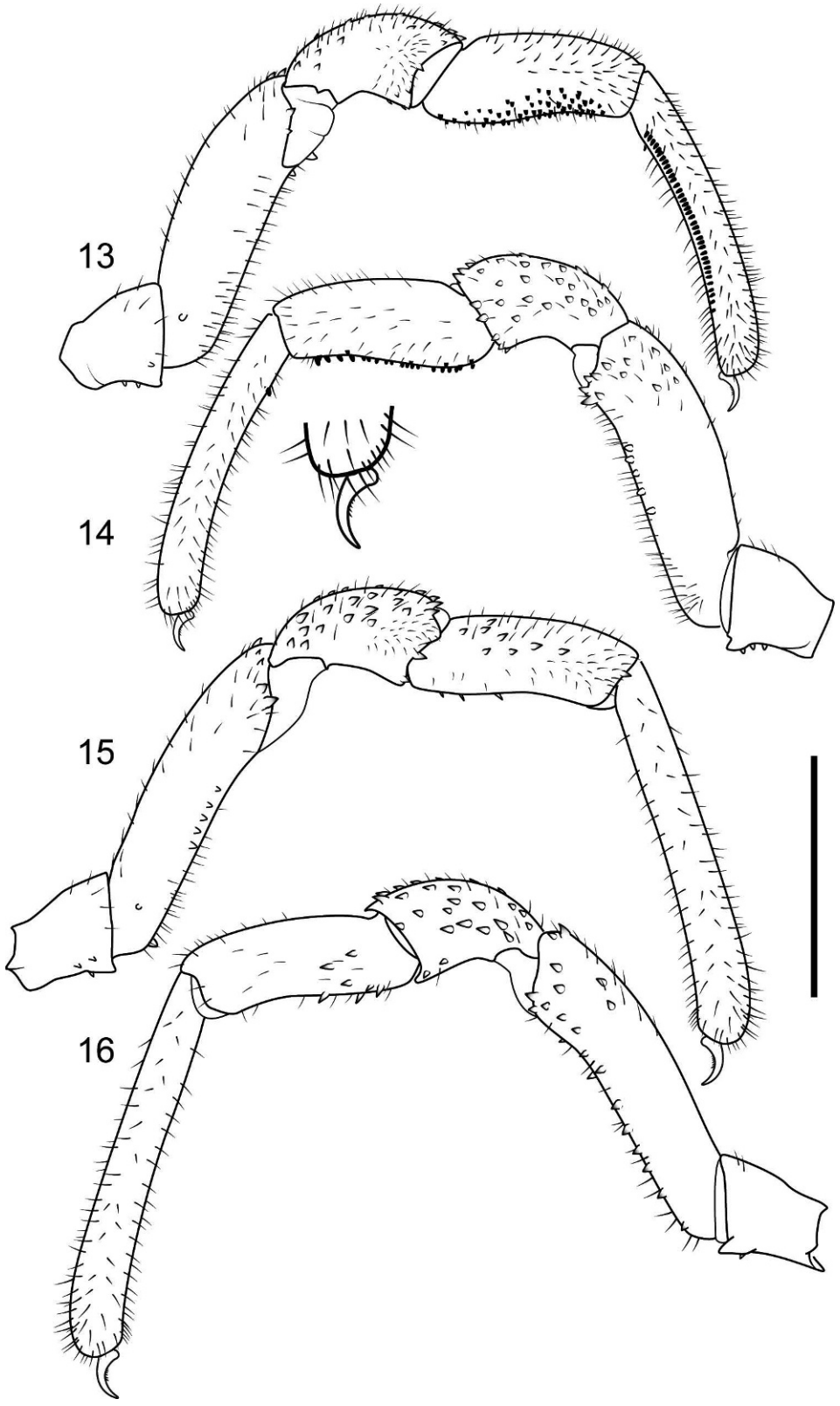



Figures 3–8.—Comparison of genital structures of known species of *Hadrobunus*. Penes illustrated with dorsal perspective on left and lateral perspective on right, with right side of lateral view corresponding to dorsal surface. Female genital opercula from internal (dorsal) perspective; flexible inner cuticle and sheath of ovipositor removed. All figures to same scale. Scale bars = 1 mm.

ber 1930, T.H. Hubbell [vial labeled "PARATYPE: *Hadrobunus fusiformis* Davis" by N.W. Davis] (AMNH). Habersham or Ruben Co., 1 ♂, Tallullah Falls, 34.7368°N, 83.3751°W, 30 July 1909, J.C. Bradley [vial labeled "PARATYPE: *Hadrobunus fusiformis* Davis" by N.W. Davis] (AMNH). Liberty Co., 2 ♂, 1 ♀, Midway, 31.8058°N, 81.4307°W, 30 September 1930, T.H. Hubbell [3 vials labeled "PARATYPE: *Hadrobunus fusiformis* Davis" by N.W. Davis] (AMNH). *North Carolina*: Buncomb Co., 1 ♂, 5 mi [8 km] W Ashville, Rte. 23/19, vacant lot, 35.5345°N, 82.7106°W, 17 July 1961, S & D Mulaik (AMNH). Buncomb or Haywood Co., 1 ♂, 1 ♀, Mount Pisgah, elev. 4000–5000 ft [1219–1524 m],




Figures 9–12.—*Hadrobunus fusiformis* new species: 9. Male holotype, dorsal view; 10. Male holotype, ventral view (setae not depicted); 11. Female paratype, dorsal view; 12. Female paratype, ventral view (setae not depicted). Abbreviation: *cs*, coxal spur. All figures to same scale. Scale bar = 1 mm.




Figures 13–16.—*Hadrobunus fusiformis* new species, left palps (recumbent microsetae not depicted): 13. Male holotype, prolateral view; 14. Male holotype, retrolateral view; inset (2×) showing armament of claw; 15. Female paratype, prolateral view; 16. Female paratype, retrolateral view. All figures to same scale. Scale bar = 1 mm.

under rocks, 35.4255°N, 82.7569°W, 5 July 1959, P. Weems (FSCA), 11 ♂, 4 ♀, H.V. Weems, Jr. [2 vials] (FSCA). Jackson Co., 1 ♂, Gribble Gap, 35.3079°N, 83.2082°W, ? July 1971, F. Coyle (TTUM: TTU-Z 58,766); 1 ♀, Pathertown Valley, 35.3265°N, 83.1220°W, 7 August 2000, J.C. Cokendolpher (TTUM: TTU-Z 58,679). Macon Co., 2 ♀ penult., Coweeta Hydrologic Station, 35.0596°N, 83.4205°W, 30 June 1978, L. Reynolds (NCMNS A6976); 1 ♂, 1♀, 15 August 1977 (NCMNS: A6811); 4 ♂, 18 August 1978 (NCMNS: A6904 & A6905); 1 ♀, 22 August 1977 (NCMNS: A6855); 1 ♀, 25 August 1977 (NCMNS: A7259), 1 ♀, 8 September 1978 (NCMNS: A7240); 2 ♂, 15 September 1978 (NCMNS: A6948 & 6944); 1 ♀, 22 September 1977 (NCMNS: A6865). Transylvania Co., 1 ♂, 3.2 mi [5.1 km] NNW Brevard, US 276, 4.9 mi [7.9 km] N US 64, 35.3098°N, 82.6161°W, 29 August 1973, R.W. Shelley (NCMNS: 1981). *South Carolina*: Aiken Co., 1 ♂, 1 ♀, 15 mi [24 km] SW Aiken, 33.4051°N, 81.8901°W, 15 September 1983, L. Robbins (TTUM: TTU-Z 58,808); 11 ♂, 23 ♀. Beaufort Co., Hardeeville, 32.2871°N, 81.0807°W, 29 September 1930, T.H. Hubbell [3 vials labeled "PARATYPE: *Hadrobunus fusiformis* Davis" by N.W. Davis] (AMNH). Colleton Co., 19, 22, Round O, 32.9396°N, 80.5441°W, elev. 11 m, 29 Sept. 1930, T.H. Hubbell [7 vials labeled "PARATYPE: *Hadrobunus fusiformis* Davis" by N.W. Davis] (AMNH).

**Etymology.**—The late Norman W. Davis recognized the species described here as new, but he did not publish a description. Davis used the specific epithet *fusiformis* on his labels, a name that acknowledges the unusual fusiform shape of the male body. Davis's name is retained here.

**Diagnosis.**—Penis long (87% body length), linear, simple, without sacs, dorsoventrally compressed throughout; intrinsic penial muscle pinnate, with short fibers attaching along full length of shaft (Fig. 5). Posterior end of male opisthosoma extended, somewhat pointed, giving the body a fusiform appearance (Figs. 1, 9, 10). Male palpal tibia with broad field of dark peg-like spines on ventral and proventral surfaces (Figs. 13, 14). Male scutum with six tergites (Figs. 1, 9). Female genital operculum (Fig. 6) with large, heavily sclerotized anterior sclerite, lateral apodeme lacking anterior apophysis of female *H. maculosus* (Fig. 4).

**Description.**—*Male (holotype):* Body length, 7.4 mm; max. carapace width, 3.5 mm.

*Dorsum* (Figs. 1, 9): Cuticle finely granulate. Propeltidium with low, marginal preocular mound bearing one median and two lateral longitudinal rows of four or six sharp, conical spinules; rows extending more than halfway to ocularium. Marginal and submarginal regions of propeltidium, including mound of ozopore, with scattered sharp, dark, curved spinules. Supracheliceral lamina with pointed, divergent processes, each with two lateral spinules. Ocularium not canaliculate, each carina with highly irregular row of variably developed denticles (seven on the right, five on the left). Mesopeltidium with a few small, curved, dark spinules. Metapeltidium with scattered dark spinules and a few tubercles, tubercles concentrated laterally. Opisthosomal scutum composed of six fused tergites. Scutum and two free tergites with scattered small, dark, recurved spinules and rounded tubercles, some tubercles bearing spinules. Spinules most densely distributed on first two and last scutal tergites.

*Venter* (Fig. 10): Cuticle finely granulate. Lateral surfaces of coxae I–IV covered in low, rounded, circular tubercles, interspersed with erect macrosetae. Coxal denticles terminating in either a flat blade, a single median point or three points (large median point subtended by smaller point on either side). Long, well-defined rows of well-developed denticles present on prolateral surfaces of coxa I–IV and retrolateral surface of coxa IV. Row of denticles and/or denticle-like tubercles on retrolateral surface of coxa I, extending from distal end proximally three-fourths the length of the coxa. Row of conical tubercles on retrolateral surface of coxa II running from distal end proximally about half the length of the coxa. Retrolateral surface of coxa III without row of denticles or modified tubercles. Coxa I with retrolateral distal coxal spur (specialized denticle or denticles dorsal to coxa-trochanter articulation) consisting of one large point; coxa II with retrolateral distal spur with one large and one small point (Fig. 9: *cs*); coxa III without spurs but with prolateral prominence bearing last two slightly enlarged denticles of the prolateral row; comparable structure evident on coxa IV but not as well developed. Labrum simple, thin, elongate; terminus pointed.

Genital operculum: Broad, transversely convex; surface with low, rounded tubercles; scattered erect setae, especially anteriorly; laterally with submarginal, imperfect row of denticles; anterior margin rebordered, lip narrow, with slight anterior projection, lacking large, dark sclerite present in female.

Sternites: Finely granulate with scattered, low, rounded tubercles and fine, erect setae. Lateral portions of sternites completely or partly separated by thin line of flexible cuticle forming pleurites.

Chelicerae: Smooth except for erect macrosetae on dorsal surfaces of first and second articles, with cluster at base of fixed finger; short, peg-like spine projecting medially from base of fixed finger just distal to setal cluster.

Palps (Figs. 13, 14): Measurements (in mm): femur, 1.5; patella, 0.8; tibia, 1.0; tarsus, 1.6. Trochanter with a few scattered, erect setae dorsally and ventrally; distal retroventral apophysis robust, conical; several stout, sharp-tipped spines on and around apophysis. Femur with longitudinal series of stout conical spines along middle third of retroventral surface; distal retrolateral surface with cluster of large, thorn-like spines. Ventral surface with numerous erect setae and two small, stout spines. Dorsal surface with an imperfect prolateral longitudinal row of erect setae; distal one-fourth of dorsal surface with scattered erect setae and thorn-like spines, spines tending to be larger distally. Retrolateral surface largely smooth, with a few scattered setae; one proximal dark tubercle; two thorn-like spines at distal margin. Patella with large thorn-like spines on dorsal and retrolateral surfaces and distal prolateral margin, spines interspersed with scattered erect macrosetae; prolateral and ventral surfaces without spines but with erect macrosetae. Tibia with scattered erect macrosetae on most of surface (absent on proximo-prolateral surface); coat of distally recumbent microsetae present dorsally; ventral and proventral surface covered in short, dark, peg-like spines. Tarsus coated in distally recumbent microsetae and scattered macrosetae; proventral surface with file of 37 peg-like spines; proximal retroventral surface with

single peg-like spine. Claw with ventral series of five small teeth increasing in length distally.

Legs: Measurements of femur, patella, tibia, basitarsus and telotarsus (in mm): I: 4.6, 1.3, 3.7, 4.6, 6.7; II: 7.7, 1.5, 6.6, 6.9, 12.5; III: 4.8, 1.4, 3.5, 5.3, 6.5; IV: 7.3, 1.5, 5.2, 8.7, 8.9. Trochanters with compressed thorn-like spines on pro- and retrolateral surfaces, a few smooth tubercles on pro- and retrodorsal surfaces; dorsal and ventral surfaces essentially smooth. Femora proximal to annular constriction with small thorn-like spines dorsally and small tubercles ventrally; shaft with numerous distally pointing, thorn-like spinules grading from larger dorsally to minute ventrally. Similar thorn-like spinules on patellae and tibiae; tibial spinules decreasing in size and density distally; basitarsus IV with a few spinules on proximal dorsal surface. Tibiae, basitarsi, and telotarsi coated with recumbent microsetae, increasing in density distally. Basi- and telotarsi with scattered erect setae, increasing in length and density distally.

Penis (Fig. 5): Length, 6.5 mm. Shaft dorsoventrally flattened over most of length, slightly inflated proximally; well sclerotized, smooth; no sacs, bulbs, or alae. Glans held at about 100 degree angle to shaft, dorsoventrally flattened, tapering distally in lateral perspective, rounded terminus in dorsal perspective; two pairs of small, procurved spines projecting from lateral margin; stylus sinuate, angled posteriorly, arising from superior terminal margin of glans.

Coloration: From specimen stored over 70 years in ethanol; cuticle darkened and contrast reduced. Dorsum with dark brown background. Propeltidium with some light brown mottling, lateral margins darker; a few light spots on posterolateral surface. Light stripe arising anteriorly on each side of preocular mound, passing posteriorly and converging slightly toward midline but diverging from midline halfway to ocularium, continuing laterally to end at ocularium. Ocularium very dark brown basally, with light median band dorsally. Meso- and metapeltidium with imperfect transverse rows of light spots; cuticle darker medially than laterally, appearing as continuation of median scutal band. Opisthosomal scutum with dark median band (''saddle''); gradually broadening posteriorly, reaching greatest width on fourth scutal tergite, then narrowing gradually to the end of scutum, trace of saddle evident on first free opisthosomal tergite; no large, paired, dark spots as in female. Opisthosomal scutum crossed by six transverse bands of light spots separated by bands without spots; spots not as distinct as in female, nor arranged in small stripes on posterior part of scutum. Free tergites with a few light spots, especially laterally.

Venter: Pedal coxae broadly mottled with light and dark brown. Genital operculum light yellow-brown, brown at postero-lateral surface. Postgenital sternites uniformly brown, anterior margin of each sternite with bilaterally symmetrical band or row of dark brown spots indicating muscle attachments. Soft conjunctival cuticle light yellow-brown.

Chelicerae. Uniformly yellow-brown with darker chelal fingers.

Palps. Trochanter and proximal half of femur yellow-brown. Patella and distal portion of femur brown. Tibia light brown proximally, lightening distally. Tarsus yellow-brown.

Legs. Trochanters light brown on dorsal and ventral surfaces but dark on prolateral and retrolateral surfaces. Femora dark proximal to basal circumfemoral constriction, a light band just distal to constriction; remainder of femur brown. Patellae mottled with white and dark brown dorsally, homogenously light brown ventrally. Tibiae light brown proximally, brown distally with both darker and lighter mottling. Basitarsi and telotarsi yellow-brown, except for darker band at base of basitarsus and at articulations.

*Female (paratype):* Body length, 9.4 mm; max. carapace width, 3.9 mm.

Dorsum (Figs. 2, 11): Cuticle finely granulate. Propeltidium with low, marginal preocular mound bearing one median and two lateral longitudinal rows of four to six sharp spinules; rows extending less than halfway to ocularium. Marginal and submarginal regions of propeltidium, including mound of ozopore, with scattered sharp, dark, curved spinules. Anterior projections of supracheliceral lamina pointed, not diverging, with one or two lateral spinules. Ocularium not canaliculate, each carina with regular row of stout, curved denticles (five on the left, four on the right). Mesopeltidium with a few small, dark, curved spinules, separated from metapeltidium by wide band of conjuctival cuticle. Metapeltidium with scattered dark, curved spinules and a few tubercles, the latter concentrated laterally. Opisthosomal scutum composed of five fused tergites. Scutum and three free tergites of opisthosoma with scattered small, dark, recurved spinules. Spinules most densely distributed on anterior scutal tergites.

Venter (Fig. 12): Cuticle finely granulate. Lateral surfaces of coxae I–IV covered in low, rounded, circular tubercles, interspersed with erect setae. Well-defined rows of well-developed denticles present on prolateral surfaces of coxae I–IV and retrolateral surface of coxa IV. Denticles absent on retrolateral surface of coxae I and II, although marginal retrolateral tubercles larger and sharper, forming apparent row extending along distal half of coxa; marginal retrolateral tubercles on coxa II less developed than on coxa I. Retrolateral surface of coxa III without denticles or retrolateral row of modified marginal tubercles. Coxa I with retrolateral coxal spur consisting of one large point; coxa II with retrolateral spur with one large and one small point; coxa III without spurs but with prolateral prominence bearing last two slightly enlarged denticles of the prolateral row; comparable structure evident on coxa IV but not as well developed. Labrum simple, thin, elongate.

Genital operculum (Fig. 12): Covered externally with low, rounded tubercles; laterally with submarginal, imperfect row of denticles. Anterior margin rebordered, forming wide lip with slight anterior projection; submarginal sulcus well developed, darkened. Inner (dorsal) anterior surface with large, dark, smooth, reniform sclerite (Fig. 6).

Supra-opercular sternum with anterior and posterior regions. Anterior region typical, formed by free, transverse sclerite projecting anteroventrally just posterior to labium; distal free margin procurved with thin lateral projections bracing posterior surface of coxapophysis II. Posterior part heavily sclerotized, projecting posteriorly as part of dorsal wall of pregenital chamber, apparently fitting into corresponding parts of opercular sclerite. Sternites finely granulate, free lateral portions forming subrectangular pleurites, widely separated from sternites by flexible cuticle.

Chelicerae: Smooth except for erect setae on dorsal surfaces of first and second segments, with cluster at base of fixed finger.

Palps (Figs. 15, 16): Measurements (in mm): Femur, 1.6; patella, 0.8; tibia, 1.0; tarsus, 1.6. Trochanter with simple conical, disto-ventral apophysis and three short, stout ventral spines. Femur with longitudinal series of stout conical spines on retroventral surface interspersed with erect setae; spines shorter, more robust proximally. Dorsal surface with one or two imperfect longitudinal rows of setae; disto-dorsal, prolateral and retrolateral surfaces with small, low thorn-like spines, broad basally with sharp, black distal tip. Proventral surface with row of five short spines and one proximal tubercle. Patella with large thorn-like spines on dorsal and retrolateral surfaces and distal prolateral margin, spines interspersed with scattered erect setae; prolateral and ventral surfaces without spines but with erect setae; setae particularly dense on distal prolateral prominence (reduced patellar apophysis). Tibia with a longitudinal prolateral series of spines, more spines proximally but terminating with large distally projecting spine at terminal margin; a few spines along retroventral surface and proximally on retrolateral surface; otherwise with distally recumbent microsetae and erect macrosetae. Tarsus without spines, covered in micro- and macrosetae. Claw with ventral series of five teeth increasing in length distally.

Legs: Measurements of femur, patella, tibia, basitarsus, telotarsus (in mm): I: 4.5, 1.3, 3.4, 4.5, 6.4; II: 7.4, 1.5, 3.8, 4.8, 14.3; III: 4.7, 1.5, 3.8, 4.8, 6.3; IV: 7.5, 1.6, 5.2, 8.7, 9.6. Trochanters with compressed thorn-like denticles on pro- and retrolateral surfaces, dorsal and ventral surfaces essentially smooth. Small spinules on femora, patellae and proximal tibiae.

Coloration: From specimen stored over 70 years in alcohol; cuticle likely darkened and contrast reduced. Dorsum with dark brown background. Propeltidium with some light brown mottling, lateral margins darker; a few light spots on posterolateral surface. Light stripe arising anteriorly on each side of preocular mound, passing posteriorly and converging toward midline but terminating before reaching ocularium. Ocularium dark around lenses; concolorous with propeltidium anteriorly and posteriorly; light median band dorsally. Meso- and metapeltidium with imperfect transverse rows of light spots. Scutum with dark median band (''saddle'') with lateral margins somewhat darker than center; broadens slightly posteriorly but narrows rapidly within last scutal tergite. Opisthosomal scutum crossed by five transverse bands of light spots separated by bands without spots; spots on last scutal tergite elongated or arranged longitudinally, giving the impression of many short stripes. First and second free tergites of opisthosoma with broad bands of small, elongated light spots anteriorly, no spots posteriorly; each tergite with large dark, irregular spot suggesting continuation of saddle. Last free tergite darker than preceding tergites, with light antero-median region and a few irregular light patches.

Venter. Pedal coxae broadly mottled with light and dark brown. Genital operculum light yellow-brown but brown within submarginal sulcus and at postero-lateral surface; internal marginal sclerite very dark brown. Postgenital sternites with brown and yellow-brown mottling but divided transversely into distinct anterior and posterior parts, with anterior being lighter than posterior. Anterior margin of each sternite with bilaterally symmetrical row of dark brown spots indicating muscle attachments. Pleural sclerites (detached lateral ends of sternites) without transverse separation as present in sternites but dark brown at lateral ends. Soft conjunctival cuticle light yellow-brown.

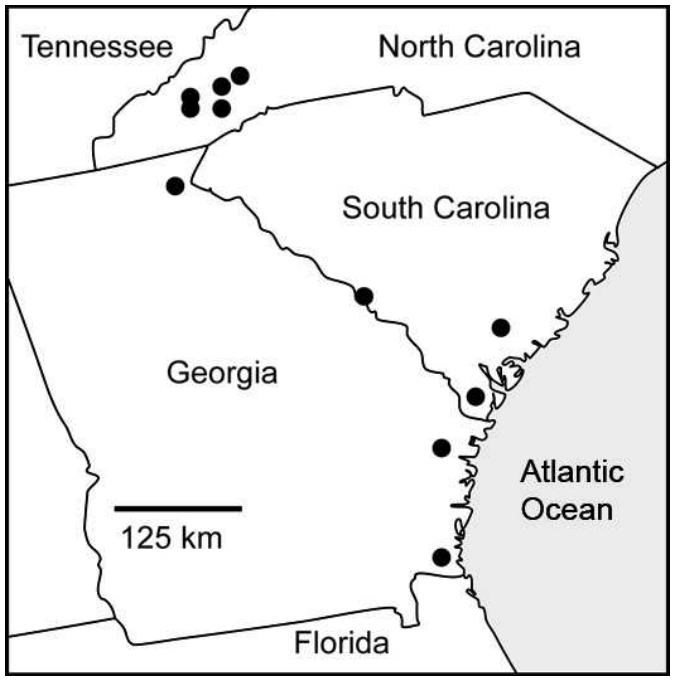



Figure 17.—Known collection sites for *H. fusiformis* new species.

Chelicerae. Uniformly yellow-brown with darker chelal fingers.

Palps. Trochanter uniformly light brown. Femur and patella with dark brown and light mottling on most surfaces but homogenously brown ventrally. Tibia light brown, homogeneous. Tarsus light yellow-brown, homogenous.

Legs. Trochanters concolorous with dorsum on dorsal and ventral surfaces but dark on prolateral and retrolateral surfaces. Femora dark proximal to basal circumfemoral constriction, a narrow light band just distal to constriction; remainder of femur brown though darker dorsally. Patellae mottled with white and dark brown dorsally, homogenously light brown ventrally. Tibiae with brown and whitish mottling dorsally, forming imperfect longitudinal stripes; more homogenous ventrally, without whitish component. Basitarsi and telotarsi yellow-brown, except for darker band at base of basitarsi and at articulations.

**Distribution.**—*Hadrobunus fusiformis* is known from the Blue Ridge Mountains of North Carolina and Georgia, near the Atlantic coast of South Carolina and Georgia and from one intermediate locality near Aiken, South Carolina (Fig. 17). This disjunct distribution is probably an artifact of sampling effort, and the species may occur widely in South Carolina and eastern Georgia.

## COMMENTS

The paucity of diagnostic characters for *Hadrobunus* and the significant genitalic diversity of its constituent species (Figs. 3–8) invites speculation about the validity of the genus. However, in the absence of a taxonomic revision informed by

phylogenetic analysis, it would be premature to conclude that *Hadrobunus* is poly- or paraphyletic or that it should be divided into multiple genera. Indeed, a recent survey of museums and other collections by the author has revealed at least 10 undescribed species of *Hadrobunus* from the eastern and central United States. The emerging spectrum of morphological diversity in *Hadrobunus* also encompasses several species currently placed in *Leiobunum*. A much clearer picture of the diversity and phylogeny of *Hadrobunus* is required before taxonomic rearrangements are warranted. However, even among the undescribed species of *Hadrobunus*, *H. fusiformis* is distinctive and appears to have a unique position close to the Mexican *H. knighti*.

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