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**Distribution of *Strongylium crenatum*
(Coleoptera: Tenebrionidae) in the United States
and first record from Iowa**

Edwin L. Freese¹

Abstract

Strongylium crenatum Mäklin (Coleoptera: Tenebrionidae) is reported from Iowa for the first time. After discovering that Iowa represented a large range extension for this species, label data were collected to update its range. Numerous insect collections and references were checked and specimens representing 17 states were located.

The first Iowa specimen of *Strongylium crenatum* Mäklin, 1864, was collected at Sharon Bluffs State Park, Appanoose County, on 21 July 2007 by Doug Veal using a combination UV-florescent light. The location in southern Iowa is about nine miles from the Missouri-Iowa border. The specimen was later identified by Charles Triplehorn, who indicated the specimen represented an interesting range extension of a rarely encountered species. Research of the internet and published sources confirmed that the distribution of this species was poorly known; this paper updates the known range of this beetle.

According to Triplehorn and Spilman (1973) "This species is found in the southeastern United States, reaching as far north as the Ohio River and as far west as Dallas." and "Mäklin based his new species on a single specimen merely labeled North America." George Horn (1870) in his revision of the Tenebrionidae of America listed *S. crenatum* under "Unknown Species." Charles Leng (1920) listed the species from Florida and North America while Triplehorn and Spilman (1973) had only 36 specimens at hand for their study. Triplehorn (pers. comm.) considered this species quite rare and indicated the Iowa specimen was a big surprise. Thomas and Okins (2011) presented a key to the seven species of *Strongylium* occurring in Florida. Generally what Triplehorn and Spilman (1973) wrote still holds true: "We know very little about this species."

This beetle species was described by Fredrik Wilhelm Mäklin who lived in Finland from 1821-1883 (Anonymous 1883). The generic name *Strongylium*, which in Greek means "round", was proposed by Englishman William Kirby in 1818 (Triplehorn and Spilman 1973). The specific epithet *crenatum* probably refers to the small rounded knobs or teeth on each side of the pronotum but may also refer to the sub-crenate punctate-striate elytra (Mäklin 1864). Triplehorn and Spilman (1973) indicated specimens have "brownish elytra which have greenish reflections"; Thomas and Okins (2011) indicated "elytra brown with iridescent green sheen" in their key; Mäklin (1864) indicated his one specimen was "greenish-brassy, color transparent reddish-brown". Specimens examined often vary from shiny reddish-brown to dark brown in color with greenish metallic color present to almost absent. "The length is 7.4 to 10.8 mm and the width is 2.2 to 3.4 mm" (Triplehorn and Spilman 1973).

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Steiner, Jr. (2008) wrote "In Maryland, adults occur from late May to early September and do not overwinter," while Triplehorn and Spilman (1973) indicated "Adults were collected May 6th to July 22nd." According to Steiner, Jr. (1995) "Strongyliines tend to live in relatively hard wood..." and (Steiner, Jr. 2008) "Larvae tunnel in dead standing wood and probably in rotten wood in live trees." Triplehorn and Spilman (1973) provided the following information on larvae: "reared from decayed ash log; in moist decayed persimmon log." Baker (1972) and Drooz (1985) covered the entire family of Tenebrionidae in one paragraph mentioning that "A few species in the genus *Strongylium* bore into the wood of living trees at stubs or wounds."

Methods

Searches were made for information and specimens on the internet, in the literature, and by contacting collection managers and curators. Field searches were made in southern Iowa during the 2003 to 2011 field seasons at night with different combinations of lights and searching logs and tree trunks with flashlight; day collecting consisted of searching logs and under bark for specimens.

The following individuals listed in alphabetical order were queried for label data for this paper from their institutions, museums, or collections (abbreviations are those used in the text below): James Boone, Field Museum of Natural History, Chicago (FMNH); Ralph Holzenthal, University of Minnesota, St. Paul (UMSP); Paul Lago, personal collection, University of Mississippi, University (PKLC); Steve Krauth, Wisconsin Insect Research Collection, University of Wisconsin, Madison (WIRC); Serge Laplante, Canadian National Collection of Insects, Ottawa (CNCI), Serge Laplante, personal collection (SLC); Mark O'Brien, University of Michigan Museum of Zoology, Ann Arbor (UMMZ) Edward Riley, Texas A & M University, College Station (TAMU); Edward Riley, personal collection (EGRC); Kristin Simpson, Enns Entomological Museum, University of Missouri, Columbia (EEMC); Paul Skelley, Florida State Collection of Arthropods, Gainesville (FSCA); Michael Thomas, Florida State Collection of Arthropods, Gainesville (FSCA); Charles Triplehorn, Museum of Biological Diversity, Columbus, Ohio (CATIC); Doug Veal, personal collection, Marion, Iowa (DAVC); James Zahniser, University of Illinois at Urbana/Champaign, Illinois Natural History Survey Collection, Urbana (INHS).

Results

Strongylium crenatum specimen records include those obtained from collections, published sources, and the internet by state; data as given to me by collection managers and curators or as gleaned from the literature; number of specimens per date and location in brackets.

ALABAMA: Mobile, Alabama (Triplehorn and Spilman 1973); Dale Co. (CATIC); Jefferson Co., Birmingham, 17 June 1956 [1], leg. H. R. Steeves, Jr., at light; Walker Co., Jasper, 15 August 1980 [1], T. King, at light (FMNH); Alabama (Downie and Arnett 1996). **ARKANSAS:** New State Record. Garland and Polk Co., Little Rock [12] (CATIC). **FLORIDA:** Ocala National Forest, Alachua Co., Gainesville; Volusia Co., Enterprise; Highlands Co., Highlands Hammock, Sebring; Jackson Co., Marianna; Putnam Co., Crescent City (Triplehorn and Spilman 1973); Jackson Co., Enterprise, Sebring, Ocala; Alachua Co.; Dixie Co. [10] (CATIC); Leon Co., Tall Timbers Res. Sta., 20 m. N. Tallahassee, 9-15 July 1972 [1], R. L. Jacques, Jr. (FMNH); Alachua Co., Gainesville, 5 June 1989 [1], Robert Wharton (TAMU); Alachua Co., Gainesville, 29 May 1964 [1], 13 June 1964 [1], R. E. White; Hogtown Creek & I-75, 18 May 1988 [1], 6 June 1988 [1], 19 June 1988 [2], P. E. Skelley, blacklight trap; Doyle Conner Building, 21 May 1993 [1], P. Skelley, log

litter; 28 March 1971 [1], L. Buschman, rotting wood reared ex larva; Beville Heights, 3 July 1980 [1], L. A. Stange, blacklight trap; Co. Rd. 17B, 1 September 1983 [1], K. W. Vick, blacklight trap; Liberty Co., Torrey State Park, 17 July 1983 [1], P. M. Choate, Jr.; 28 June 1977 [1], 6 June 1982 [1], M. C. Thomas, blacklight trap; Polk Co., Lakeland, 20 May 1974 [1], M. C. Thomas and R. Raymond, beating dead branches; Lake Co., Mascotte, 12 June 1984 [1], W. W. Smith, hickory; Putnam Co., Little Orange Lake, 6 July 1984 [1], K. W. Vick, blacklight trap (FSCA); Florida (Downie and Arnett 1996). **GEORGIA:** Effingham Co., Clio (Triplehorn and Spilman 1973); Clarke Co. (CATIC); De Kalb Co., 22 June 1969 [1]; Clarke Co., 2 mi. N. Athens, 24 June 1976 [1], R. Turnbow; Clarke Co., Whitehall Forest, emerged 4-9 May 1975 [1], R. Turnbow (FMNH). **IOWA:** New State Record. Appanoose Co., Sharon Bluffs State Park, 21 July 2007 [1], D. A. Veal, combination UV-florescent light (DAVC); Fremont Co., Waubonsie State Park, 3 July 2011 [1], D. A. Veal, combination UV-florescent light (DAVC). **KANSAS:** New State Record. Crawford Co., 3 miles NE Pittsburg, 13 June 2005 to 27 June 2005 [1], Glenn A. Salsbury, canopy trap (specimen # 757167) (UKNHMD 2008); Douglas Co., K. U. Nat. Hist. Res., 5 mi. NE Lawrence, 1 July 1982 [1], 9 July 1982 [1], D. B. Wahl (CNCD). **LOUISIANA:** New State Record. E. Baton Rouge, Par. Baton Rouge, 3 June 1982 [1], 10 June 1982 [1], 18 June 1982 [1], 23 June 1982 [2], E. G. Riley; (TAMU; EGRC). **MARYLAND:** Montgomery Co., Plummers Island, 13 July 2002 (Steiner, Jr. 2008). **MISSISSIPPI:** George Co., Lucedale (Triplehorn and Spilman 1973); Issaquena Co., 2 mi. SW Shipland, 20 June 1992 [2], Paul K. Lago; Hancock Co., Stennis Space Center, 2 June 1994 [1], Paul K. Lago (PKLC). **MISSOURI:** New State Record. Boone Co., 1.1 mi. W. Jct. US 63 & 163 S of Columbia, 25 June 1975 [2], S. E. Thewke, identified C. A. Triplehorn; Boone Co., 92 deg. 16' 30"W, 38 deg. 54' 06"N, 20 June 1975 [4], J. W. Smith and S. E. Thewke (EEMC); Randolph Co., 1 mi. E. Moberly, 19 July 1972 [1], 20 July 1972 [1], 30 June 1973 [2], 1 July 1973 [2], 7 July 1973 [1], 8 July 1973 [1], 29 June 1974 [2], 19 July 1976 [1], 3-4 July 1992 [3], E. G. Riley (TAMU; EGRC); Barry Co., Roaring River State Park, 19 June 1978 [1], G. H. Nelson; Henry Co., 14 mi. SE. Clinton, 26 June 1974 [1], G. H. Nelson, on *Prunus americana*; Jackson Co., Bur Oak Woods Natural Area, 20 June 1998 [1], 21 June 1998 [1], G. H. Nelson, on *Quercus macrocarpa*; Raytown, 24 June 1975 [2], G. H. Nelson, UV light; 10 June 1974 [1], G. H. Nelson, dead limb *Maclura pomifera* (FSCA); Jackson Co., Greenwood, 30 June 2010 [1], porch light, mature forest area with oaks, hickories, and walnut by a lake, Betsy Betros, <http://bugguide.net/node/view/494974> (Betsy Betros, pers. comm.). **NORTH CAROLINA:** Haywood Co., Retreat (Triplehorn and Spilman 1973); Haywood Co., Retreat, June (Brimley 1938); Darden, 12 June 1957 [1], William F. Chamberlain (TAMU); Durham Co., Parkwood, 23 June 2010 [1], house light, no specimen kept, Patrick Coin, <http://bugguide.net/node/view/485251>; North Carolina (Downie and Arnett 1996). **OHIO:** Hamilton Co., Cincinnati (Triplehorn and Spilman 1973); near Cincinnati, "*Crenatum* is a rare and beautiful species. I have beaten specimens from the dead branches of Haw tree, June 22, 1900 and June 26, 1901." (Dury 1902); Ohio (Downie and Arnett 1996). **OKLAHOMA:** New State Record. Latimer Co., June 1983 [1], June 1991 [1], June 1993 [1], Karl Stephan (TAMU). **SOUTH CAROLINA:** Savannah River Project; Florence Co., Florence (Triplehorn and Spilman 1973); one pinned specimen (CUAMD 2007); Florence Co., May-July, at lights, blacklight trap, tanglefoot screen (Kirk 1969). **TENNESSEE:** Morgan Co., Burrville (Triplehorn and Spilman 1973); Tennessee (Downie and Arnett 1996). **TEXAS:** Colorado Co., Columbus; Dallas Co., Dallas (Triplehorn and Spilman 1973); Bowie Co., Red River at Highway 8, 30 May 1998 [4], E. G. Riley, UV light, sample 671; Sabine Co., 9 mi. E. Hemphill, "Beech Bottom", 22 May to 14 July 1989 [1], R. Anderson and E. Morris, Malaise trap beech-magnolia forest; Angelina Co., Angelina National Forest, 2.5 mi. N. Rockland, V-31-VI-1996

[1], Clarke, Menard, and Riley, funnel trap hardwood bottomland, sample 186; Brazos Co., Koppe's Bridge 5 mi. SW College Station, 3 June 1995 [1], E. G. Riley, sample 127; Brazos Co., College Station, Lick Creek Park, 14 May 1997 [2], E. G. Riley, uv light bottomland forest; Sabine Co., Mill Creek Cove, Beech Bottom, 8.8 mi. NE Hemphill, IV-28-V-10-2008 [1], E. G. Riley (TAMU; EGRC); Texas (Downie and Arnett 1996). **VIRGINIA:** Chesterfield, Pocahontas St. Pk., 27 June 1992 [1], 28 June 1992 [1], uv light, S. Laplante (CNCD); Pocahontas St. Pk., 1998, S. Laplante (SLC). Turkey Run and Great Falls Parks, 23-25 June 2006, Potomac Gorge BioBlitz (Evans 2008; TNC 2006).

One specimen was reported collected in Great Smoky Mountains National Park but I was unable to obtain further information: #2442 *Strongylium crenatum*, Ciegler and Merritt 2000, ID = Adriean J. Meyer (GSMNP 2010).

Three good photos of *Strongylium crenatum* were found in the literature (Steiner, Jr. 2008; Triplehorn and Spilman 1973; Thomas and Okins 2011).

Discussion

Strongylium crenatum specimen records are reported from 17 states. The western edge of the distributional range is now marked by western Iowa, eastern Kansas, eastern Oklahoma, and eastern Texas; the northern edge is now marked by southern Iowa, southern Ohio, and Maryland. No label data were obtained from the following states that occur within the presumed range: Delaware, Illinois, Indiana, Kentucky, Nebraska, New Jersey, and West Virginia. No specimens were located in collections contacted in Wisconsin, Minnesota, and Michigan (Steve Krauth, Ralph Holzenthal, and Mark O'Brien, pers. comm.). Records from Arkansas, Iowa, Kansas, Louisiana, Missouri, and Oklahoma represent new state records (see map, Fig. 1).

The earliest collected specimen was 14 May in Brazos County, Texas; the latest collection was 1 September in Alachua County, Florida. Most specimens were collected in June (51) followed by July (19), May (7), August (1), and September (1). When mode of collection was provided the majority of specimens were collected using lights. Other methods of collection included malaise trap, funnel trap, canopy trap, sugar baits, beating dead branches, and reared from log litter; many labels indicated collection in wooded areas or forests or from bur oak, wild plum, hickory, ash, persimmon, haw, or Osage orange. These data indicate this species is a generalist preferring wooded areas and may be collected using a variety of methods.

The Sharon Bluffs State Park collection site is located in south central Iowa along the Chariton River in Appanoose County about nine miles from the Iowa-Missouri border. The first 25 acres for this 144 acre park was purchased in 1929 (Wolf 1991). Prior to Euro-American settlement the vegetation of this area was probably mostly prairie and savanna on the uplands with forest habitat along river corridors (Mutel 2008). Today the entire park is forest, except for the campground and picnic area, and dominated by white and pin oak and shagbark and kingnut hickory (Mark Leoschke, pers. comm.), with buckeye, basswood, and sugar and silver maple also present.

The Waubonsie State Park collection site is an upland area located in southwestern Iowa about five miles from the Missouri River and about five miles from the Missouri-Iowa border. This site is dominated by chinquapin oak (John Pearson, pers. comm.) with bur and white oak, basswood, and paw paw also present. Pre-settlement vegetation of these loess hills was probably grassland and savanna (John Pearson, pers. comm.; Mutel 1989). The state of Iowa purchased lands and founded a park during 1926 (Wolf 1991).

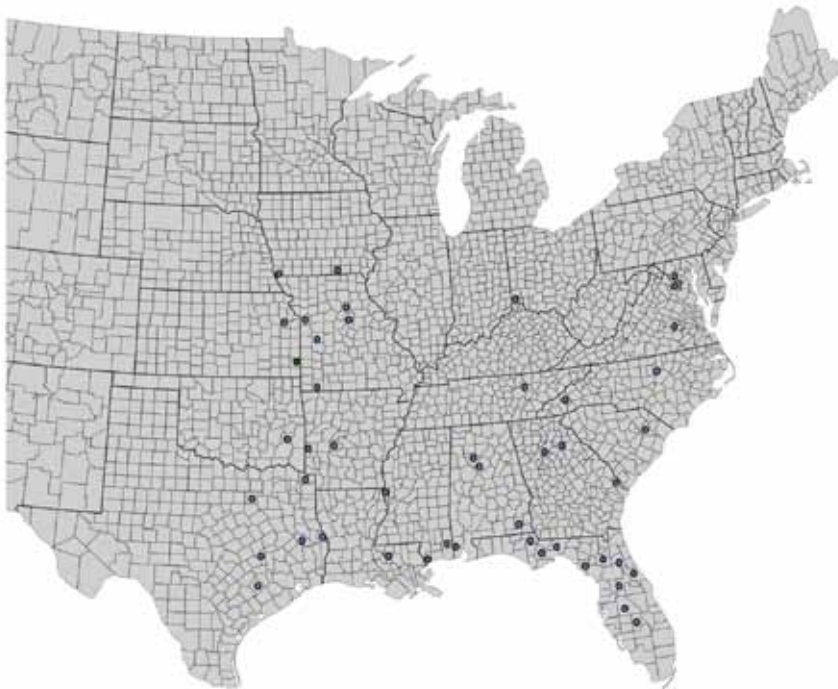


Figure 1. Range map of *Strongylium crenatum*.

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