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Additions to the Known U.S. Distribution of *Latrodectus geometricus* (Araneae: Theridiidae)

K. S. BROWN,¹ J. S. NECAISE,² AND J. GODDARD³

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ABSTRACT The range of the brown widow spider *Latrodectus geometricus* C. L. Koch includes much of Africa and South and Central America. This medically important spider has been recently introduced to Japan, Indonesia, Papua New Guinea, Australia, Hawaii, and California. After the identification of the brown widow spider in New Orleans, LA, and southern Mississippi, surveys in the southeastern United States were conducted from the fall of 2006 through February 2008. We found populations of brown widow spiders in Georgia, Texas, and multiple localities in southeastern Louisiana and Mississippi. In Mississippi, specimens were collected as far north as a county bordering Tennessee. In New Orleans, the brown widow spider has been commonly collected from various locations where human contact is likely.

KEY WORDS *Latrodectus geometricus*, Theridiidae, venom, distribution

There are five recognized species of *Latrodectus* (Araneae: Theridiidae) in the United States: the southern black widow spider *L. mactans* (Fabricius), the western black widow spider *L. hesperus* Chamberlin and Ivie, the northern black widow spider *L. variolus* Walckenaer, the red widow spider *L. bishopi* Kaston, and the brown widow spider *L. geometricus* C. L. Koch (Platnick 2007). Of these, the brown widow spider is considered one of the least dangerous to humans. When disturbed, the adult female brown widow spider will commonly withdraw into her silken retreat. On further disturbance, females will often retract their legs and drop from their webs exhibiting prolonged thanatosis. This typical behavior, marked by a lack of aggression, is one factor that contributes to *L. geometricus*' docile reputation.

McCrone (1964) indicated that, although *L. geometricus* had one of the most lethal venoms of the five *Latrodectus* species studied [*L. tredecimguttatus* (Rossi), *L. geometricus*, *L. variolus*, *L. mactans*, and *L. bishopi*] based on LD₅₀'s in mice, the average amount of venom obtained per spider was the lowest. In humans, reactions to *L. geometricus* bites historically tend to be localized to the bite site, with systemic reactions usually being restricted to the young (Müller 1993). Of three medically documented cases of brown widow spider bites in South Florida, one reaction was rated severe. Interestingly, this case involved an otherwise healthy adult male (G. B. Edwards, personal commu-

nication). In all cases, bites occurred after the accidental trapping of a spider against bare skin.

At the time of its description in 1841, *L. geometricus* was identified in both South America and southern Africa. It is a common spider in Brazil, along the eastern coast of South America, and in South Africa (Anderson 1972, Müller 1993, Mullen 2002). Since the time of its description, the known range of *L. geometricus* has greatly expanded, so much so that it is now recognized as a cosmopolitan species. Global commerce has often been implicated as a means of *L. geometricus* introductions to new localities. Sites of recent human introductions include Australia, Papua New Guinea, Indonesia, and Japan (Raven and Gallon 1987, Ono 1995, Forster and Forster 1999, Garb et al. 2004). Because of its abundance and affinity for structures, it is regularly seen in residential buildings in some areas where it has been introduced (Jimenez 1998).

The distribution of *L. geometricus* within the United States has historically been limited to peninsular Florida, where it was first introduced into southern counties in the first half of the 20th century. McCrone and Stone (1965) stated that it was found as far north as Daytona Beach. However, by the mid-1980s, this spider had migrated or was transported northward and became established in Jacksonville, FL. It can now most likely be found in every county in Florida and was collected as far north as Beaufort, SC, in 2001 (G. B. Edwards, personal communication). The brown widow spider has recently been introduced into Hawaii (Pinter 1980) and southern California (Garb et al. 2004). Herein, we report the first records of *L. geometricus* from the United States Gulf Coast and discuss its current abundance in Louisiana and Mississippi.

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Table 1. Location and date of collection of specimens of brown widow spiders in four surveyed states

State	Parish/county (no. collected)	City	Collection date	Geographic coordinate			
Georgia	Clarke	Athens	11 Jan. 2008 (1)	33.93311° N, 83.31165° W			
Louisiana	Ascension	Gonzales	3 Nov. 2006 (6)	30.21652° N, 90.94906° W			
	Geismar		May 2007 (1)	30.24765° N, 90.99652° W			
	Assumption	Belle Rose	3 Nov. 2006 (4)	30.00941° N, 91.10693° W			
	Cameron	Johnson Bayou	1 Feb. 2008 (3)	29.76254° N, 93.65706° W			
	East Baton Rouge	Baton Rouge		5 Dec. 2006 (2)	30.35428° N, 91.06746° W		
				24 May 2007 (1)			
				13 July 2007 (2)			
				17 July 2007 (2)			
				16 July 2007 (1)			
				25 July 2007 (1)			
				2 Aug 2007 (1)			
				20 Oct. 2006 (3)	29.95314° N, 90.18461° W		
				Harahan	July 2002 (35)		
				Harvey	21 Nov. 2006 (2)	29.87879° N, 90.05093° W	
	Lafayette	Broussard	Metairie	18 Dec. 2006 (1)	30.01896° N, 90.14863° W		
				14 Aug. 2007 (1)	30.13855° N, 91.94801° W		
			Lafayette	27 Jan. 2007 (9)			
				5 Jan. 2008 (1)			
				Youngsville	15 Mar. 2007 (1)		
	Orleans	New Orleans		20 Oct. to 20 Sept. 2007 (83)	29.96256° N, 90.07161° W		
St. Landry			9 Mar. 2007 (1)				
Tangipahoa			25 Sept. 2007 (1)	30.51688° N, 90.24453° W			
West Baton Rouge			9 Aug. 2007 (1)				
Mississippi			Desoto	Southaven	16 Oct 2006 (2)		
				Harrison	Biloxi	Jan. 2005 (1)	
					Gulfport	22 Sep 2006 (1)	
					Saucier	15 Sep 2006 (1)	
					Jackson	30 Aug 2006 (1)	
Texas			Rankin	Pelahatchie	2 Jan 2007 (1)		
	Nueces	Corpus Christi		3-4 Oct. 2007 (18)	27.75332° N, 97.41684° W		

Materials and Methods

Surveys for *L. geometricus* were conducted in Louisiana and Mississippi from the fall of 2006 through February 2008 after the authors concurrently found the spider in both states. The authors elicited the assistance of local pest management professionals and state and local officials throughout Mississippi and Louisiana to report and collect spiders. Spiders were also collected on trips made to the surrounding states of Texas and Georgia. Collected specimens were preserved in ethanol (70%, 100%) and identified according to published keys (Levi 1959, Levi and Levi 1962). Voucher specimens have been placed in the Mississippi Entomological Museum and the City of New Orleans Mosquito and Termite Control Board Entomological Collection. When possible, collection site longitude and latitude coordinates were recorded using a Garmin GPSMAP 60 CSx (Garmin International, Olathe, KS) hand-held global positioning receiver. Collection site data were plotted using Arc-View GIS version 9.1 software (Environmental Systems Research Institute, Redlands, CA). Notes on specific habitats at the collection site were also recorded.

Results and Discussion

The established range of *L. geometricus* in the United States has greatly expanded since the last distribution was published in 2002. Results of our survey indicate established populations of *L. geometricus* in

Texas, Georgia, and multiple localities in Mississippi and Louisiana (Table 1, Fig. 1).

During this study, collections of *L. geometricus* were made on trips to both Texas and Georgia. Brown widow spiders are known to occur in Texas (TAMUDE 2007). However, collection and distribution information is lacking. The distribution map of Garb et al. (2004) indicates a collection site that seems to be located in Texas. However, no collection information was given in the text. In south coastal Georgia, *L. geometricus* was collected and photographed (Insect Images 2007) by Dr. Sturgis McKeever in the late 1990s. Since then, it has become relatively common in south Georgia and was recently (2007) collected from the more northern cities of Atlanta and Athens (N. C. Hinkle, personal communication).

In Mississippi, the first known collection of *L. geometricus* was made in January 2005 by a Mississippi Department of Agriculture inspector in Biloxi (Keesler Air Force Base). Subsequently, in 2006 and 2007, several established populations were identified, especially near the Mississippi Gulf Coast. However, specimens have been collected as far north as Desoto County, which borders the Tennessee state line (Table 1). Generally, when one specimen was collected in an area, numerous others could be found nearby. In some infestations along the Gulf Coast, literally hundreds of *L. geometricus* were identified around the outside of buildings, and to a lesser extent, inside.

In Louisiana, a majority of the collections were made within the greater New Orleans area. The City

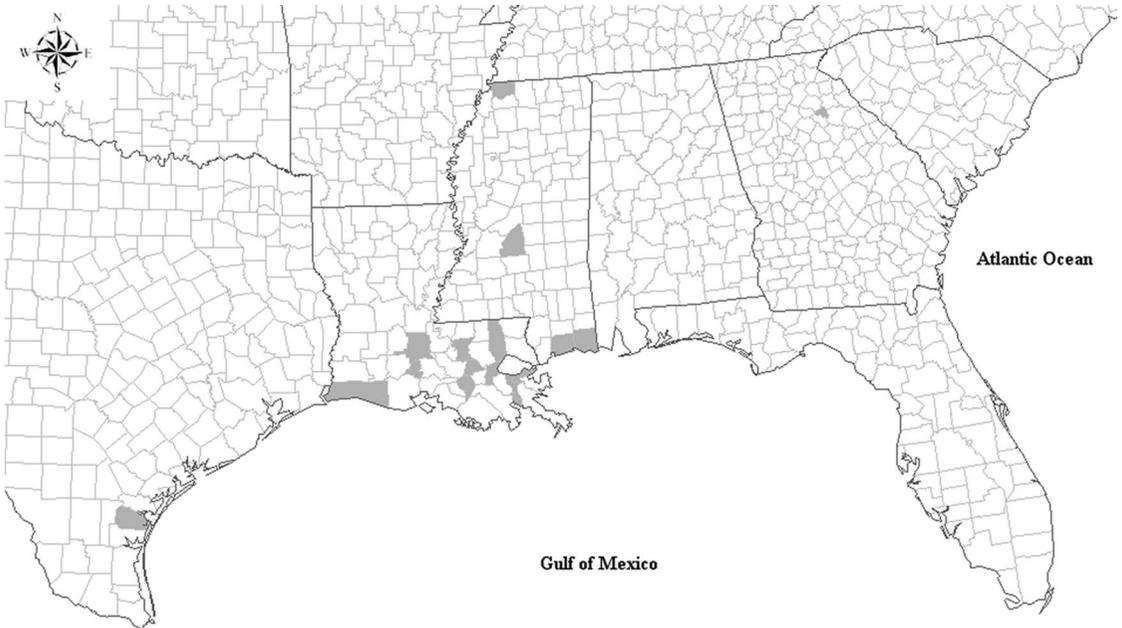


Fig. 1. Collection locations (shaded parishes/counties) of *L. geometricus* in the southeastern United States from this survey. *L. geometricus* has been collected in multiple additional locations in Georgia and South Carolina and is widespread in Florida (G. B. Edwards and N. C. Hinkle, personal communication).

of New Orleans Mosquito and Termite Control Board (NOMTCB) is currently working with state officials and pest management professionals to monitor the distribution of *L. geometricus* within the state. The earliest record of *L. geometricus* in Louisiana was an infestation at a car dealership in Harvey, LA, in July 2002. Specimens from that site were sent to Rick Vetter at the University of California–Riverside, who positively identified them as *L. geometricus* (R. Vetter, personal communication). Voucher specimens from that collection have been placed in the Mississippi Entomological Museum. Within the city of New Orleans, populations of *L. geometricus* have increased to the point that it is now common to find them throughout the city and its vicinity. From 20 October to 29 December 2006, 4 adult female *L. mactans* and 80 *L. geometricus* were collected within the city. Before these recent collections, few *L. mactans* were reported to or collected by NOMTCB or Audubon Nature Institute entomologists within the city limits of New Orleans. The brown widow spider may be exploiting an open niche, virtually unfilled by any theridiid spider of its size class.

In New Orleans, LA, Gonzales, LA, and Lafayette, LA, *L. geometricus* was collected from multiple locations where human contact is likely. Spiders were collected from a greenhouse, handles of trash cans, traffic cones, a bank handicap ramp handrail, window frames, car garages, a fast food restaurant drive-thru window, electrical boxes, electrical cord reels, stored office furniture, public storage facilities, self contained tree watering bags, and other areas where contact with people is likely.

In New Orleans, the occurrence of *L. geometricus* may have been aided by accidental transport and distribution of spiders during a recent influx of vehicles, ornamental plants, and building materials. As New Orleans rebuilds after Hurricane Katrina, home improvement centers, retail garden centers, car dealerships, and local independent plant nurseries may play some part in the rapid distribution of *L. geometricus*. One of the collections in southeast Louisiana was made from a shipping rack for compressed gas cylinders that had recently been transported to a local refinery from outside the state.

In Florida, egg sac parasitoids in the family Eurytomidae have also been noted (G. B. Edwards, personal communication). The Florida specimens were identified as *Eurytoma latroducti* by Michael Gates of the USDA–ARS Systematic Entomology Laboratory (SEL) in Beltsville, MD. The authors have also noted parasitism of wild-collected *L. geometricus* egg sacs by native wasps (Hymenoptera: Chalcidoidea). The Louisiana wasp specimens have been sent to SEL for species confirmation.

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