The medical importance of the brown recluse spider, *Loxosceles reclusa* Gertsch and Mulaik, is well known for causing necrotic skin lesions in humans. The potential severity of wounds has generated a reputation that makes it one of the few spiders well known to the medical community. Consequently, necrotic lesions thought to result from spider bites often are misattributed to the brown recluse, even in geographic areas where the spider is not known to occur (Swanson and Vetter 2005, Vetter 2008). Information about the distribution of the brown recluse is North America is essential for accurately diagnosing spider bites, yet knowledge about its distribution is sometimes fragmentary or incomplete. Although the spider is known to be virtually restricted to the South and central Midwest (Gertsch and Ennik 1983; Vetter 2005, 2008), the distribution information per state is extremely variable. For example, Nebraska's spider fauna is well-documented by county for many species (Rapp 1980) including the brown recluse, which is known only from the southeastern portion of the state and only within buildings. In contrast, there are no well-documented distribution maps in other states on the margin of the brown recluse's indigenous range such as Kentucky and Tennessee (recluses are common in the west, absent in the east) and Oklahoma and Kansas (recluses are common in the east with no data for the west, but states to the west lack brown recluse populations).

The distribution of the brown recluse spider in Illinois and Iowa is not well documented. The data for Iowa are sparse, probably because the state is one that encompasses the northern limits of the spider's range where it may be reaching the edge of its supportive habitat. Iowa also suffers from a historical paucity of arachnological attention. The data for Illinois are more extensive, as this state extends farther south into the range of the brown recluse, and there has been a relatively active arachnological community in the state. Yet, there is no definitive publication specifically addressing Illinois' recluse spider distribution. The general anecdotal consensus from Illinois officials is that the brown recluse is found indoors and outdoors in the southern third of the state, indoors only in the middle third, and is rare to nonexistent in the northern third. Cramer and Maywright (2008) determined a limiting temperature of \(-5^\circ C\) for brown recluse over-winter survival and suggested that temperature might limit the species' northern distribution.

To better understand where this spider occurs, we initiated the Illinois–Iowa Brown Recluse Spider Project (IIBRSP) in 2002, offering to identify any spider in these two states that was suspected to be a brown recluse. We also requested *Loxosceles* databases from agencies that collect and identify arthropods in Illinois and Iowa. In addition to providing basic biological information on this infamous spider, knowing where the brown recluse does and doesn't exist in states that are on the margin of the native distribution might also...
prevent physicians from inappropriately diagnosing *Loxosceles* bites in portions of the state where the spiders are absent.

**Materials and Methods**

We erected the IIBRSP on the Monmouth College server (http://department.monm.edu/biology/recluse-project/index.htm) and therein offered to identify any spider that anyone from Illinois or Iowa thought might be a brown recluse. The Web site was initiated in 2002 and continues to be active. The Web site encouraged submissions from northern Illinois counties (north of Interstate 70) because evidence for brown recluse populations is already well established for southern Illinois. All arthropods submitted from 2002 to 2009 were recorded; after this date, only recluses were tallied. Most nonrecluse spiders were identified to family, although a few were identified to genus or species.

We also incorporated information from arthropod databases. We received *Loxosceles* records from the Illinois Natural History Survey (*N* = 194), the Illinois Department of Public Health (*N* = 25), the Iowa State University Department of Entomology (*N* = 26), and the study by Vetter (2005) (*N* = 17), the last of which reported the results of a recluse identification project similar to the IIBRSP except that it was nationwide in scope. We mapped the data as populations, defining a population as one or more specimens collected from one location within 1–2 mo. Hence, we attempt to represent individual populations rather than individual specimens of recluses on our map.

**Results**

Over the 11 yr of the ongoing IIBRSP, 403 arthropods were submitted from Illinois and Iowa. Of these, 66 were recluses, 55 from Illinois and 11 from Iowa. Since 2009, an additional 22 recluses were recorded, 20 from Illinois and 2 from Iowa for a total of 88 new records from the IIBRSP. Combining data from the IIBRSP and other arthropod databases, brown recluse spiders were documented from 68 of Illinois’ 102 counties and 30 of Iowa’s 99 counties (Fig. 1).

Of the non-*Loxosceles* specimens submitted to the IIBRSP (and from Vetter 2005), 18 families of spiders were represented (Table 1). The most common spider families included the Miturgidae (yellow sac spiders, *Cheiracanthium*), Lycosidae (wolf spiders), Dysderidae (*Dysdera crocata* C. L. Koch), Agelenidae (funnel weavers), Araneidae (orb weavers, including species with spines on the abdomen, e.g., *Micrathena*), Pholcidae (the long-bodied cellar spider *Pholcus phalangioides* [Fuesslin]), and Theridiidae (comb-footed spiders, mostly *Parasteatoda tepidariorum* [C. L. Koch] and *Steatoda triangulosa* [Walckenaer]). Three nonspider arthropods also were submitted as putative brown recluse spiders: a beetle (Coleoptera: Scarabaeidae, *Phyllophaga* sp.), an assassin bug (Hemiptera: Reduviidae), and a pseudoscorpion (Arachnida: Pseudoscorpionida).

![Fig. 1. A map of the distribution of the brown recluse spider in Illinois and Iowa. The size of the dot corresponds to the number of distinct populations (range, 1–15) of brown recluse spiders per town or city, with a 4-pixel increase in dot size for each population >1 (i.e., 1 population = 24 pixels, 2 populations = 28 pixels, etc.). For Illinois, the dot corresponds to the actual location. For Iowa, most of the data were recorded by county only, not city or town; therefore, the dot was placed in the center of the county unless actual locality data were available. Monmouth (northwest quadrant of Illinois) is represented with an asterisk because it is referenced in the discussion.](https://academic.oup.com/jme/article-abstract/51/1/46/862751/fig1)

**Table 1. A list of the non-Loxosceles arthropods submitted to the authors as potential brown recluse spiders**

| Spiders                  |   |
|--------------------------|---|
| Miturgidae               | 59 |
| Lycosidae                | 53 |
| Dysderidae               | 42 |
| Agelenidae               | 30 |
| Araneidae                | 35 |
| Pholcidae                | 30 |
| Theridiidae              | 26 |
| Gnaphosidae              | 16 |
| Philodromidae            | 11 |
| Linyphiidae              | 9  |
| Salticidae               | 7  |
| Pisauridae               | 5  |
| Anypharidae              | 2  |
| Corinnidae               | 2  |
| Amaurobiidae             | 1  |
| Cybaeidae                | 1  |
| Tetragonathidae          | 1  |
| Thomisidae               | 1  |
| Nonspider arachnid       |    |
| Pseudoscorpion           | 1  |
| Insects                  |    |
| Reduviidae (Hemiptera)   | 1  |
| Scarabaeidae (Coleoptera)| 1  |
Illinois and Iowa medical personnel should benefit from the information presented here by encouraging them to more carefully evaluate necrotic skin lesions in the northern counties of each state without assuming that they are caused by the brown recluse. At the least, for patients exhibiting necrotic skin lesions, it would be critical to determine where the patient lived and worked. For example, Chicago-affiliated authors (Erickson et al. 1990, Bryant and Pittman 2003) published four cases of alleged loxoscelism but neglected to include information on the patients’ city of residence and work, making it difficult to determine whether loxoscelism was likely or not. The lack of patient location in published reports was a concern voiced by Vetter and Bush (2004). Considering the large human population and scant brown recluse population in the Chicago metropolitan area, it would be prudent to consider diagnoses other than loxoscelism for Chicago patients unless the patient is accompanied by a recluse spider caught at the site of the alleged envenomation. Necrotic skin lesions mistaken for loxoscelism (Swanson and Vetter 2005) have more probable etiologies than a brown recluse bite in areas of North America where the spider is rare or undocumented.

One area of future research would be to determine the frequency of the brown recluse spider in northern Missouri. Considering that few brown recluses have been found in southern Iowa, and that central Missouri is home to abundant recluse spiders, the state may contain another transition zone from heavy to sparse populations.

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