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DOMICILIARY SPIDERS OF COLES COUNTY

(TITLE)

BY

JAMES D. GIRE

PLAN B PAPER

SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR
THE DEGREE MASTER OF SCIENCE IN EDUCATION
AND PREPARED IN COURSE

ZOOLOGY 546

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CHARLESTON, ILLINOIS

1967

YEAR

I HEREBY RECOMMEND THIS PLAN B PAPER BE ACCEPTED AS
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DEPARTMENT HEAD

DOMICILIARY SPIDERS OF COLES COUNTY

"Telltale violin marks a new-found killer" was the caption that appeared under the full-page picture of a spider. The picture was printed in Life magazine in its October 4, 1963, issue (9). The spider is commonly known as the brown recluse spider.

Although the range of this spider was given as the south and southwest, the article was intriguing and I removed it from the magazine and placed it in my files.

In the summer of 1965, in a conversation with Dr. Garland Riegel, head of the Zoology Department of Eastern Illinois University, the brown recluse was mentioned. Dr. Riegel had heard of the spider and had received some specimens from Missouri. The actual preserved specimens gave me a much better perspective of the spider than the picture and it was barely two weeks later that I noticed a spider resembling the brown recluse under a porch in Charleston, Illinois. The spider was collected and given to Dr. Riegel for confirmation, and it was positively established to be a brown recluse spider--the first to be identified in Coles County.

In 1966, as part of the graduate requirements for a Master's degree, I was given the research assignment of determining the kinds of spiders inhabiting the heated buildings of this area, and of determining the abundance and distribution of the brown recluse spider.

METHODS OF COLLECTING SPIDERS

The collection of spiders was begun on November 20, 1966 and completed on March 20, 1967, or between the first and last hard freeze of

the winter season. This was necessary in order to insure that the spiders collected were actually inhabiting the buildings and not simply trespassing. Care was taken so that every conceivable hiding place would be examined--in closets, under dressers and beds, and in boxes. Crawl spaces were examined even to the point of digging into the earth in suspected areas. Some buildings required as long as three hours to examine completely.

The equipment consisted of a good flashlight, forceps, several vials of alcohol, an empty vial, and a bottle of ethyl chloride. Most of the spiders that were located were sprayed with the ethyl chloride, which immobilized them, and then picked up with the forceps and deposited in a vial of alcohol. Some of the Theridiidae were captured by merely placing a vial immediately below the spider and with the slightest disturbance, it would drop itself into the open vial. Agelenidae and Loxosceles spiders were the most difficult to capture because with only a slight disturbance they would disappear behind or under any available cover.

The first attempt at collecting spiders met with failure because of the location of the spiders in corners or near cracks in the building. A bottle, or a net, could not be placed over them before they could disappear from sight. Aerosol insecticides were tried but proved too slow in acting and also presented a health hazard in close areas. It seemed reasonable that if a substance could be found that would reduce the temperature of the spider, it would be far easier to capture. For this reason, ethyl chloride was tried because of its use in

freezing tissue for minor operations. It proved to be very successful. The liquid comes in a pressurized bottle with a nozzle that emits a pinpoint stream of fluid. It has no odor, and once stopped, the spider can be safely handled and placed into an empty bottle or vial of alcohol. Experiments with the brown recluse spider established that the spider will recover from several such freezings. There is no reason to believe that liquid freon or some other refrigerant might not work equally as well.

Inspections were made of seventy-four homes and buildings in and around Charleston, Illinois. Thirty-one had basements, twenty-four had crawl spaces, and nineteen had a concrete slab construction. Spiders were collected from fifty-one of these buildings, with twenty-three seemingly devoid of the creatures. It is interesting to note that these twenty-three spider-free buildings have had a general exterminating service performed within the past year. Apparently, either a chemical treatment is effective, or the lack of insect food, prevented the establishment of the spiders in these buildings.

RESULTS AND CONCLUSIONS

A total of 230 spiders were collected from fifty-one buildings. Identification was made using Kaston's "How to Know the Spiders" (8) and Bristowe's "The World of Spiders" (2). Confirmations were made by Mr. Richard Funk, of the Zoology Department, Eastern Illinois University, and Mr. John Unzicker, of the Illinois Natural History Survey at the University of Illinois.

Representatives of the families Theridiidae (Fig. 1) and Agelenidae

(Fig. 2) proved to be the most common spiders to be found in buildings (Chart 1). In overall distributions, the Theridiidae were not limited to any particular area of the buildings; whereas, the Agelenidae were found mainly in basements and crawl spaces. Many of the Theridiidae were not identified as to species because they were immatures and adequate keys were not available for this purpose. The remains of many "harvestmen" or "daddy long-legs" were found in homes, but these are not spiders. An interesting article on them appears in the April 1962 issue of Scientific American by T. H. Savory (11).

Perhaps the most interesting of the various spiders discovered in the homes was Loxosceles reclusa belonging to the family Loxocelidae (Fig. 3). As has been previously indicated, this particular spider has become nationally known as a poisonous or "killer" spider (9). The brown recluse, as it is commonly known, is of medium size, measuring $3/8$ inch long and about $3/16$ inch wide. The legs are long which gives it a much larger appearance. The body color varies from light fawn to dark brown. The most distinguishing mark is the dark fiddle-shaped pattern on the anterior portion of the carapace which narrows to a thin center line extending almost to the abdomen. Unlike most spiders, this species and its close relatives have six instead of eight eyes (7). Both sexes have this mark and, according to Wingo (12), both possess the potent poison. Gertsch (6) in 1958 gave an excellent description of the species and described the distribution as "Southeastern and Central United States" from Tennessee and Alabama westward to Kansas, Oklahoma, and Texas. Wingo (13) enlarged the area on his map to include

the southern half of Illinois. Recent unpublished reports from Mr. John Unzicker, of the Illinois Natural History Survey, indicate an even wider spread of the spider in Illinois (Fig. 4). It can be assumed that many communities not reporting the spider are nevertheless harboring it.

Pest control magazines over the past several years list many cases of brown recluse bites in homes. In one case, a brown recluse spider was taken from the body of a patient in a Tucson, Arizona, hospital after it bit him (10).

Of the seven brown recluse spiders that this author has collected in Coles County, three were found in basements, one in a heated workshop, one in a crawl space, one in a school corridor, and one under a porch. The locations of the infested buildings were rather widespread in the City of Charleston. An extensive search of other communities would undoubtedly uncover many more. Baerg (1) lists six poisonous spiders in the United States, but with the exception of the black widow, Latrodectus mactans, the brown recluse is the only one reported in the area of Coles County. Its habit of hiding in homes, behind and under furniture, and the fact that it can live for a long time without moisture makes it even a greater menace than the black widow.

Wingo's (12) description of reaction to a bite is quoted below:

"The typical reaction in man following bite by the brown recluse is necrosis (killed tissue) at the site of the bite. The victim may not be aware of being bitten for two or three hours, or a painful reaction may occur immediately. A stinging sensation is usually followed by intense pain. A small blister usually rises and a large area around the bite becomes congested and swollen. The patient may become restless,

CHART 1.--DOMICILIARY SPIDERS OF COLES COUNTY
Results of survey of spiders collected in and around heated buildings
during the winter months of 1966-67.

	Basements	Crawl Space	Living Area	Other ¹	Total
Agelenidae					
<u>Tegenaria domestica</u> (Clerck)	64	12	1	11	88
<u>Agelenopsis pennsylvanica</u> (Koch)					
Theridiidae					
<u>Steatoda triangulosa</u> (Walckenaer)	53	10	9	9	81
<u>Steatoda borealis</u> (Hentz)					
Immatures					
Pholcidae					
<u>Pholeus phalangioidea</u> (Fuesslin)	16	2			18
<u>Spermaphora meridionalis</u> (Taczanowski)					
Clubionidae					
<u>Clubiona obesa</u> (Hentz)	4		6		10
<u>Clubiona pallens</u> (Hentz)					
<u>Marcellina piscatoria</u> (Hentz)					
Loxoscelidae					
<u>Loxosceles reclusa</u> (Gertsch & Mutaik)	2	2	1	1	6
Salticidae					
<u>Phidippus audax</u> (Hentz)	3		1		4
Scytodidae					
<u>Scytodes thoracica</u> (Latreille)				4	4
Thomisidae					
<u>Ebo latithorax</u> (Keyserling)		6			6
<u>Tmarus angulatus</u> (Walckenaer)					
<u>Xysticus transversalus</u> (Walckenaer)					
Gnaphosidae					
<u>Herpyllus vasifer</u> (Walckenaer)		1	2		3
<u>Gnaphosa sericota</u> (Koch)					
Dysderidae					
<u>Dysdera crocata</u> (Koch)		2			2
Micryphantidae			2		2
Anyphaenidae					
<u>Aysha gracilis</u> (Hentz)				1	1
Linyphidae					
<u>Lepthyphantes zebra</u> (Emerton)	1				1
Araneidae					
<u>Araneus cornutus</u> (Clerck)	1				1
Lycosidae					
<u>Lycosa gulosa</u> (Walckenaer)				2	2

¹Heated buildings, tunnels, etc.

feverish and have difficulty in sleeping. The local pain is frequently quite intense and the area surrounding the bite remains congested and hard to the touch for some time. The tissue affected locally by the venom is killed and gradually sloughs away, exposing the underlying muscles. The edges of the wound thicken and are raised while the central area is filled by dense scar tissue. Healing takes place quite slowly and may take six to eight weeks. The end result is a sunken scar which has been described as resembling 'a hole punched or scooped from the body.' Scars ranging from the size of a penny to half-dollar have been reported.

"The necrotic condition described above is typical of all bites of the brown recluse. However, in some cases a general systemic reaction has also occurred. In one case, the patient broke out with a rash resembling that of scarlet fever. In another case the kidneys were apparently affected causing bloody urine to be passed. These systemic disturbances probably occur infrequently and are the result of a 'full' bite (i.e., the injection of a maximum amount of venom), or extreme sensitivity to the venom. This general reaction to the bite of the brown recluse is certainly a serious condition and hospitalization of the patient is usually required. Those in poor general physical condition, young children, and older people are more apt to be affected seriously by the bite of the brown recluse.

"Until recently treatment of the bite was not specific. Use of antiseptics at the bite site and of sulfa drugs and antihistaminic agents has been recommended by various authors. Dillaha et al. (3) advocated

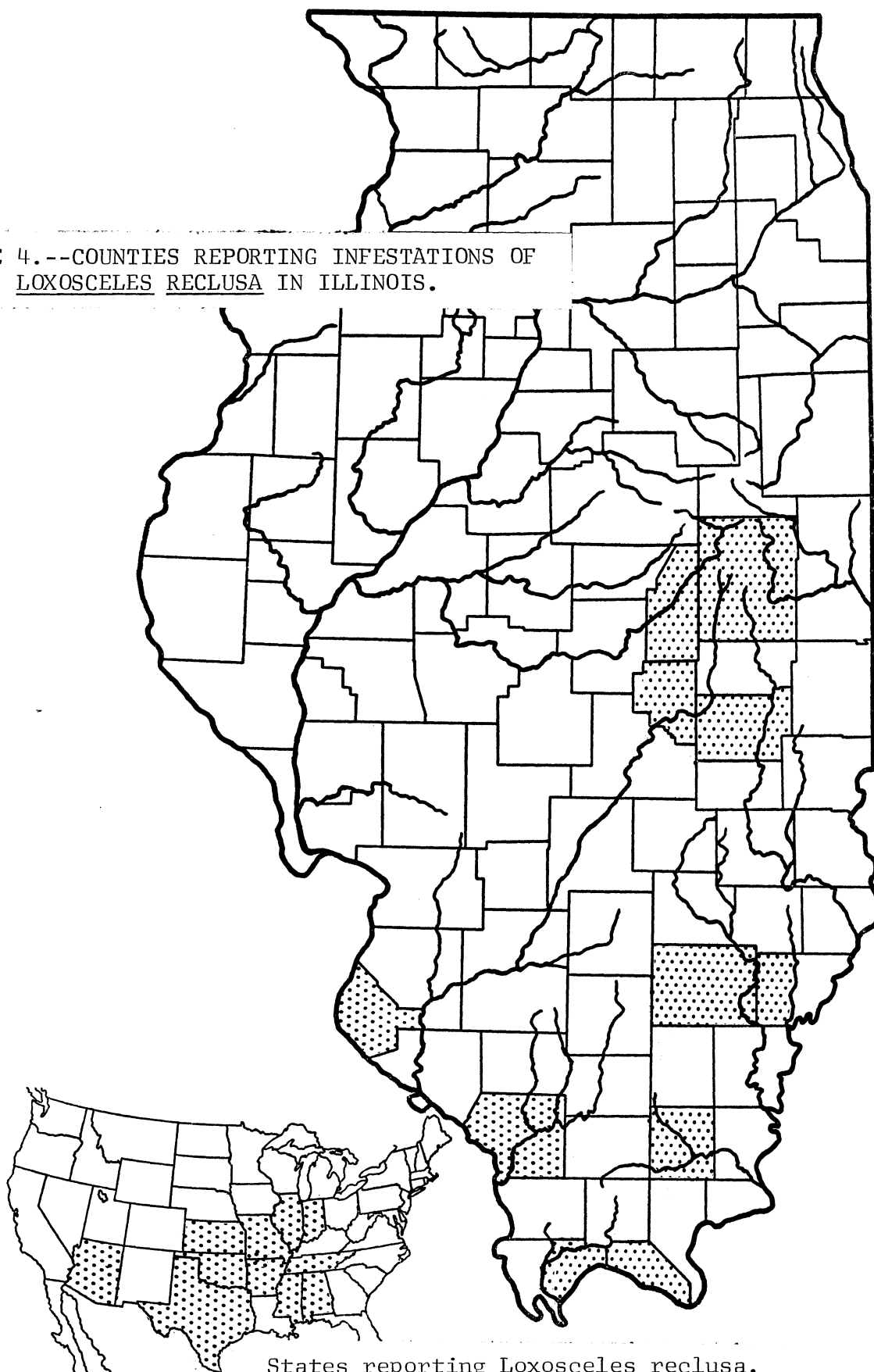
the prompt administration of corticosteroids. They stated '... larger doses given early may completely abort the gangrenous response as well as the systemic reaction. The dosage schedule which we have found most effective is: 80 mg. of methyl prednisolone (Depo Medral) intramuscularly, immediately; followed by one or two additional doses of the same amount at 24-48 hour intervals. Subsequently, step-wise decrease to 40, 20, 10 mg. every 24-48 hours, depending on the patient's response ...'

An interesting postscript to this paper is that, although the actual period of study was from the first to the last hard freeze of the winter, a recent discovery was made of a large infestation of Loxosceles reclusa in the basement and crawl spaces of the laboratory school at Eastern Illinois University. Over one hundred specimens of the deadly spider have been collected and the total number is estimated to be in the thousands.

SUMMARY

The most common spiders that inhabit the heated buildings of Coles County belong to the families Agelenidae and Theridiidae. The genus Loxosceles, however, appears as one of the five most common in total number collected and in overall distribution. The fact that these are poisonous spiders should lead to a more public recognition and avoidance of its danger. Chemical sprays, particularly Lindane, have been found to be effective in elimination of spiders from buildings. Antitoxins, such as cortisone, have been shown to be effective should a person be bitten by a brown recluse spider.

FIGURE 4.--COUNTIES REPORTING INFESTATIONS OF
LOXOSCELES RECLUSA IN ILLINOIS.



States reporting Loxosceles reclusa.