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SIGNIFICANCE OF SPIDERS (ARANEAE) AS PUBLIC HEALTH PESTS

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Abstract Spiders are an important part of ecosystems due to their feeding habits which involve predation, especially of insects. This group of arthropods currently includes over 40 thousand described species present on all continents except for Antarctica. They forage in diverse ecotopes and some are resistant to human-induced environmental changes, becoming part of the synanthropic fauna. Among these species, there are some that can cause arachnidism and therefore are of significance to public health. According to the World Health Organization, four genera of spiders contain species that can cause envenomation when they bite humans. Species from three of these four genera are present in Brazil: *Loxosceles*, *Latrodectus* and *Phoneutria.* Records show a high rate of envenomation from these spiders each year in Brazil which reinforces the importance of gathering knowledge not only on the mechanism of action of the venom from these spiders, which is already widely studied, but also calls for studies on ecology to serve as a basis for the management and prevention of such bites. In the present study, data on the distribution and presence of *Latrodectus geometricus* in municipalities of Piauí state*,* reveal the species' potential to colonize the urban environment, suggesting the need for educational actions aimed at prevention to keep them from becoming urban pests.
Key Words Araneism, Latrodectism, *Latrodectus geometricus,* Araneae, Theridiidae, Synanthropy

INTRODUCTION

Spiders are an important part of ecosystems due to their feeding habits which involve predation, especially of insects. This group of arthropods currently includes over 40 thousand described species present on all continents except Antarctica. They forage in diverse ecotopes and some are resistant to human-induced environmental changes, becoming part of the synanthropic fauna. Among these species, there are some that can cause arachnidism and therefore are of significance from the perspective of public health. According to the World Health Organization, 1981, four genera of spiders contain species that can cause envenomation when they bite humans: *Atrax* (Araneae, Mygalomorphae, Hexathelidae) endemic to Australia, *Loxosceles* with species endemic to America and Africa, *Latrodectus* present on all continents and islands (Garb et al, 2004) and *Phoneutria* endemic to Central and South America especially in areas with forests (Martins e Bertani, 2007). Species from the last three genera cited of the four indicated by the WHO, 1981 are present in Brazil.

Envenomation by the species *Loxosceles* (brown recluse spider), *Latrodectus* (widow spider) and *Phoneutria* (armed spider) occur in countries where they are endemic or where they were introduced, nevertheless there are no systematized records of this casuistic at the world level, and therefore there is no global panorama on arachnidism – symptoms caused by spider bites with the injection of venom. In Brazil these records are provided by the National Reporting System (Sistema Nacional de Notificação de Agravo) of the Ministry of Health 2002, and although notification is mandatory for accidents with pests, the data received is still incomplete. Although historically spiders are seen as a cause for panic and/or phobias (Granado et. al., 2005), science has revealed the positive aspects of these animals, whether as suppliers of promising molecules from their venom for pharmacological use, or for the biological control of insects pests, or as bioindicators of environments (Marc et al, 1999). Despite these divergent views, the increase in the number of reported spider accidents in Brazil can lead to the hypothesis that spiders are urban pests, even if they are in focal points of their geographical description. In the present study the potential for the *Latrodectus geometricus* to colonize the urban environment is analyzed based on preliminary data from a research project being carried out in the State of Piauí, Brazil, for which the results are currently being processed.

MATERIALS AND METHODS

Homes were investigated to determine if medically significant spiders were present in the neighborhoods of the municipalities referred to here as Municipalities 1 and 2 in the State of Piaui. Both are part of the Caatinga Biome. The inspections involved an active search inside and in the area immediately surrounding the homes, which included (on top of, under behind and inside) furniture, objects, piles of debris, rocks, wood and in cracks in the wall, beams and attics. The data analyzed here is for the spider *Latrodectus geometricus* (Araneae, Theridiidae).

RESULTS AND DISCUSSION

For evaluation purposes, the location inspected was considered positive for the presence of this spider when spider specimens were found either dead or alive, (male, female and spiderlings, exuviae, egg sac with eggs to hatch or with eggs already hatched. The names of the municipalities are to be kept confidential, as these results are part of the data for a Master's dissertation, which is still being processed and cannot yet be divulged. After proceeding with the inspection of sixteen homes, twelve in Municipality 1 and four in Municipality 2 the presence was detected of the brown widow, *Latrodectus geometricus*, in fifteen of them (93.75%). Table 1 shows a summary of the data collected. The presence of egg sac inside the home predominated in Municipality 2 (80%) and in the sum of the two (55.55%). The number of adult specimens was much lower when compared to the egg sacs. The most common place to find the brown widow was under furniture, regardless of the type of material it was made from, especially near corners.

Table 1. Presence of *Latrodectus geometricus* in the intradomicile and peridomicile of homes inspected in Piauí state, Brazil.

Taxon	Municipality	Nº of homes inspected		Evidence found (in numbers)			
		Positive	Negative	Intradomicile		Peridomicile	
				egg sac	spider	egg sac	spider
Latrodectus	1	11	1	73	3	85	2
geometricus	2	4	0	52	3	15	2

Based on these findings, although they are still preliminary, it is possible to defend the thesis that this synanthropic species of the *Latrodectus* genera, introduced through human action in Brazil and in countries on all continents (Garb et al., 2004), survives and reproduces in a modified environment. The fact that it is a species that feeds on a wide variety of prey (Forster, 1995; Hodar and Sanchez-Pinero, 2002) guarantees its survival outside the natural environment. The evaluation of its reproductive potential (data not shown) indicates that the production of oothecas with viable eggs is another important factor for the success of colonization in the anthropic environment. Such findings indicate the need for concern regarding their becoming urban pests, especially due to the fact that their venom is made up predominantly of neurotoxins, which are toxic to humans.

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