

A Preliminary Survey for Spiders on Grenada, West Indies

Jo-Anne Nina Sewlal

Dept. of Life Sciences, University of the West Indies,
St. Augustine, Trinidad and Tobago.
joannesewlal@gmail.com

ABSTRACT

During a two-week period in 2008, a wide variety of habitats on the island of Grenada, West Indies were surveyed for the presence of spiders. Contrary to the results of previous surveys in the Eastern Caribbean, Grenada exhibited a higher species richness in natural habitats. Members of the families Araneidae and Tetragnathidae comprised of almost half the species found. Some 12 localities were surveyed from 11 habitats, including six man-made habitats. Ten families representing 22 species were collected.

Key words: Spiders, Grenada, Araneidae, Barychelidae, Mimetidae, Oxyopidae, Pholcidae, Salticidae, Sparassidae, Tetragnathidae, Theridiidae, Thomisidae.

Spiders have a worldwide distribution, occupying all land environments except at the polar extremes. Currently there are 40,462 species of spiders that have been named so far (Platnick 2008), representing what is approximately one-fifth of the total. Thus it can be seen that the worldwide spider fauna is still far from being completely known. This situation is especially true of the spider fauna of the neotropics. Information on the diversity and distribution of arachnids is seriously lacking in the Caribbean as well as northern South America. Currently, the islands of Cuba (Alayón 1995), Barbados (G. Alayón and J. Horrocks, unpubl.), St. Vincent and the Grenadines (Simon 1894; de Silva *et al.* 2006), Anguilla (Sewlal and Starr, Inpress.), Antigua (Sewlal, unpubl.), Nevis (Sewlal and Starr 2007) and St. Kitts (Sewlal 2008) are the only islands in the Caribbean where the spider fauna has been documented at the species level, although this has been done at the family level for Trinidad (Cutler 2005; Sewlal and Cutler 2003; Sewlal and Alayón 2007; Sewlal, unpubl.). Additional information on the family Pholcidae of these islands, including Grenada, Anguilla and St. Kitts was documented by Sewlal and Starr (2008).

Surveys have tended to be in the favour of sampling vertebrates and plants, because they are very short and resource-limited, thus only the well-known and least diverse groups are adequately sampled (Scharff *et al.* 2003). As a consequence of this information on diverse groups are lacking (Longino 1994). Arthropods comprise the most diverse organisms in any terrestrial environment.

Arthropods are challenging to sample due to traits as small size, short generation time, diversity, limited distribution and strict environment requirements (microhabitats). These traits make it possible in theory to map environmental diversity and track environmental changes faster and more precisely than longer lived and flexible organisms like vertebrates and plants.

During 28 September to the 12 October, 2007, I spent

two weeks on the island of Grenada conducting a survey of the spider fauna of this island with the aim of collecting a substantial part of the spider fauna in a broad variety of habitats. Grenada is the most southerly isle of the Leeward Islands in the Eastern Caribbean (17°20'N 62°45'W). The island has an area of 168 km². It has a central point and the highest elevation on the island of approximately 1156 m. It has a range of habitats including: secondary forest, scrubland, montane forest, elfin woodland, dry forest, littoral woodland and riparian vegetation.

During this survey, 12 localities covering 11 habitats were sampled, including six that were man-made habitats or heavily influenced by human activities. Due to the fact that different taxa of spiders live in different microhabitats a variety of collecting methods were utilised. The main collecting methods employed were visual search, both at the ground level and above ground, including in shrubs and low trees and sweep-netting. In addition, many more cryptic microhabitats, especially under rocks, rotting logs and bark were also searched.

The sampling effort produced a total of 22 species representing 10 families (see Table 1). Littoral woodland, montane, dry forest as well as in and around houses had 9 species each while gardens yielded only one species (see Table 1). One expects the modifications found in altered habitats most likely to provide many and/or suitable points of attachment for families that construct webs to catch their prey. Some habitats also provide a natural path or gap in the vegetation where prey in particular flying insects can be blown into webs. Both of these requirements are usually met by roadside, garden habitats as well as the area in and around houses. The results of this survey did not strongly follow the trend found on islands previously sampled, as only one altered habitat exhibited such high species richness. Another feature of most altered habitats, in particular gardens and roadside, is the presence of artificial lighting which during the night attracts flying insects so that noc-

Table 1. Showing the species of both Araneomorphae and Mygalomorphae spiders for each habitat sampled in Grenada during 28th September to 12th October, 2007.

Family and Species	Habitat										
	Garden	Farm-land	Roadside	In and On Buildings	Abandoned Buildings	Secondary Forest	Montane Forest	Elfin Woodland	Dry Forest	Littoral Woodland	Riparian Vegetation
Araneidae											
<i>Argiope argentata</i>		✓	✓	✓	✓		✓		✓	✓	✓
<i>Eustala anastera</i>				✓						✓	
<i>Gasteracanta cancriformis</i>			✓						✓		
<i>Metepeira compsa</i>			✓							✓	
<i>Wagneriana</i> sp.								✓			
Barychelidae											
Sp. A				✓							
Mimetidae											
Sp. A				✓							
Oxyopidae											
<i>Oxyopes salticus</i>						✓				✓	
Sp. A									✓		
Pholcidae											
<i>Modisimus</i> sp.							✓				✓
<i>Physocyclus globosus</i>				✓							
Salticidae											
<i>Beata octopunctata</i>									✓		
<i>Hentzia vernalis</i>						✓	✓		✓	✓	
<i>Menemerus bivittatus</i>			✓	✓		✓	✓			✓	
Sparassidae											
<i>Olios</i> sp.		✓				✓	✓		✓		
Tetragnathidae											
<i>Leucauge argyra</i>			✓	✓	✓		✓				✓
<i>Leucauge regnyi</i>	✓	✓		✓	✓	✓	✓	✓	✓	✓	
<i>Tetragnatha</i> sp.								✓			
Theridiidae											
<i>Argyrodes elevatus</i>		✓	✓				✓			✓	
Sp. A									✓		
Sp. B				✓							
Thomisidae											
<i>Misumenops</i> sp.			✓				✓		✓	✓	
TOTAL	1	4	7	9	3	5	9	3	9	9	3

turnal species have a ready food supply.

However, high species richness was observed to occur predominantly in natural habitats. The vegetation structure is still recovering from the effects of successive hurricanes Ivan and Emily in 2005 and 2006 respectively. Many forests lost their closed canopy and the sparse understory was replaced by a thick carpet of razor grass (*Scleria secans*). One such habitat is montane forest as that sampled on Mount Qua Qua. This modification would make the habitat suitable for generalist species as well as others. Over time, when the habitat returns to its original state, those species suited to the original habitat will stay while others would be absent either through migration or local extinction. The dry forest did not experience major damage from the hurricanes so it is safe to assume that the species found there were present before the hurricanes hit the island.

Habitats at higher altitudes produced less species, which may be due to the decreasing number of habitats because of less available area.

Almost half of the species found belonged to the orb-weaving families Araneidae and Tetragnathidae. Therefore it came as no surprise that the most ecologically diverse species found also belong to these families. This included *Leucauge regnyi* and *Argiope argentata* which were recorded from 9 and 8 habitats respectively.

Specimens from the Mygalomorphae group or tarantulas were collected from homes however; they pose no danger to humans as the venom of this family is not known to be fatal.

Voucher specimens were deposited in the Land Arthropod Collection of the University of the West Indies, St. Augustine, Trinidad and Tobago.

ACKNOWLEDGEMENTS

Thanks to Dr. James De Vere Pitt and the National Science and Technology Council (NSTC) for hosting me. Thanks also go out to the Ministry of Forestry and Department of Agriculture for all of their assistance. The following persons and organisations assisted in facilitation, transport, and assistance in the field: the staff at NSTC for

the use of their office, Peter Thomas, Dwayne Mitchell, Rafael James, Anthony Jeremiah, the Courtenay and Pitt families. Thanks also to Dr. Bruce Cutler for helping with identification of the material collected. This project was partially funded by the National Science and Technology Council (Grenada).

REFERENCES

- Alayón, G.** 1995. Lista de las arañas (Arachnida: Araneae) de Cuba. *Cocuyo (Havana)*, (4): 16-26.
- Cutler, B.** 2005. Synotaxidae, another Trinidadian spider (Araneida) family. *Living World, Journal of The Trinidad and Tobago Field Naturalists' Club*, 2005: 49.
- de Silva, M., Alayón, G. and Horrocks, J. A.** 2006. The Spiders and their Relatives of St. Vincent and the Grenadines. Mayreau Environmental Development Organization, Mayreau Island, St. Vincent and the Grenadines. 129 p.
- Longino, J. T.** 1994. How to measure arthropod diversity in a tropical rainforest. *Biology International*, 28: 3-13.
- Scharff, N., Coddington, C. A., Griswold, C. E., Horminga, G. and Björn, P.** 2003. When to quit? Estimating spider species richness in a northern European deciduous forest. *Journal of Arachnology*, 31: 246-273.
- Sewlal, J. N. and Cutler, B.** 2003. Annotated list of spider families of Trinidad and Tobago (Araneida). *Living World, Journal of The Trinidad and Tobago Field Naturalists' Club*, 2003: 9-13.
- Sewlal, J. N. and Alayón, G.** 2007. Four more Trinidadian spider (Arachnida: Araneida) families. *Living World, Journal of The Trinidad and Tobago Field Naturalists' Club*, 2007: 85.
- Sewlal, J. N. and Starr, C. K.** 2007. Preliminary survey for spiders on Nevis, West Indies. *Living World, Journal of The Trinidad and Tobago Field Naturalists' Club*, 2007: 86-87.
- Sewlal, J. N.** 2008. Preliminary survey for spiders on St. Kitts, West Indies with comparative notes on Nevis. *Living World, Journal of The Trinidad and Tobago Field Naturalists' Club*, 2008: 66-69.
- Sewlal, J. N. and Starr, C. K.** 2008. New records of daddy-longlegs spiders (Pholcidae) from the Lesser Antilles, West Indies. *Living World, Journal of The Trinidad and Tobago Field Naturalists' Club*, 2008: 78.
- Simon, E.** 1894. On the spiders of the island of St. Vincent. II. *Proceedings of the Zoological Society of London*, 1894: 519-526.