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A Preliminary Survey for Spiders on Montserrat, West Indies

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ABSTRACT
During a two-week period in September 2009, a wide variety of habitats on the island of Montserrat, West Indies, were surveyed for the presence of spiders. When compared to the results of previous surveys in the Eastern Caribbean islands, natural habitats in Montserrat at a high altitude showed a higher species richness than those at a lower altitude. Also, like a previous survey in Grenada, Montserrat produced a higher species in natural habitats compared to those that were man-made or influenced by human activity. Members of the families Araneidae and Salticidae comprised almost half of the species found. Twenty-one localities were surveyed from 13 habitats, including five man-made habitats. Seventeen families representing 43 species were collected.

Key words: Spiders, Araneidae, Linyphiidae, Miturgidae, Mimetidae, Oxyopidae, Tetragnathidae, Pholcidae, Sparassidae, Salticidae, Oecobiidae, Plectreuridae, Theridiidae, Thomisidae, Sicariidae, Selenopidae, Scytodidae, Theraphosidae.

Spiders have a worldwide distribution, occupying all land environments except at the polar extremes. Currently there are 41,253 species of spiders that have been named (Platnick 2009). This value is a little over 6,000 above the value given in Levi and Levi (2002) representing what is believed to be close to one-fifth of the total in the world. However, the spider fauna of the Neotropics remains relatively unknown. Also, information on the distribution and diversity of arachnids in the Caribbean as well as northern South America is seriously lacking. Currently, the islands of Barbados (G. Alayón and J. Horrocks, unpubl.), St. Vincent and the Grenadines (Simon 1894, de Silva *et al*. 2006), Anguilla (Sewlal and Starr, *in press*.), Antigua (Sewlal 2009a), Nevis (Sewlal and Starr 2007), St. Kitts (Sewlal 2008) and Grenada (Sewlal 2009b) 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 2009c). Additional information on the family Pholcidae of these islands, including Grenada, Anguilla and St. Kitts was documented by Sewlal and Starr (2008).

Arthropods comprise the most diverse organisms in any terrestrial environment. However, sampling arthropods are particularly challenging due to traits such 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.

I spent two weeks, (14 to 26 September, 2009), on the island of Montserrat conducting a survey of its spider fauna, with the aim of collecting a substantial part of the spider fauna in a broad variety of habitats. Montserrat is one of the northern Leeward Islands in the Eastern Caribbean (16°45'N 62°12'W). It is located approximately 480 km east-south-east of Puerto Rico and 48 km south-west of Antigua. It has an area of 102 km^2 and is volcanic in origin with a maximum elevation of approximately over 930 m. It also has a range of habitats including semi-evergreen forest, montane forest, palm brake, elfin woodland, dry woodland, littoral woodland, and coastal vegetation.

The main collecting methods employed for this survey were sweep-netting and visual search, both at the ground level and above ground, including examining shrubs and low trees. Cryptic microhabitats, like under rocks, rotting logs and bark were also searched during this survey. All specimens that were collected were stored in glass vials in 70% alcohol and labelled. Specimens were identified to species level with the aid of identification keys and microscopy.

During this survey, 21 localities covering 13 habitats were sampled, including five that were man-made habitats or heavily influenced by human activities. The sampling effort produced a total of 43 species belonging to 17 families (Table 1). Three habitats produced the highest number of species, yielding 18, 16, and 15 out of 43 species, which were mangrove, montane and dry forests respectively. Out of all the natural habitats sampled, the palm brake habitat showed the lowest species richness, yielding only five species.

Like Grenada (Sewlal 2009B), Montserrat exhibited higher species richness in natural habitats compared to those that were disturbed or altered by human activities. The recent eruptions and continued activity of Soufriere Hills volcano has led to approximately two-thirds of the island being declared an exclusion zone. Therefore,

Table 1. Showing the species of both Araneomorphae and Mygalomorphae spiders for each habitat sampled in Montserrat during 14th to 26th September, 2009.

Family and Species	Habitat												
	Garden	Roadside	In and on Buildings	Abandoned Buildings	Farmland	Semi-evergreen Seasonal Forest	Montane Forest	Palm Break	Elfin Woodland	Dry Forest	Littoral Woodland	Mangrove	Coastal Veg.
Araneidae *Araneus* sp.	✓										✓		✓
Argiope argentata	✓	✓				✓					✓	✓	✓
Cyclosa walkenaeri	✓	✓											
Eustala anastera	✓	✓				✓	✓			✓		✓	
Gasteracantha cancriformis				✓	✓	✓	✓			✓	✓	✓	✓
Metepeira compsa						✓					✓	✓	✓
Neoscona oaxcensis					✓						✓	✓	
Spilasma sp.							✓						
Linyphiidae cf *Hibana velox*						✓							
Sp. B						✓							
Sp. C									✓				
Miturgidae *Chircanthium inclusum*		✓	✓				✓			✓	✓	✓	✓
Sp. C									✓	✓		✓	
Mimetidae cf *Ero* sp.						✓				✓			
Oecobiidae Sp. A												✓	
Oxyopidae *Oxyopes salticus*												✓	
Pholcidae *Modisimus* sp.							✓	✓	✓	✓			
Physocyclus globosus			✓										
Plectreuridae Sp. A						✓	✓	✓	✓				
Salticidae *Menemerus bivittatus*			✓										
Lyssomanes sp.					✓		✓		✓	✓			
Plexippus paykulli				✓									
Hentzia whitcombi		✓			✓					✓		✓	
Hentzia antillana								✓				✓	

Family and Species	Habitat												
	Garden	Roadside	In and on Buildings	Abandoned Buildings	Farmland	Semi-evergreen Seasonal Forest	Montane Forest	Palm Break	Elfin Woodland	Dry Forest	Littoral Woodland	Mangrove	Coastal Veg.
Sp. A							✓						
Sp. B	✓	✓	✓		✓		✓			✓	✓	✓	✓
Scytodidae *Scytodes fusca*							✓			✓		✓	
Scytodes longipes			✓							✓		✓	
Selenopidae Sp. A						✓							
Sicariidae Sp. A							✓		✓	✓			
Sparassidae *Olios* sp.			✓				✓		✓				
Tetragnathidae *Leucauge argyra*	✓	✓		✓	✓		✓	✓	✓				
Leucauge regnyi		✓			✓	✓	✓				✓	✓	✓
Tetragnatha nitens													
Sp. A													
Theridiidae *Argyrodes elevatus*													
Latodectus geometricus													
Sp. A													
Thomisidae *Misumenops* cf *asperatus*													
Theraphosidae Sp. A													
TOTAL	**6**	**8**	**6**	**3**	**7**	**10**	**14**	**4**	**8**	**12**	**8**	**15**	**7**

only until 19 years ago the south of the island which was sampled in this survey was virtually uninhabited and unaffected by human activity. Therefore, the conditions in these ecosystems can be considered close to pristine, which could account for the high level of species richness and diversity of the natural habitats.

Usually habitats at higher altitudes yield less species because there is less area available and thus less suitable habitat available. However, in this survey more species were found in the lower montane forest habitat compared to the palm brake habitat. Differences in factors such as vegetation structure, temperature or humidity could account for this result.

Roadside vegetation and gardens showed the highest species richness for altered habitats. This is expected, since as with other altered habitats, both habitats provide many and/or suitable points of attachment for families that construct webs to catch their prey. Both habitats also provide a natural path or gap in the vegetation where prey, in particular flying insects, can be blown into webs. Another feature of most altered habitats, in particular on and around houses, that make it a suitable altered habitat for spiders is the presence of artificial lighting which, during the night, attracts flying insects so that nocturnal species have a more or less steady food supply.

Abandoned buildings showed the lowest species richness of disturbed habitats producing only three species. However, most of the ruins on the island were heavily overgrown, thus limiting access to them for sampling.

The families Araneidae and Salticidae produced the most species yielding eight and seven species respectively. However, family Tetragnathidae proved to be the most ecologically diverse being represented in 12 out of the 13 habitats sampled. In terms of individual species, the tetragnathid *Leucauge argyra* was found in ten habitats while an unidentified species of salticid and the araneid *Gasteracantha cancriformis* were recorded from eight and nine 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.

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