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A Preliminary Survey for Spiders on St. Lucia, West Indies

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ABSTRACT

During a two-week period in August 2010, a wide variety of habitats on the island of St. Lucia, West Indies were surveyed for the presence of spiders. As in previous surveys in Grenada and Montserrat, St. Lucia produced more species in natural than in human-made or highly disturbed habitats. Thirteen localities were surveyed from 11 habitats, including five man-made habitats. Twenty-two families representing 40 species were collected. Members of the families Araneidae and Tetragnathidae comprised almost half of the species found.

Key words: Anapidae, Araneidae, Corinnidae, Linyphiidae, Lycosidae, Miturgidae, Mimetidae, Mysmenidae, Oecobiidae, Oxyopidae, Pholcidae, Pisauridae, Salticidae, Sparassidae, Scytodidae, Symphytognathidae, Tetragnathidae, Theridiidae, Theridiosomatidae, Thomisidae, Theraphosidae, Uloboridae.

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 environmental 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 more flexible organisms like vertebrates and plants.

Spiders have a worldwide distribution, occupying all land environments except at the polar extremes. Currently almost 42,000 species of spiders are described (Platnick 2010), representing what is believed to be roughly one-fifth of the total in the world. The spider fauna of the Neotropics remains relatively unknown. 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), Grenada (Sewlal 2009b) and Montserrat (Sewlal 2010a) are the only islands in the Caribbean whose 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, 2010b). Additional information on the family Pholcidae of these islands, including Grenada, Anguilla and St. Kitts was documented by Sewlal and Starr (2008).

I spent two weeks (7 to 21 August, 2010) on the island of St. Lucia conducting a survey of its spider fauna with the aim of collecting a substantial part of the fauna in a broad variety of habitats. St. Lucia is one of the southern Lesser Antilles at (13°53'N, 60°58'W). St. Lucia has an area of 616 km². It is volcanic in origin with a highest elevation of approximately 950 m. It has a range

of habitats including mangrove woodland, littoral woodland, deciduous and semi-evergreen seasonal forest and savanna.

The main collecting methods employed 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. Both collecting methods were employed at each site visited. Each site was visited once due to the time constraints of the project. Only daytime surveys were conducted as nocturnal surveys would have been too dangerous to carry out. All specimens were stored in glass vials in 70% alcohol.

Thirteen localities covering 11 habitats were sampled, including five that were man-made habitats or heavily influenced by human activities. The sampling produced a total of 40 species from 22 families. Secondary vegetation produced the highest number of species (Table 1), while one natural habitat (coastal vegetation) and one human-made habitat (garden) showed the lowest species richness, yielding only four species each. An accumulation curve of the data (Fig. 1) levels off halfway through the sampling but then starts to climb again indicating that additional sampling is needed to document the fauna of this island.

The localities of natural habitats were concentrated in the south and east of the island as they are present in areas large enough to allow for adequate sampling. Also, as most of the localities are not heavily populated or cultivated, the conditions in these ecosystems can be considered close to pristine, which could account for the relatively high level of species richness and diversity of the natural habitats. Out of the natural habitats sampled, coastal vegetation showed the lowest species richness (Table 1), which can be taken as an indication of the

Table 1. Showing the species of both Araneomorphae and Mygalomorphae spiders for each habitat sampled in St. Lucia for the period 7th to 21st August, 2010.

| Family and Species | Habitat | | | | | | | | | | | |
|--|---------|---------------------|----------|----------|----------------|---------------|------------------|-----------------------|----------------------|----------|-------------------|--------------|
| | Garden | In and on Buildings | Roadside | Farmland | Secondary Veg. | Riparian Veg. | Deciduous Forest | Semi-evergreen Forest | Lower Montane Forest | Mangrove | Littoral Woodland | Coastal Veg. |
| Anapidae Sp. A | | | ✓ | | | | | | | | | |
| Araneidae <i>Acacesia</i> c.f. <i>hamata</i> | | | | | | | | ✓ | | | | |
| <i>Argiope argentata</i> | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | | ✓ | | ✓ |
| <i>Cyclosa caroli</i> | ✓ | | | | ✓ | ✓ | | ✓ | ✓ | | | |
| c.f. <i>Eustala anastera</i> | | | | | | | ✓ | ✓ | | ✓ | | ✓ |
| <i>Eustala fuscovittata</i> | | | | ✓ | | | | | | | | |
| <i>Gasteracantha cancriformis</i> | | | | | ✓ | ✓ | | | | | | |
| <i>Metepeira compsa</i> | ✓ | ✓ | | | | | | | | | ✓ | ✓ |
| <i>Neoscona neothesis</i> | | | ✓ | ✓ | | | | | | | | |
| Corinnidae Sp. A | | | | | | | | | | ✓ | | |
| Linyphiidae Sp. A | | ✓ | | | | | | | | | | |
| Lycosidae Sp. A | | | | | | | | | ✓ | | | |
| Mimetidae Sp. A | | | | | | | | | | | ✓ | |
| Miturgidae c.f. <i>Cheracanthium</i> sp. | | | | | | | | | | ✓ | | |
| Mysmenidae Sp. A | | | | | | | | ✓ | | | | |
| Oecobiidae Sp. A | | ✓ | | | | | | | | | ✓ | |
| Oxyopidae <i>Oxyopes salticus</i> | | | ✓ | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | |
| Pholcidae Sp. A | | | | | | | | ✓ | | | | |
| <i>Modisimus</i> sp. | | | ✓ | | ✓ | | | | ✓ | | | |
| <i>Physocyclus globosus</i> | | ✓ | | | | | | | | | | |
| Pisauridae Sp. A | | | | | | ✓ | | | | | | |

| Family and Species | Habitat | | | | | | | | | | | |
|----------------------------------|----------|---------------------|-----------|----------|----------------|---------------|------------------|-----------------------|----------------------|----------|-------------------|--------------|
| | Garden | In and on Buildings | Roadside | Farmland | Secondary Veg. | Riparian Veg. | Deciduous Forest | Semi-evergreen Forest | Lower Montane Forest | Mangrove | Littoral Woodland | Coastal Veg. |
| Salticidae | | | ✓ | | | | | | | | ✓ | |
| Sp. A | | | | | | | | | | | | |
| Sp. B | | ✓ | | | | | | | | | | |
| Sp. C | | | ✓ | ✓ | | | ✓ | ✓ | | | ✓ | |
| Sp. D | | | | | ✓ | | | | | | | |
| <i>Lyssomanes</i> sp. | | | | | | | | ✓ | | | | |
| Scytodidae | | | | | | | | | | ✓ | | |
| <i>Scytodes longipes</i> | | | | | | | | | | | | |
| Sparassidae | | | ✓ | | ✓ | | ✓ | | ✓ | ✓ | | |
| " <i>Olios</i> " sp. | | | | | | | | | | | | |
| Symphytognathidae | | | | | | | | | | ✓ | | |
| Sp. A | | | | | | | | | | | | |
| Tetragnathidae | | | ✓ | | | | ✓ | | ✓ | | | |
| <i>Aleimosphenus licinus</i> | | | | | | | | | | | | |
| <i>Leucauge argyra</i> | ✓ | | ✓ | ✓ | ✓ | ✓ | | | | | | |
| <i>Leucauge regnyi</i> | | | ✓ | | ✓ | ✓ | ✓ | ✓ | ✓ | ✓ | | |
| <i>Tetragnatha nitens</i> | | | | | | ✓ | | ✓ | ✓ | | | |
| Theridiidae | | | | | ✓ | | | | | | | |
| Sp. A | | | | | | | | | | | | |
| <i>Argyrodes elevatus</i> | | | | ✓ | | ✓ | ✓ | ✓ | ✓ | | | ✓ |
| Theridiosomatidae | | | ✓ | | ✓ | | | | | | | |
| Sp. A | | | | | | | | | | | | |
| Theraphosidae | | | | | ✓ | | | | | | | |
| Sp. A | | | | | | | | | | | | |
| Thomisidae | | | | ✓ | | ✓ | | | ✓ | | ✓ | |
| c.f. <i>Misumenops asperatus</i> | | | | | | | | | | | | |
| Uloboridae | | | | | ✓ | | | | ✓ | | | |
| <i>Miagrammopes</i> sp. | | | | | | | | | | | | |
| <i>Uloborus pencillatus</i> | | | | | ✓ | | | | ✓ | | | |
| TOTAL | 4 | 6 | 12 | 8 | 13 | 10 | 8 | 11 | 12 | 9 | 7 | 4 |

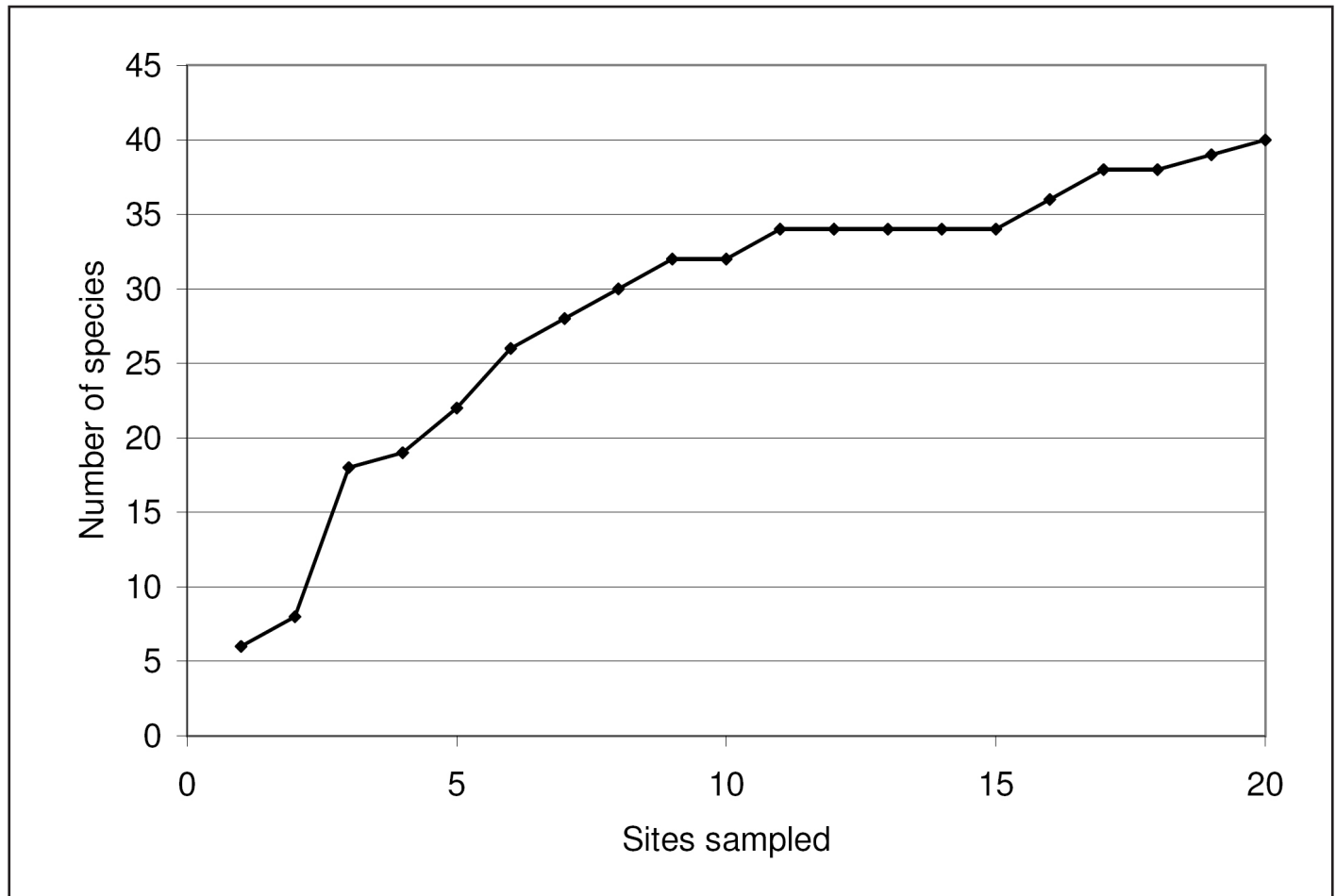


Fig. 1. Species accumulation curve of the species of both Araneomorphae and Mygalomorphae spiders for each habitat sampled in St. Lucia for the period 7th to 21st August, 2010.

harsh conditions found in this habitat, especially the constant exposure to strong winds.

With respect to secondary vegetation, the disturbance caused by logging of trees of commercial importance has constantly created new niches while some areas have remained undisturbed for decades, so that both generalist and specialist species can be found in these habitats, which in turn translates to high species richness. This is most likely, since as with other altered habitats, they 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. Another feature of most altered habitats is the presence of artificial lighting during the night which attracts flying insects, so that nocturnal species have a more or less steady food supply. However, gardens showed the lowest species richness of disturbed habitats producing only four species. A possible explanation for this is the use of pesticides in this habitat during the course of their maintenance.

The families Araneidae, Oxyopidae and Tetragnathidae were the most species rich yielding 9, 8 and 7 species respectively. Araneidae and Tetragnathidae were also the two most ecologically diverse families containing species collected from 11 and 9 habitats respectively. Species from nine families were found in single habitats, four of which were collected from mangrove woodland. This indicates that out of the natural habitats sampled, mangrove woodland had a unique species composition. However, this is a preliminary survey so that with further sampling more species from those families could be found in other habitats on the island.

Specimens from the Mygalomorphae group, or tarantulas commonly referred to locally as “Matutu”, were collected from disturbed forest habitats.

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