Habitat Specificity of Selected Spiders of Dominica

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Abstract

This study was conducted to determine the habitats preferences of common orb and cobweb weaving spiders of Dominica. Spiders were collected in the field and photographed for identification purposes, and data was analyzed on locations each species was found in. Common families included Tetragnathidae, Pholcidae, and Araneidae. Tetragnathidae preferred locations either near water, in shaded vegetation, or logs, trunks, or buttresses of trees. Pholcidae shared both these habitats but was also found in only partially shaded vegetation. Araneidae included species whose webs were usually made in full sun or partial shade. Descriptions of less common spider species are also included.

Introduction

Dominica is a tropical island in the Eastern Caribbean home to a wide range of flora and fauna. Arachnids, and araneaeids in particular, are also abundant. This study was conducted to find out more about Dominica's spider population. Research questions asked were:

- What orb and cobweb weaving araneaeid families and species are common to Dominica , and
- In what habitats do they reside?

There are many distinct areas on this mountainous island. Those included in this research are dry scrub woodland, cultivated and disturbed land, transitional forest, and rain forest (Evans et. al., 1997).

Materials and Methods

Stage one involved collecting the different species for photographs and examination. At this point environments were not specifically noted, but hikes into primary and secondary forest, near rivers, streams, and shallow ponds, and into full-sun roadsides and clearings yielded all specimen types. Any interesting behaviors were noted throughout this stage. Specimens were collected by hand into one of two sizes of plastic vial for return to the lab.

Collected specimens were photographed live with a Nikon D1X and various macro lenses. Views were dorsal (with one exception taken post mortem). Common species were analyzed under a dissecting microscope and distinguishing characteristics were drawn and described for large spiders. Characteristics included chelicerae, eye pattern, spinnerets, lateral opisthosoma shape, lung slits, epigynum of females, and pedipalps of males. Specimens less than 0.5 cm in size were not dissected due to technical difficulty involved. At this point family, genus, and species (if possible) were discerned with the help of A Field Guide to Spiders and Scorpions of Texas (1997) and Spider Genera of North America, 3rd ed.

Stage three included going on planned hikes to record location data for each species. Trips down the Checkhall River and throughout the secondary forest and old regrowth areas of Springfield Research Station were taken specifically for data collection.

For each of the hikes, instances of each species in the five categories (full sun vegetation, partial shade vegetation, full shade vegetation, shaded trunks, buttresses, and logs, and over/near water) were recorded for later analysis.

Materials for this study were minimal. Those not previously mentioned are: ethyl alcohol, forceps, and glass viewing plate for dissection and pens and paper for initial data recording.

Results and Discussion

Tetragnathidae

The most prevalent spider family found was Tetragnathidae. Two species found commonly were *Tetragnatha elongata* and *Leucauge venusta*. A third, *Alcimosphemus licinus*, was seen only once.

Tetragnatha elongata

Tetragnatha elongata, as the name implies, is slender, elongate spider (See **Figure 1**). All specimens presented with a muted, mottled brown coloring. This was also one of the species chosen for dissection. Refer to **Table 1.1** for diagrams of prominent features with descriptions.

This species was found almost exclusively over and around streams and pools (see **Figure 12**). A single instance of a spider hanging on a brown vine approximately 15 yards from a water source was the only exception. Spiders would build relatively simple horizontal orbs spanning between rocks or vegetation over running or still water. A

notable trait is their docile nature. Up to eight spiders of varying sizes were seen sharing the same large, connected web. They also tolerated handling for photographs well.

Figure 1: *Tetragnatha elongata* female in a characteristic pose

Leucauge venusta

These spiders were relatively small with brightly colored patches on a black background. Sexual dimorphism was observed. Females were much larger and color patterns were easily distinguished. Evidence of this was first noticed during observation of a mating pair. Upon collection the male was quickly attacked and killed. On that note, *Leucauge venusta* was a much more active spider, and there were no shared webs. For photographs of both sexes see **Figures 2.1-2** below; see **Table 1.2** for characteristic diagrams.

As shown in **Figure 13**, habitat overlap occurred between this species and both *Tetragnatha elongata* and *Physocyclus globosis*. They were present in large numbers over water, on tree trunks, buttresses, logs, and on vegetation in partial shade. Webs were medium size, intricate orbs.

Figure 2.1: large female *Leucauge venusta*

Figure 2.2: juvenile *Leucauge venusta*

Alcimosphemus licinus

This spider should not be considered common; it was only seen once. However, it falls within Tetragnathidae family and it is quite interesting. The specimen below (**Figure 3.1-2** and **Table 1.3**) was picked from vegetation in partial shade.

Figure 3.1: female *Alcimosphemus licinus* showing lateral spots

3.2: same spider, dorsal view

<u>Pholcidae</u>

Pholcidae was also abundant. Species is not definite, but *Physocyclus globosis* is the most likely candidate. The globular abdomen best fits this species description (Jackman, 1997). See **Table 1.4** for distinguishing characteristics and **Figures 4.1-3** for photographs. Two varieties were noticed; one was a muted grey-brown and the other a light yellow-green.

These were also located over and around water, but were present on vegetation and tree buttresses in shaded areas as well (see **Figures 14-15**). The green color was observed mainly in bright vegetation, while the duller type resided on any color vegetation and rocks alike. This could serve as a camouflage function.

Figure 4.1-2: green pholcid variety

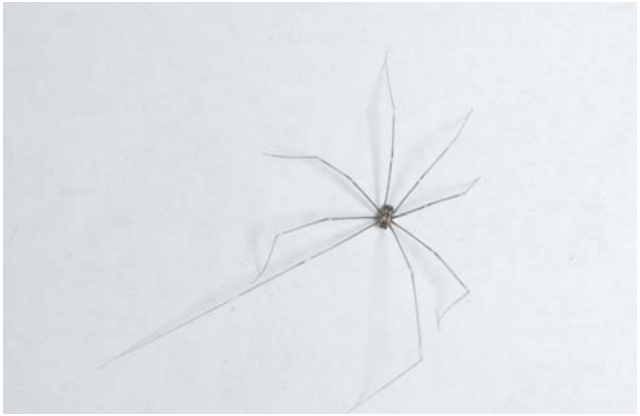


Figure 4.3: brown pholcid male

<u>Araneidae</u>

Family Araneidae was less common in shaded areas. Two genera were found commonly: Argiope and Gasteracantha. Both types preferred sunnier spots such as roadsides and areas with light regrowth.

Argiope argentata

One species, *Argiope argentata*, was found multiple times. It is large and brightly colored with yellow, black, and silver. At rest on its web it would position its legs grouped into pairs. See **Figure 5** below; characteristics are given in **Table 1.5**.

Preferred habitat was full sun, but spiders were also found in partial shade (see **Figure 16**). They were most common in light regrowth areas and near roadsides.

Figure 5: *Argiope argentata* female in a disturbed position

Gasteracantha

Gasteracantha cancriformis

This spider has short legs which are usually held tucked under its spiny abdomen. It is slow-moving and easily manipulated. The common species is white with red tips to

the spikes. Spine length varied slightly between individuals. See **Figures 6.1-2** below and **Table 1.6** for characteristics. *Gasteracantha cancriformis* was found in trunks, logs, and tree buttresses as well as partial shade (see **Figure 17**).

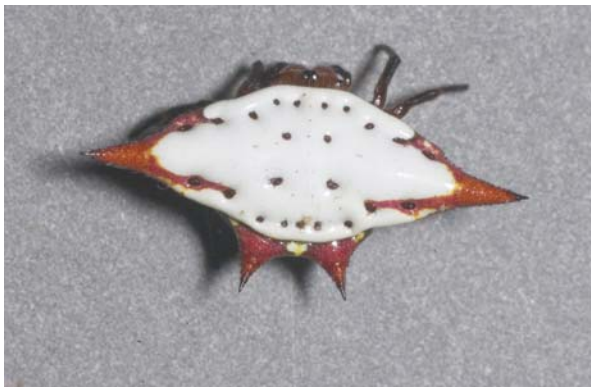


Figure 6.1: female *Gasteracantha cancriformis* dorsal view

Figure 5.2. ventral view showing yellow spots

Gasteracantha sp.

An unknown species of Gasteracantha was spotted twice. Once again, not enough to be considered common in this study. The habitat in which it was found was similar to that of *Gasteracantha cancriformis.* See **Figure 7**.

Figure 7: female *Gasteracantha sp.*

Cyclosa turbinata

This small spider displays muted color and holds legs somewhat close and over its body at rest (see **Figure 8** below). It's body is somewhat narrow and elongated.

It was found regularly in shade and partial shade (see **Figure 18**). An interesting behavior is its web design, which is "adorned with remnants of prey and old shed skins" (Foelix, 1996). The spider is hidden at the bottom of this line of debris. Also notable is its habit of dropping quickly from that position when disturbed.

Figure 8: female *Cyclosa turbinata*

Unknown Araneidae

Other species only noticed once each are shown below (**Figures 9-10**). Species names are only approximate on these individuals.

Figure 9: small *Araneus* sp. moving across table

Figure 10: post mortem shot of spider similar to *Uloborus glomosus*

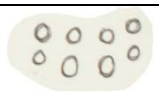
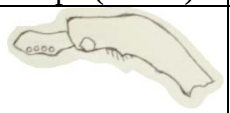
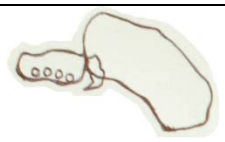
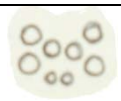
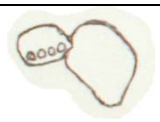
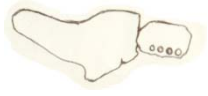
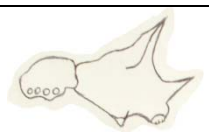
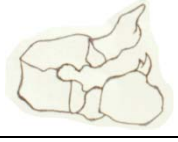
Theridiidae

A fourth family was Theridiidae, the cobweb-weavers. It was the least common according to data. Only one species, *Theridion frondeum*, was numerous enough to be significant (see **Figure 11)**.

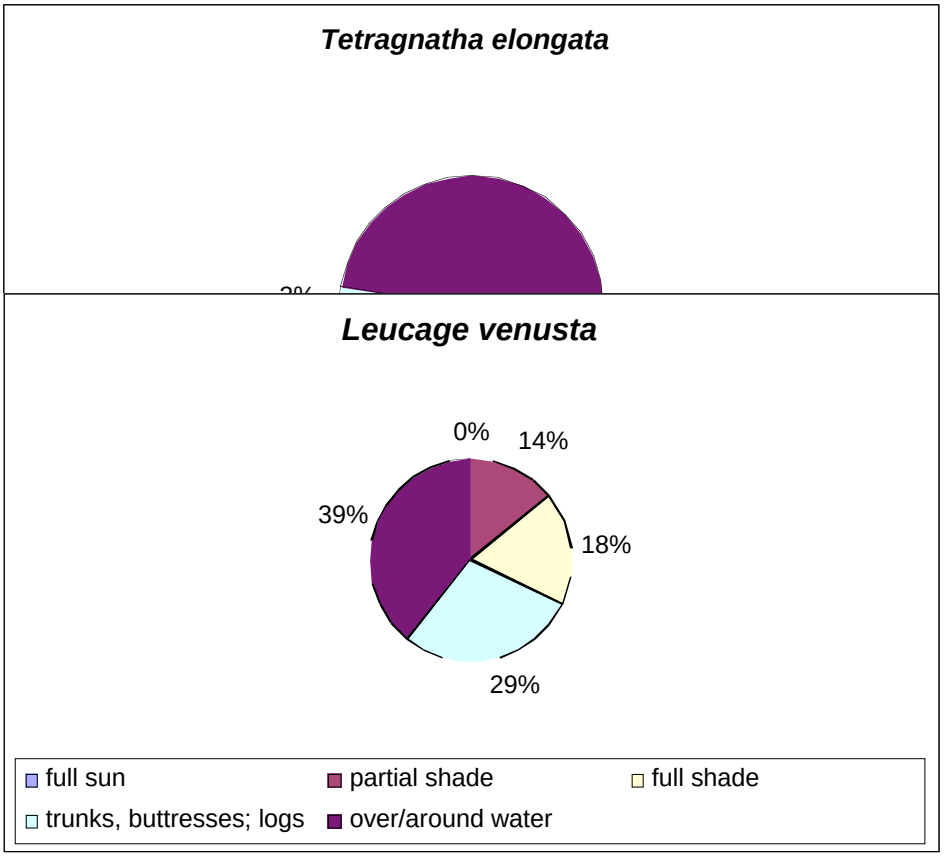
This spider was found residing in man-made structures such as gates and under eaves in partial shade. It was not seen on any of the hikes.

Figure 11: female *Theridion frondeum*, note combs on legs

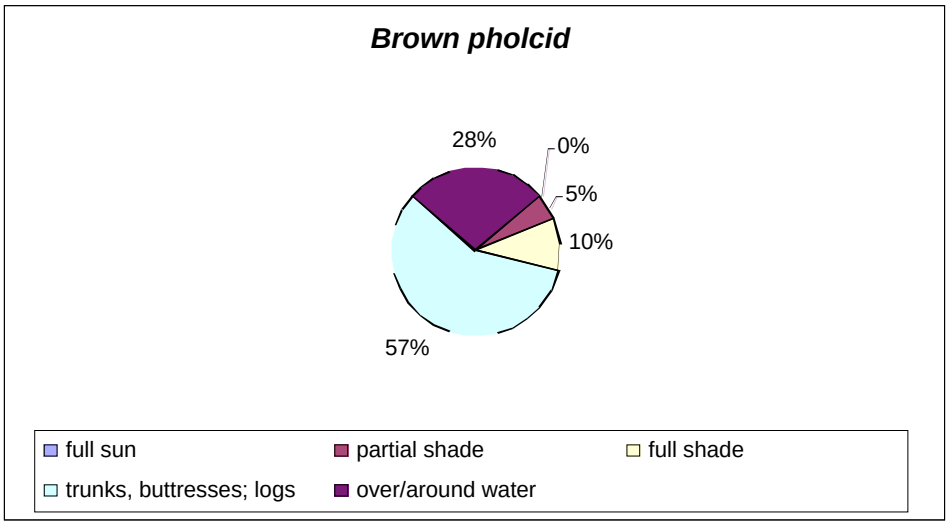
Data

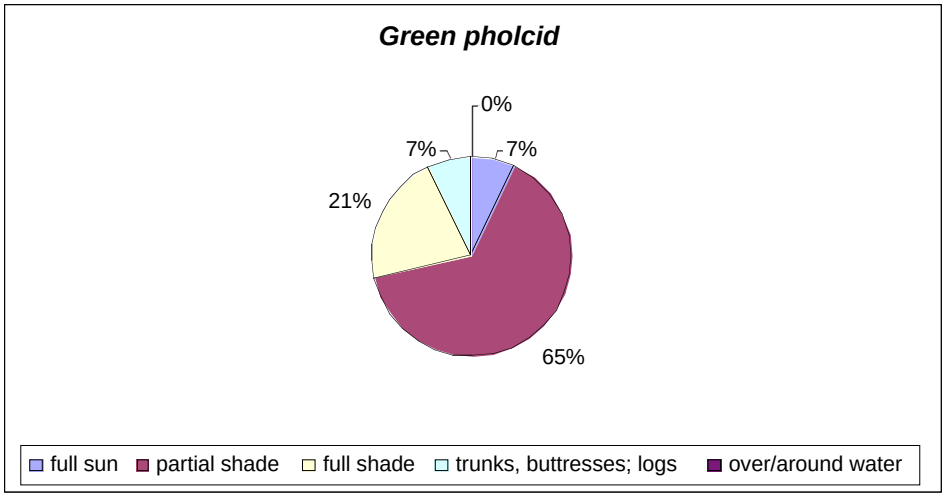
Spider Species	Eye Pattern	Chelicerae	Pedipalps (males)	Opisthosoma Shape (lateral)	Spinnerets
Tetragnatha elongate ***(Chart 1.1)***			NA		
Leucage venusta ***(1.2)***			NA		NA
Physocyclus globosis ***(1.3)***			NA		NA
Argiope argentata ***(1.4)***			NA		NA
Gasteracantha cancriformis ***(1.5)***			NA		
Alcimosphemus licinus ***(1.6)***					

Figures 12-13: Shows distribution of common Tetragnathid species. Note *Tetragnatha elongata*'s definite preference for habitat near or above water. Also note habitat overlap between the two major species.

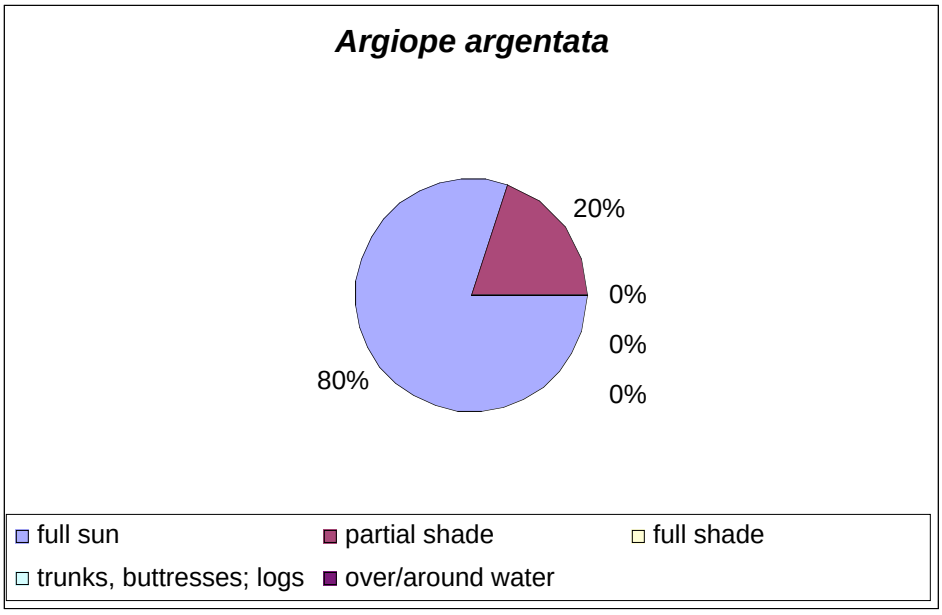


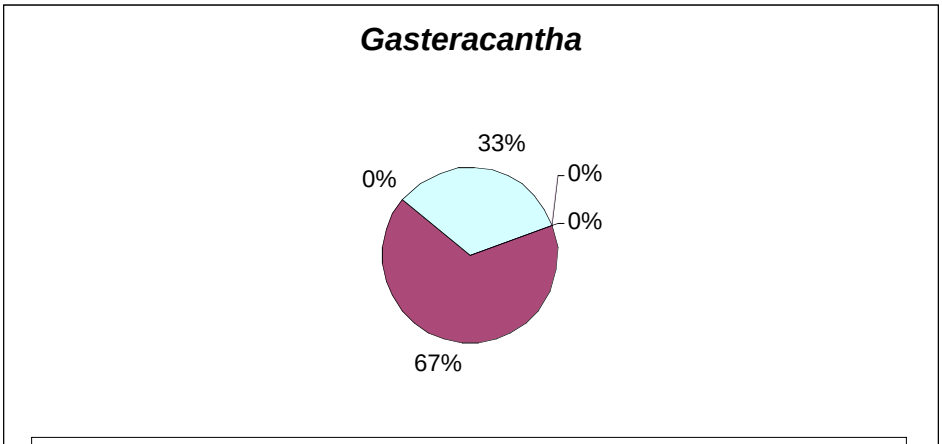
Figures 14-15: Compares habitat preferences for each color variation.

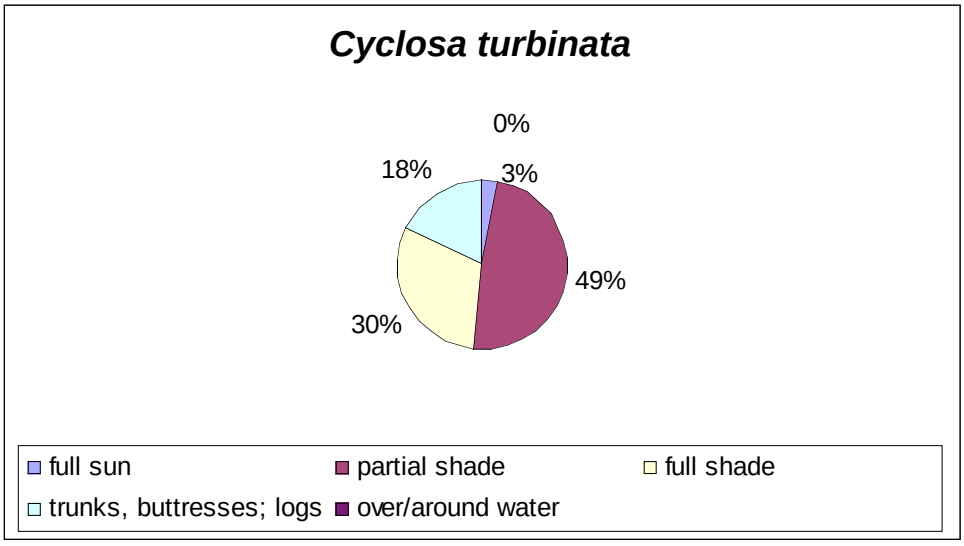




Figures 16-18: Note different habitat preferences for the Araneidae common species. Full sun is the largest portion for *Argiope argentata*.







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