A Survey of the Hemiptera Fauna on the Island of Dominica

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Abstract

In this study, insects from the order Hemiptera were collected using six different collection methods at ten different locations across the island of Dominica, West Indies. Four hundred and sixty four specimens within twenty three different families of the order Hemiptera were collected by the use of a mercury vapor light trap, a black light trap, a sweep net, a beating sheet, a Malaise Trap, and by hand collection. The collection methods, brief descriptions of each family, and analysis of collection technique is provided.

Key Words: Dominica, West Indies, Hemiptera, Heteroptera, Auchenorrhyncha, Sternorrhyncha

Introduction

The order Hemiptera is very diverse in its phenotypic characteristics. Members of the order Hemiptera are identified by a unique piercing-sucking mouthpart. Four piercing stylets, the paired maxillae and mandibles, makeup the mouthpart. These piercing-sucking mouthparts are most often used for sucking plant sap or blood (Triplehorn and Johnson 2005). There are three suborders within Hemiptera: Heteroptera, Auchenorryhncha, and Sternorrhyncha.

Triplehorn states that the suborder Heteroptera is signified by the presence of hardened basal front wings (if present), beak arising from the front of the head, four or five segmented antennae, and the presence of two or three tarsal segments (generally). The suborder Auchenorrhyncha is uniquely identified by the origin of the beak coming from the back of the head, "position of the ocelli, characteristics about the ocelli, form of the pronotum, and lastly the spination of the legs." The suborder Sternorrhyncha is uniquely identified by the origination of the beak coming from between the procoxae, the tarsal and antennal segment count, and wing specifics. Sternorrhynchans are especially unique in that they can involve bisexual and parthenogenetic generations and individuals with and without wings (Triplehorn and Johnson 2005).

The aim of this study is to do a thorough survey of the Hemipteran fauna on the island of Dominica, West Indies. Dominica is extremely diverse in habitat compared to its small size (800 square kilometers). A large diversity in the Hemipteran fauna was expected throughout the range of habitats including, but not limited to, cloud forest, mountain thicket, plantations, and gardens

(Evans 1997). A secondary purpose of this study was to do a comparison and analysis on the relative efficiency of different collection methods.

Materials and Methods

A thirteen day study was conducted on the island of Dominica, West Indies, from May 21 to June 3, 2009. Most of the survey took place at the Archbold Tropical Research and Education Center (ATREC), Springfield (15°20’33.9”N 61°22’41.4”W). Several collecting methods were used including a light sheet lit by a mercury vapor light, a light sheet lit by a black light, a sweep net, a beat sheet and beat pole, malaise traps, and by hand. Pan traps were used but they resulted in no Hemiptera specimens. Ten different collections were conducted, distinguished both by method and location.

The first collection took place between May 21 and May 24, 2009 at the Archbold Tropical Research and Education Center (henceforth referred to as ATREC), Springfield on the Massacre Trail (15°20’33.9”N 61°22’41.4”W). A BioQuip® beating sheet was used on this trail. A beating sheet is composed of two parts. The first part has a shallow net formed by a thick canvas material strung through an oval hoop. The oval hoop is attached to a short wooden stick. The second part of the beating sheet set is a small wooden pole. The beating sheet set functions by placing the net below a tree or shrub and whacking said tree or shrub with the separate pole. Specimens which normal attach themselves firmly to vegetation fall more easily into the net. The specimens are then sucked into a BioQuip® Aspirator and stored there until they can be killed and processed.

The second collection took place between May 21 and May 27, 2009 at ATREC, Springfield on the back patio (15°20’33.9”N 61°22’41.4”W). The collection method was a white bed sheet lit by a mercury vapor light. The white bed sheet was hung by a rope, duck tape, and close pins. The 220 v mercury vapor light was then suspended about six inches away from the white sheet and turned on. The mercury vapor light was plugged into an extension cord, and then into the 220 volts wall cord. Insects are attracted to the mercury vapor light. They land on and around the lit sheet. The insects are then collected either by hand and placed directly into containers for future processing or are sucked up using a BioQuip® Aspirator for future processing.

The third collection took place between May 25 and May 27, 2009 at ATREC, Springfield on the trail to Mt. Joy (15°20.58’N 61°21.50W). The collection method was the use of a BioQuip® sweep net. A sweep net is a deep flowing net made of a white mesh fabric. The sweep net is used by sweeping it over vegetation in a swooping pattern. The specimens caught in the net are then sucked up using a BioQuip® Aspirator. They are stored in the Aspirator until further processing.

The fourth collection took place on May 26, 2009 at Cabrits National Forest (15°20.586'N 61°22.472W). The collection method was simply by hand. The insect was spotted on the side of a trail and was immediately placed in a vial for killing and further processing.

The fifth collection took place on May 27, 2009 at the ATREC Springfield by the Bee House (15°20.749'N 61°22.147W). The collection method here was the use of the white bed sheet strung up by a rope and duck tape, lit by a mercury vapor light. The mercury vapor light was powered, once again, by a combination of an extension cord and the 220 volt outlet. The insects are attracted to the mercury vapor light and land on the lit sheet and surrounding area. Insects are collected either by hand or by the use of a BioQuip® Aspirator.

The sixth collection took place on May 27, 2009 at ATREC Springfield by the Bee House (15°20.749'N 61°22.147W). The collection method was by simple sight and hand capture. The insect was spotted on a patch of lemon grass and was immediately placed in a vial for further killing and processing.

The seventh collection also took place on May 27, 2009 at ATREC, Springfield but on the back patio (15°20'33.9"N 61°22'41.4"W). The collection method, once again, was simply by sight and capture. The insects were spotted at night on the surface of a Burlese Funnel. The insects were attracted to the bulb lighting the funnel. The insects were immediately placed into a funnel for killing and processing.

The eighth collection took place between May 23 and May 31, 2009 at Middleham Forest (15°34887'N 61°33896'W) at an elevation of 652.3 m. The collection method was by the use of a Ground Malaise Trap. The trap essentially forms a bottomless tent of a breathable small mesh material. The mesh forms two conjoining triangles leading to a opening in the top point that spills into a plastic bottle three quarters full of ethyl alcohol (EtOH). The insects are caught on the mesh during flight other form of travel. They then crawl upwards and fall into the ethyl alcohol and die. The Malaise Traps are left out for whatever window of time, in this case nine days. The traps are staked down and tied to neighboring trees for support. The specimens are preserved in the ethyl alcohol until collection, after which they are analyzed.

The ninth collection took place on May 31 and June 2, 2009 at ATREC, Springfield (15°20'33.9"N 61°22'41.4"W) by the Checkhall River and the Springfield Garden, respectively. The collection method was by the use of a white bed sheet hung by rope and duck tape lit by a 15 watts black light. The black light was powered by the use of a 12 volt car battery. The insects are attracted to the black light bouncing off the white sheet. Insect were collected off the sheet either by the use of vials (for larger insects) or they were sucked up using a BioQuip® Aspirator.

The tenth collection took place between May 26 and June 2, 2009 at the Cabrits National Forest (15°20.586'N 61°22.472W). The collection method was a Ground Malaise Trap set out for eight days in the forest. The structure and process is exactly the same as discussed in collection eight.

The eleventh collection took place at ATREC, Springfield (15°20'33.9"N 61°22'41.4"W). The collection method was by the use of another Ground Malaise Trap, the Malaise Trap in this series of collections. The structure and process is exactly the same as discussed in collection eight.

Collected specimens were either placed in vials filled with ethyl alcohol (EtOH) and labeled with label paper written by a Pigma Pen, pinned through the scutellum, or pointed on a paper product point with Elmer's Glue that had be left out long enough to get tacky. All pinned and pointed specimens were immediately placed with a locality label and placed in a Schmidt box surrounded by moth balls. The moth balls kept always all ants, dermestids, and other insects that would destroy such a collection. The insects were analyzed by the use of the Borror and Delong Key (Triplehorn and Johnson 2005) and Leica stereo-microscopes. Voucher specimens of all material collected in this project have been deposited in the Insect Collection, Archbold Tropical Research and Education Center, Springfield, Dominica.

Results

A total of four hundred and sixty four specimens across 23 families were collected and identified. Table 1 shows the breakdown of how specimens were collected and what family they belong to. It shows the total number of specimens collected within each family. Table 1 also shows the total number of specimens collected by each collection method; note the difference in collection method and collection trip. Note that the total number of specimens collected for each Cicadellidae subgroup was not used to calculate the total number of specimens present.

Figure 1 is a visual representation of the total number of individuals collected within each of the twenty three families. Figure 2 is a visual representation of the total specimens collected by each collection method.

Table 1

Total Numbers of Hemiptera Collected with a breakdown of collection method

May 21, 2009 through June 03, 2009

Suborder	Infraorder	Superfamily	Family	MV Light	Black Light	Sweep	Beat Sheet	Malaise Trap	Hand Collect	Total
Heteroptera	Gerromorpha	Gerroidea	Veliidae						48	**48**
			Gerridae						10	**10**
	Nepomorpha	Naucoroidea	Naucoridae						9	**9**
	Cimicomorpha	Reduvioidea	Reduviidae						1	**1**
			Miridae	5			4	2	6	**17**
		Tingoidea	Tingidae	1			3			**4**
		Cimicoidea	Nabidae	15	1	3		2		**21**
	Pentatomomorpha	Pentatomoidea	Pentatomidae	8			1		1	**10**
			Scutelleridae	8					1	**9**
		Lygaeoidea	Rhyparochromidae	1		1	1		1	**4**
			Lygaeidae	9						**9**
			Heterogastridae	3		2	6		6	**17**
		Pyrrhocoroidea	Pyrrhocoridae	15					1	**16**
		Coreoidea	Coreidae						1	**1**
Auchenorrhyncha		Cicadoidea	Cicadidae	13						**13**
			Cercopidae	3				1		**4**
			Membracidae	2						**2**
			Cicadellidae Total	13	1	6	13	142	7	**182**
			Subgroup A	13	1	6	13	1	7	**X**
			Subgroup B					107		**X**
			Subgroup C					34		**X**
		Fulgoroidea	Delphacidae	2					1	**3**
			Cixiidae	4	1			52		**57**
			Issidae	1		1		15		**17**
			Flatidae	1			1	1		**3**
Sternorrhyncha		Psylloidea	Psyllidae					7		**7**
Total				**117**	**4**	**19**	**42**	**364**	**100**	**464**

Figure 1:

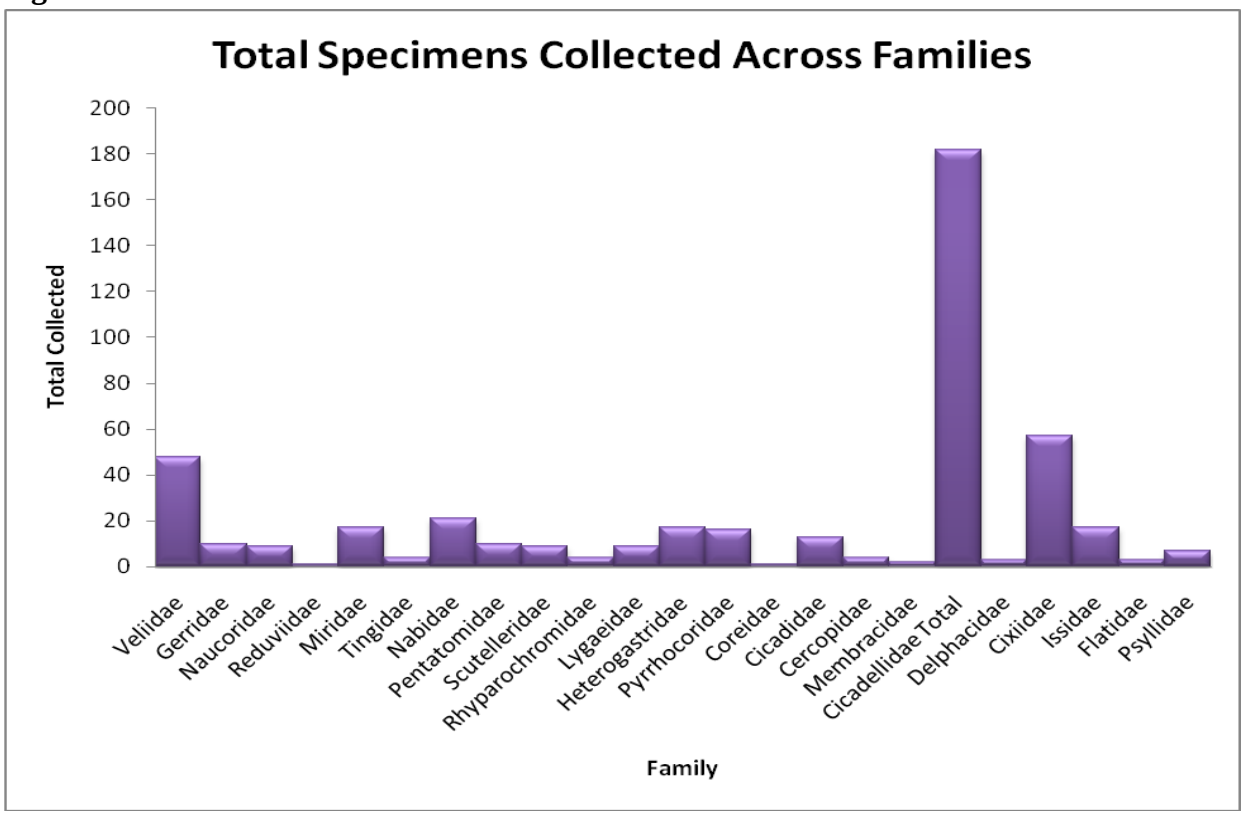
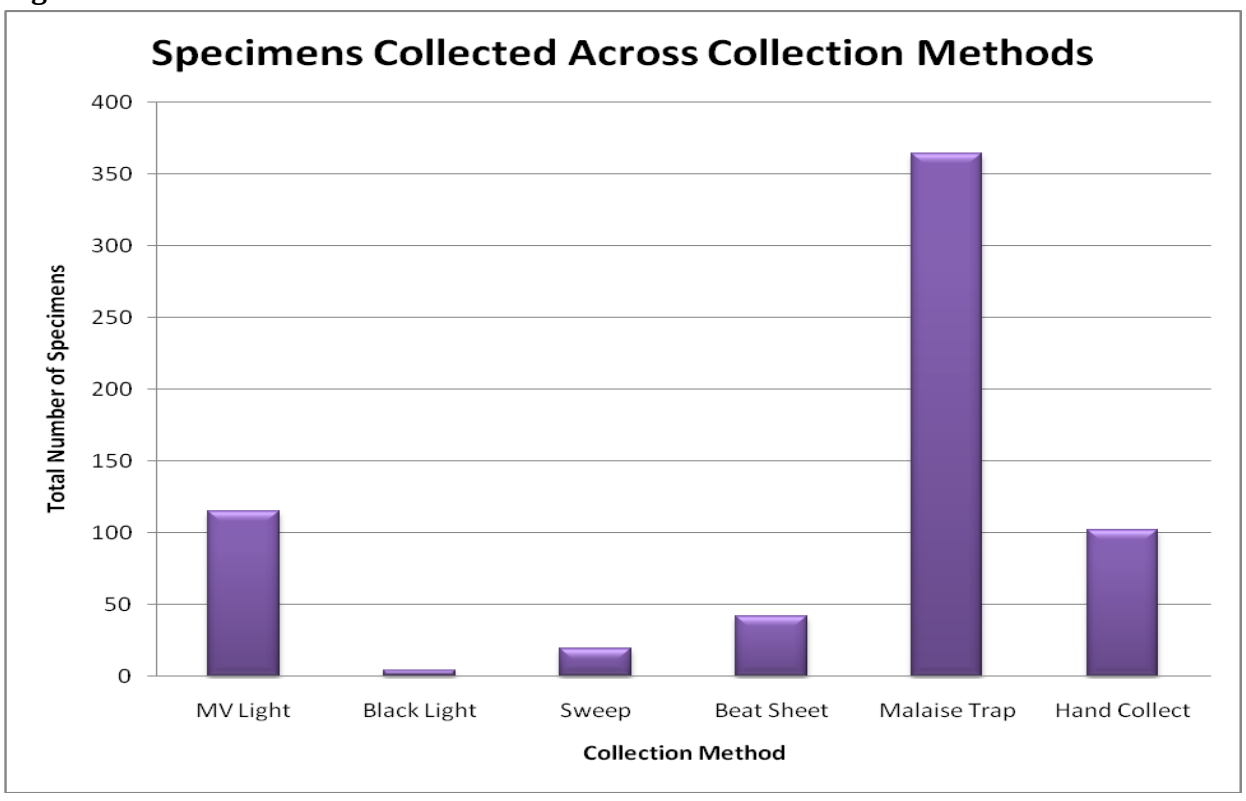


Figure 2:



Discussion

Dominica, West Indies is an island of less than 800 square kilometers. Dominica is extremely diverse in habitat for its small size. There are habitats that can range from "cloud forest, mountain thicket, tall stands of rain forest to a drier scrubbier woodland, and interspersed amongst these are lakes, rock canyons, rivers and waterfalls, plantations and gardens" (Evans 1997). This diverse range in habitat provides an even more diverse array of Hemipterans.

The families Veliidae and Gerridae are under the suborder Heteroptera, the infraorder Gerromorpha, and the superfamily Gerroidea. Members of the infraorder Gerromorpha are mostly aquatic. They have prominent antennae and three pairs of trichobothria on the head (Triplehorn and Johnson 2005).

The family Veliidae (Figure 3) is more commonly known as broad-shouldered water striders. Veliids are relatively small (1.6-5.5 mm long). They are often black or dark brown and are mostly wingless. They are found skating on the surface mostly around the water's edge, though some can be found in and around small water riffles. Veliids feed mostly on smaller insects (Triplehorn and Johnson 2005). In this research project, all forty eight veliids found were hand collected in lotic pools (Table 1). Collected by hand is the best collection method for veliids. The help of aquatic nets are useful while in streams.

Figure 3: Veliidae

The family Gerridae (Figure 4) is more commonly known as water striders. Gerrids are larger than Veliids. They have long legs and tarsi laced with fine hairs which they use to skate on the surface of the water. Gerrids are mostly restricted to quiet fresh water pools. Aided by their front pair of legs, gerrids feed on insects that fall in the water (Triplehorn and Johnson 2005). All ten gerrids found in this project were, like the veliids, hand collected in lotic pools (Table 1). Collecting by hand is the best collection method for gerrids. As stated before, the help of aquatic nets are useful while in streams.

Figure 4: Gerridae

The family Naucoridae is a member of the suborder Heteroptera, the infraorder Nepomorpha, and the superfamily Naucoridae. Members of the infraorder Nepomorpha are most always aquatic. They have inconspicuous antennae and have absent trichobothria.

The family Naucoridae (Figure 5) are more commonly known as the creeping water bugs. Naucorids are most often brown, flattened, and oval. They have greatly enlarged front femora which aid them in feeding on other aquatic animals. They mostly inhabit quiet pools and can sometimes be found in small streams (Triplehorn and Johnson 2005). Nine nacourids were found throughout this project. All were found in the Bee Pond, which is a lotic pool full the *Hydrilla verticillata* plant. Collection by hand is the best for nacourids.

Figure 5: Naucoridae

The families Reduviidae, Miridae, Tingidae, and Nabidae are all member of the suborder Heteroptera and the infraorder Cimicomorpha. Cimicomorphans are all terrestrial. Most all have prominent antennae and have trichobothria. They feed mostly on plant sap, fruits, seeds, or blood in some cases (Triplehorn and Johnson 2005).

The family Reduviidae (Figure 6) is a member of the superfamily Reduvioidea. Reduviids are more commonly known as assassin bugs, ambush bugs, and thread-legged bugs. Reduviids can be readily identified by their elongated head which ends narrowly in what looks like a neck. They have a sort three segmented beak which fits into a groove in the prosternum. All reduviids are predaceous and can impose a painful bite. The only adult reduviid found was on a *Cymbopogon* (Lemongrass) plant. There were approximately five other reduviids also on this *Cymbopogon* plant, but they were not collected because they were not adults.

Figure 6: Reduviidae

The family Miridae (Figure 7) is a member of the superfamily Miroidea. Mirids are more commonly known as plant bugs or leaf bugs. Members of the family Miridae are easily recognized by the presence of a cuneus on their front wing, a few closed cells at the base of the membrane, and the lack of ocelli (for most). Mirids can feed on both plants and other insects. Five mirids were collected at a mercury vapor light, four collected with a beat sheet, two with Malaise Traps, and size by hand (Table 1). The best collection method for mirids, as observed in this project, is collection by hand. Though, mercury vapor lights proved to be productive as well.

Figure 7: Miridae

The family Tingidae (Figure 8) is a member of the superfamily Tingoidea. Tingids are more commonly recognized by the name lace bugs. Tingids are very small (less than 5mm in length). Adult tingids are easily recognized by the elaborate lace-like dorsal view of their wing design. Tingids are plant feeders and cause significant damage to certain vegetation (Triplehorn and Johnson 2005). One tingid was found at a mercury vapor light and three were collected with a beating sheet (Table 1). The beating sheet proved to be the best collection method for tingids. The tingids were collected on a *Lantana* plant, of the family Verbenaceae. The tingids like to stay on the back of the leaves and were knocked down into the beating sheet basket.

Figure 8: Tingidae

The family Nabidae (Figure 9) is a member of the superfamily Cimicoidea. Nabids are more commonly known as damsel bugs. Nabids are easily recognized by their small size, slightly enlarged front femora, and a figure of small cells lining the margin of the hemelytra membrane. Nabids feed on many different insects (Triplehorn and Johnson 2005). Fifteen nabids were collected at a vapor light, one at a black light, three by a sweep net, and two from a Malaise Trap (Table 1). Mercury vapor light was the obvious victor in collection method.

Figure 9: Nabidae

The families Pentatomidae, Scutelleridae, Rhyparochromidae, Lygaeidae, Heterogastridae, Pyrrhocoridae, and Coreidae are all members of the suborder Heteroptera and the infraorder

Pentatomomorpha. Members of the infraorder Pentatomomorpha are all terrestrial with prominent antennae and a trichobothria (mostly). The majority of the members of Pentatomomorpha are plant and sap feeders (Triplehorn and Johnson 2005).

The family Pentatomidae (Figure 10) is a member of the superfamily Pentatomoidea. Pentatomids are more commonly known as stink bugs. Pentatomids are easily recognized by their prominent five-segmented antennae and their round to oval shape. Many pentatomids are brightly colored and release a unpleasant smell. Most pentatomids are plant feeders; though one subfamily, Asopinae, is predaceous (Triplehorn and Johnson 2005). Eight pentatomids were collected at a mercury vapor light, one via a beating sheet, and one by hand (Table 1). According to this study, mercury vapor lights were the most productive for collecting the family Pentatomidae.

Figure 10: Pentatomidae

The family Scutelleridae (Figure 11) is also a member of the superfamily Pentatomoidea. Scutellerids are more commonly known as shield-backed bugs. Though members of the family Scutelleridae have a similar silhouette as Pentatomids, they are easily distinguished by their enlarged scutellum which expands to the tip of the abdomen (Triplehorn and Johnson 2005). Eight scutellerids were found at a mercury vapor light and one was collected by hand (Table 1). As shown by this study, the use of a mercury vapor is the most effective collection method for scutellerids on Dominica.

Figure 11: Scutelleridae

The family Rhyparochromidae (Figure 12) is a member of the superfamily Lygaeoidea. There is no common name known or used for the members of the family Rhyparochromidae. Rhyparochromids are usually dull colors and are easily recognized by their inflated and spiny fore femora, though not a defining characteristic. The truly defining characteristic for Rhyparochromidae is the upward curve of the abdominal suture between the fourth and fifth sterna. Rhyparochromids feed mostly on mature plant seeds (Triplehorn and Johnson 2005). One rhyparochromid was found at a mercury vapor light, one by a sweep net, one by a beating sheet, and one was collected by hand (Table 1). There is no clear optimal collection method here.

Figure 12: Ryparochromidae

The family Lygaeidae (Figure 13) is also a member of the superfamily Lygaeoidea. Members of the family Lygaeidae are more commonly known by the name seed bug. Lygaeids are easily recognized by all dorsal abdominal spiracles. Many lygaeids have aposematic coloring as they feed on noxious plant materials and are brightly colored. As implied by their common name, many species of the family Lygaeidae feed exclusively on seeds (Triplehorn and Johnson 2005). Nine lygaeids were collected at a mercury vapor light, making mercury vapor lights the best collection method (Table 1).

Figure 13: Lygaeidae

The family Heterogastridae (Figure 14) is the third member of the superfamily Lygaeoidea discussed here. No known or commonly used common name for the members of the family Heterogastridae. Heterogastrids are distinguished by the presence of all ventral abdominal spiracles and a large closed cell at the apex of the hemelytron. The are small insects that feed on urticaceous (irritating and poisonous) and similar plants (Triplehorn and Johnson 2005). Three heterogastrids were collected at a mercury vapor light, two by the use of a sweep net, six by the use of a beating sheet, and six were collected by hand (Table 1). Though beating sheet and hand collecting tied, I would endorse the use of a beating sheet over hand collecting as hand collection is truly just luck of the draw.

Figure 14: Heterogastridae

The family Pyrrhocoridae (Figure 15) are members of the superfamily Pyrrhocoridea. Members of the family Pyrrhocoridae are more commonly known by the name red bug and cotton strainers. Pyrrhocorids resemble lygaeids in that they long and oval. They are usually black with red patterns. They are distinguished physically by the absence of ocelli and the presence of numerous branched veins and cells in the membranous hemelytra. As implied by one of the common names, Pyrrhocorids are known for eating cotton and being pests thereof (Triplehorn and Johnson 2005).

Figure 15: Pyrrhocoridae

The last family member of the infraorder Pentatomomorpha being discussed is Coreidae (Figure 16). Coreids belong to the superfamily Coreoidea. The more common name for Coreidae is leaf-footed bug. Coreids are generally middle sized insects that are dark in color. They have a head more narrow than the pronotum. They have distinct stink glands and many species are known for giving off a strong odor. Many have an enlarged hind tibia that can seem leaf-like and help in disguise. Coreids are mostly plant feeders (Triplehorn and Johnson 2005). The single coreid was collected by hand off of the *Cymbopogon* (Lemongrass) plant.

Figure 16: Coreidae

The family Cicadidae (Figure 17) is a member of the suborder Auchenorrhyncha and the superfamily Cicadoidea. The common name for Cicadidae is cicada. Cicadas are easily recognized by their large size, three ocelli, and unique shape. Cicadids are unique in that they can produce a sound loud enough for the human ear to hear. Many cicadids have very interesting lifecycles in that they spend years (up to seventeen in some species) underground as larvae. They feed mostly on plant materials (Triplehorn and Johnson 2005). Thirteen cicadids were collected at a mercury vapor light (Table 1), making mercury vapor lights the most effective collection method for cicadids.

Figure 17: Cicadidae

The family Cercopidae (Figure 18) is a member of the suborder Auchenorrhyncha and the superfamily Cicadoidea. The more common name for members of the family Cercopidae is froghopper or spittlebug. Cercopids are easily recognized by a particular spination on the hind tibia and can resemble frogs, hence one of their common names being Froghopper. Though most are dull brown colored, there are some (as in this collection) that have unique color patterns. Cercopids feed mostly on plants. The immatures submerge themselves in spittle until maturation, hence the second common name being Spittlebug (Triplehorn and Johnson 2005). Three cercopids were collected at mercury vapor lights and one was collected by the use of a Malaise Trap (Table 1). mercury vapor lights were the best collection method for cercopids in this study.

Figure 18: Cercopidae

The family Membracidae (Figure 19) is a member of the suborder Auchenorrhyncha and the superfamily Cicadoidea. Members of the family Membracidae are more commonly known as treehoppers. Membracidae are easily distinguished from other members of the suborder Auchenorrhyncha by their enlarged and often uniquely designed pronotum. The pronotum extends back over the abdomen and can make the membracids appear humpbacked. Membracids feed strictly on trees and shrubs. They can be either gregarious or solitary (Triplehorn and Johnson 2005). Two membracids were collected by at a mercury vapor light (Table 1), making it the best way to collected membracids for this study.

Figure 19: Membracidae

The family Cicadellidae is a member of the suborder Auchenorrhyncha and the superfamily Cicadoidea. Members of the family Cicadellidae are more commonly known by the name leafhopper. Cicadellids are distinguished by "one or more rows of small spines extending the length of the hind tibia." They are usually very small, not exceeding 13 mm in length. Some are marked by beautiful color patterns. Cicadellids live and eat on most all kinds of plants (Triplehorn and Johnson 2005). Thirteen cicadellids were collected at a mercury vapor light, one at a black light, six via a sweep net, thirteen with a beating sheet, one hundred and forty two with a Malaise Trap, and seven were hand collected (Table 1). Malaise Traps were the best method for collecting cicadellids in this study.

Three noticeable subgroups of Cicadellids were collected and observed on Dominica. They are titled subgroups A, B, and C. Subgroup A (Figure 20) is distinguished by bright coloration with varying size. Subgroup B (Figure 21) is distinguished by their brown spotted coloration and

small size (not exceeding an approximate 3mm long). Subgroup C (Figure 22) is distinguished by uncharacteristically long antennae. Note that a great majority of cicadellids have short antennae, as short antennae are one key leading to the family Cicadellidae. The uncharacteristically long antennae found in subgroup C are approximately three times the length of the head. As seen in Table one, thirteen cicadellids in subgroup A were found at a mercury vapor light, one at a black light, six via a sweep net, thirteen with the use of a beating sheet, one with a Malaise Trap, and seven were hand collected. The vast majority of cicadellids in subgroups B and C were found with a Malaise Trap. This means that both mercury vapor lights and beating sheets are best for collecting cicadellids in subgroup A and Malaise Traps are best for collecting cicadellids in subgroups B and C.

Figure 20: Cicadellidae Subgroup A

Figure 21: Cicadellidae Subgroup B

Figure 22: Cicadellidae Subgroup C

The families Delphacidae, Cixiidae, Issidae, and Flatidae are all members of the suborder Auchenorrhyncha and of the superfamily Fulgoroidea. Members of the superfamily Fulgoroidea are most easily distinguished by only a couple spines on the hind tibia (as opposed to many), antennae located below the eyes, and a "sharp angle separating the side of the head and the front." Fulgoroids feed on an array of trees, shrubs, plants, and grasses (Triplehorn and Johnson 2005).

Members of the family Delphacidae (Figure 23) do not have a common name. Delphacids are recognized by a distinct spur at the apex of the hind tibia. They are small and range in colors. As they are plant feeders, they have been known to cause crop damage (Triplehorn and Johnson 2005). Table 1 shows that two delphacids were collected at a mercury vapor light sheet and one was hand collected, making the mercury vapor light the best collection method for delphacids in this project.

Figure 23: Delphacidae

Cixiidae (Figure 24) does not have a common name. Cixiids are easily recognized by hyaline wings with spots along the wing veins (Triplehorn and Johnson 2005). Four cixiids were collected at a mercury vapor light, one at a black light, and fifty two by the use of a Malaise Trap (Table 1). Malaise Traps were shown to be the best collection method for cixiids in this study.

Figure 24: Cixiidae

Members of the family Issidae (Figure 25) do not have a recognized or used common name either. Most issids are small, dark, short winged, and stocky (Triplehorn and Johnson 2005). Table 1 shows that one issid was found at a mercury vapor light, one via a sweep net, and fifteen by the use of a Malaise Trap; Malaise Trap was the best collection method for issids in this study.

Figure 25: Issidae

There is no common name listed for the family Flatidae (Figure 26) either. Flatids are easily recognized by their wings with numerous cross veins assuming a wedge shape over the body at rest. Flatids are known to feed mostly on leaves and vines in woody areas (Triplehorn and Johnson 2005). One flatid was collected at a mercury vapor light, one by a beating sheet, and one with a Malaise Trap (Table 1). This shows no clear victor in collection method for Flatids.

Figure 26: Flatidae

Psyllidae (Figure 27) is the last family to be discussed. Members of the family Psyllidae belong to the suborder Sternorrhyncha and the superfamily Psylloidea. Psyllids are more commonly known by the name jumping plantlice. Psyllids are easily recognized by their small size, the strong jumping legs (hence their common name), and long antennae. Psyllids feed mostly on plant juices and different species can be very host specific. Table 1 shows that seven psyllids were collected in a Malaise Trap, suggesting that Malaise Trapping is the best collection method for psyllids in this study.

Figure 27: Psyllidae

As stated previously and shown in Table 1, four hundred and sixty four specimens were collected throughout the duration of this thirteen day study. Figure 1 illustrates that the majority of the specimens collected belong to the family Cicadellidae, Subgroup B was the majority collected within the family. The second highest family collected was Cixiidae. The third family most collected was Veliidae.

Table 1 shows that three hundred and sixty four specimens were collected with the use of a Malaise Trap, making it the most productive collection method for this study. Figure 2 illustrates how mercury vapor lights were the second most productive, hand collection was third, and the use of a beating sheet was fourth. It is deduced that the best collection method for the order Hemiptera on the island of Dominica, West Indies is by the use of a Malaise Trap.

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