Survey of Orthoptera in Dominica, W.I.

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Dominica 2012 Study Abroad Program

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Absract

Orthoptera play an important role in the ecosystem and are widely distributed and commonly found. Orthoptera were collected on the island of Dominica and identified to see the different varieties found there. A total of 14 different specimens from the order Othroptera were found including 8 katydids, 4 crickets, 1 mole cricket and 1 grasshopper.

Introduction

Orthoptera is a common order of insects found on the island of Dominica. Within this order katydids, grasshoppers, mole crickets and crickets have been found on the island which are from the families, Tettigoniidae, Acrididae,Gryllotalpidae and Gryllidae , respectively. The families within the order Orthoptera are very diverse and commonly seen in many areas of the world. The most commonly encountered Othoptera on the island are Katydids. Orthoptera are mostly herbivorous and can be found near their source of food. Most Orthoptera have four wings, with the forewing usually sclerotized and known as tegmina. Although most species have wings there are some species that do not have wings or they are greatly reduced. Many Orthoptera have saltatorial legs which are used for jumping but there are entire families which do not have this type of modified limb, such as the mole crickets, Gryllotalpidae, whose forearms are tarsorial and are modified to assist it in digging. Most Orthoptera produce offspring annually and use sound production in locating a mate. The main predators on the island are birds, bats, lizards and spiders.

Grasshoppers are some of the least seen on the island. Grasshoppers are from the suborder Caelifera and the family Acrididae. Caelifera are jumping insects with enlarged femora, have three or fewer segments of the tarsi and often have short antennae. Individuals of this suborder are also distinguished by having their tympanum located on the first abdominal segment, and having a short ovipositor and cerci. Members of the family Acrididae are normally gray or brown and often have colored hind wings. They are often found on vegetation and can cause severe destruction to plants.

Individuals of this family often produce sound during the day unlike most Orthoptera, who call at night. Acrididae produce sound by creating friction between their inner hind femur and the edge of their front wing.

Crickets and katydids are part of the suborder Ensifera, and are characterized by their long antennae and in most cases prominent ovipositor. Mole crickets are also in the suborder Ensifera however, they are distinctly morphologically different than crickets and katydids and will be discussed later. The tympanum of crickets and katydids is located at the base of the fore tibia and is either fully exposed or have a slit like appearance. They also use their forewings to produce their songs.

Crickets resemble katydids and can be distinguished by their three segmented tarsi, while katydids have 4 tarsi. When they are calling at night, crickets can also be distinguished by their songs which are more musical and rhythmic. Also, while both ovipositors are large the cricket in most cases has a needle like ovipositor while the katydid often has a blade-like ovipositor. Crickets are often brown in color and can often be seen in vegetation and on paths.

Most can be seen out in the open during both day and night, but are most active during the night. Some species of Katydids exhibit type of camouflage to avoid predators. Katydids also have blade-like ovipositors and 4 tarsal segments and have a tympanum on their fore tibia. Only 11 species have ever been recorded on the island, half of which are endemic (Otte and Naskrecki 2004).

Mole crickets, Gryllotalpidae, are brownish in color and 20-35mm in length, with short antennae, four wings, forelegs modified for digging, tympanum on fore tibia and tarsi have three segments. They are often found in moist soil near ponds and streams and spend the majority of their lives underground. Mole crickets make burrows to obtain food, amplify sound and to lay eggs. Local farmers in Dominica often have problems with mole crickets as pests. Males are often heard giving a

constant call early in the night right after dusk. Females of this family do not have ovipositors (Capinera 2004).

Materials and methods

During a stay at the Archibold tropical research center Orthoptera specimens were caught between May23, 2012 and June 9, 2012. Many of the katydids and mole crickets used for the project were collected around the veranda and station and were often in plain view. The grasshoppers and crickets were not as simple to catch and were often found in grassy or wooded areas. The specimens used for this project were collected using hands, Ziploc bags, malaise traps and nets. Most Orthoptera were often caught by visually finding them or listening to their intricate calls. However, in one case a few Orthoptera were caught in aerial malaise traps. Pictures of the individuals were all photographed using either my personal camera which is a Nikon AW100 or a Nikon D300 camera with various Nikkor lenses and extension tubes. All of the individuals caught were measured from the tip of the head to the end of the wing when at rest over the abdomen. In cases of apterous or nymphs the measurement was from the tip of the head to the end of the abdomen. All katydids and crickets had antennae length measured. All specimens collected were pinned and all katydids and had their wings spread. All Orthoptera were identified down to subfamily using at least two of the three resources, Borror and Delong's introduction to the study of Insects, 7th edition, Capinera's Field Guide to Grasshoppers, Katydids, and Crickets of the United States, and www.discoverlife.org identification keys.

Results and Discussion

Tettigoniidae

The most common Orthoptera (figure 1 and 2) on the island are a large vibrant green katydid that have a white stripe from underneath their eye, most were female with long ovipositor which bend

sharply upward. Some other characteristics were the hind wing extends out farther than the forewing and the tympanum on the fore tibia is exposed. The lengths of the individuals caught were 85.5mm and 83.12mm long, the antennae from those katydids were 53.07mm and 50mm. This species is from the subfamily Phaneropterinea and is most likely from the genera microcentrum or stilpochlora.

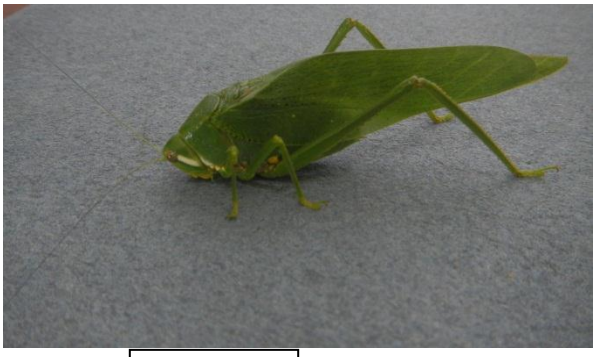

Figure 1

Figure 2

The second most common katydid we ran into on the island was a large brown katydid (Figure 3 and 4) commonly found on the station property. The subfamily for these individuals found is Pseudophyllinae. One of the individuals was caught on a plant, Tibouchina grandifloria and when held in captivity ate the leaves collected from it. The two females caught were 65.5mm in length and 69.84mm in length and had antennae lengths of 148mm and 132mm, respectively. The male found was 66.33mm in length and had 144.41mm antennae. This type of katydid's distinguishing features are that the fore wing are longer than hind wing, the tympanum slits on the fore tibia and the females have a falcate ovipositor.

Figure 3

Figure 4

Two medium sized green male katydids (Figure 5 and 6) which were dorsally red on the abdomen are from the subfamily Phaneropterinea and were found on the station's housing property. They had a body length of 42.9mm and 46.24mm and an antennae length of 37.95mm and 34.2mm, respectively. Characteristics of these specimens were the exposed tympanum on fore tibia, spine on fore coxa and the hind wings extended further than the forewings.

Figure 5

Figure 6

A small green male from the subfamily Phaneropterinae (Figure 7) measuring 42.3mm in length was found on the station housing. Antennae measured 33mm and hind wings are longer than

forewings. This individual also had and exposed tympanum on the foretibia. This specimen had small ant destruction during the curation process.

Figure 7

One small green female from the subfamily Phaneropterinea (Figure 8) was found on the station housing and measured 40.45mm. in length. The hind wing was longer than forewing, both were narrow. The antennae are 36.13mm and the ovipositor curved upward sharply.

Figure 8

A large dark brown male with a blue abdomen found on the station's veranda measuring 73.24mm in length with antennae 150+mm is from the subfamily Psuedophylinae (Figure 9 and 10) . The Female found in the same area had a straight long ovipositor and measured 75.5mm in length with

an antennae length of 116.7mm. Distinguishing characteristics of this species is hind wing and fore wing are the same lengths, the tympanal slits and the one spine on fore tibia. Also, a dark brown male with same camouflage coloring was found in Morne Trois Pitons National Park in a rest area close to Middleham falls. He has a length of 63.73mm with 137.8mm antennae and is believed to be the same species as the one found on the station property.

Figure 9

Figure 10

Small brown katydid (Figure 11) found on station property at the top of Mt. Joy with a length of 33.9mm and antennae of 137mm had wing pads present and a camouflage appearance. It is believed to be from the subfamily Psuedophylinae and may be a nymph of Figure BLAH but findings were inconclusive.

Figure 11

Two relatively minute sized female katydids(Figure 12 and 13) were found in the malaise trap from the subfamily Meconematinae measured 5.25mm to abdomen and 8.88mm from tip to wings. It I believed that the antennae were broken in the process and the antennae is at least as long as the body length. The ovipositors were curved sharply upward and the hind wings were significantly longer than the forewings.

Figure 12

Figure 13

Gryllidae

A male brown cricket (Figure 14 and 15) from the subfamily Gryllinae measuring 19mm in length with 64.7mm antennae was found by the station's bathing stream. The cricket had wings that reached mid abdomen. The species of the cricket is most likely *Gryllodes sigilatus, the* adult tropical house cricket (Capenera 2004). This species was found in great numbers on the island and most were immature during collecting.

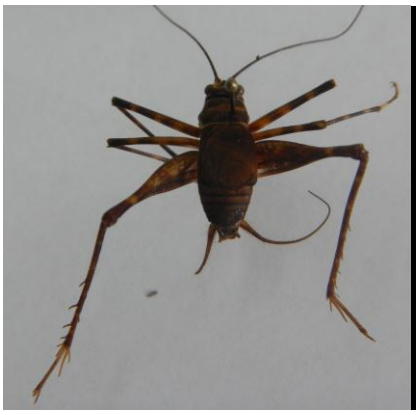

Figure 14

Figure 15

Female cricket (Figures 16 and 17) measuring 28.85mm in length is from the subfamily Eneopterinae. The antennae measured 49.5mm; the second tarsal segment expanded laterally and was flattened dorsoventrally. There were small teeth in between longer spines on hind femur. There were many others found throughout Springfield.

Figure 16

Figure 17

A brown apterous female cricket (Figure 18) from the subfamily Oecanthinae measured 24.5mm in length with an ovipositor measuring 21.33mm and antennae 116.5mm.

Figure 18

A brown male cricket (Figure 19) found in malaise trap from the subfamily Gryllinae measured 17.75mm in length with antennae 7.5mm long.

Figure 19

Acrididae

A small brown adult male grasshopper (Figure20) from the subfamily Acridinae measured 23.12mm long and was found in a malaise trap.

Figure 20

Gryllotalpidae

Two male Scapteriscus spp. (Figure 21 and 22) were found at night on the station's housing property. Mole cricket males could be distinguished by females in that the wing produces an area known as the harp used in sound production, which the females do not have. The mole crickets were discovered late in the research process to allow for proper curation and were kept alive and returned to their habitat. It had been previously recorded that Scapteriscus didactylus specimens have been confirmed on the island (Nickle and Castner (1984).

Figure 21

Figure 22

While on the trail of Mt. Joy a medium sized apterous moss camouflage katydid was caught with antennae over twice its body length. Capture and curation left the specimen brittle and fragmented and did not allow for proper identification and photography. Also, a few cricket specimens were lost due to ant infestation and were not properly identified before destruction. It was believed to be similar to the Eneopterinae found but can't be confirmed. A total of 14 different specimens from the order Othroptera were found in Dominica including 8 katydids, 4 crickets, 1 mole cricket and 1 grasshopper. Voucher specimens of all species of Orthoptera collected were deposited in the insect collection at Texas A&M University.

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