

# **Cabrits Beetle Display**

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## **Introduction**

There are several families of beetles who make their homes in the primary and transitional forest around the Springfield Guest House located in Springfield, Dominica. This unique environment provided me an opportunity to collect and identify several beetle specimens unavailable anywhere but in the rainforest. Cabrits National Park, located on the Northwest corner of the island, has long been interested in creating a relationship with the Texas A&M University Dominica Study Abroad Program which would promote healthy communication and information sharing. In an attempt to take the first steps towards a stronger relationship, the decision was made to create displays for the National Park's Visitor Center. My project centered around creating a display of beetles to be donated to the Forestry Administration on Dominica. This report is a descriptive How-To synopsis outlining the methods and processes used for collecting the beetle specimens used for the display. Also included are suggestions for future collectors and a list of the families I collected.

## **Methods**

The process of finding, collecting, preserving, pinning, identifying, and organizing a display of beetle specimens is complicated and time-consuming. It is not an exact science, however certain procedures can be implemented to provide more efficiency and effectiveness while collecting. Care should be taken during each step of the process to ensure ample and favorable results.

*Finding* - The vast majority of beetles I collected were found on and about the Springfield Plantation and grounds. However, I did collect 5 specimens from malaise traps in Cabrits National Park dry forest, and another 6 from malaise traps deployed in the Middleham Falls National Forest. I walked several trails around the Springfield grounds to find beetles, including but not limited to the Check Hall River Trail, the L'etang Trail, The Fifi / December Trail on Mount Joy running out of the Bee House. In addition to these trails, I also explored the Check Hall River ½ mile east and west of the trail intercept in an attempt to locate more beetles. Habitats from which beetles were collected:

- Primary Forest (Springfield Guest House)
- Transitional Forest (Springfield Estate)

- Tropical Rainforest (Middleham National Forest)
- Dry Forest (Cabrits National Forest / Northwest Dominica)

*Collecting* – There were several techniques employed in an attempt to collect a wide range and number of beetle specimens. These included but were not limited to forest walks, light and dung traps, aerial and ground malaise traps, outside project donations, and happenstance sightings. My forest walks, which usually lasted anywhere from approximately 2.5 to 4 hours, provided good opportunities to find wood-boring and tree-dwelling beetles. Trips on the broad mountainside forests of Mount Joy, up the Checkhall River, and along the L’etang Trail to the Northwest of the Field Station were frequent and yielded me some of my best finds. I would usually leave between the hours of 1:00 PM and 3:00 PM and stay out for 3-4 hours. I also walked two perimeter transects about and around the Springfield Guest House in the early morning hours of 5:00 and 6:00 AM. Although I had heard from many Springfield residents that this was the best time to see many of the larger beetles of the island, both walks yielded me minimal additions to my collection. None of the extremely large “Herculean Beetles” I sought were even sighted. During the walks I would turn over and/or break open dead trees and logs, as well as any other organic matter scattered about the forest floor. My findings indicate that wood-boring beetles tend to be found more often in dead wood that has been decaying for only a short amount of time, rather than wood which has been thoroughly broken down physically by the forces of nature. I used a machete, or cutlass, on several occasions to chop decaying logs into fragments of an appropriate size to search through. However, during the last handful of collecting hikes I opted to use a hacksaw-like device, or “chipping hammer” to break apart logs. This would allow me to break open logs effectively and efficiently at close range. Beetles tended to be found more often in either the area between the bark of a dead log and the log itself, underneath the dead log completely, or inside burrows within the core of the dead log. I would also overturn rocks both large and small and sift through the packed soil underneath for beetles. Beetles found in these environments usually had created their own space or inhabited old earthworm tunnels or terrestrial crab niches and used the rock as shelter during the hot days. While it was important to focus on dead logs and overturned rocks for beetles, it was always a benefit to snoop around an area with plentiful flowers or tree bloomings. Beetles are often times

attracted to the sweet scents or bright colors of these plants. Also, a quick look through a knot in a tree or a pile of compost always yielded the opportunity to find a good specimen.

By and large, the amount of beetles I collected on these walks was frustratingly small however, and the majority of my specimens came from light traps placed in and around the Springfield Guest House. I used two light traps to attract beetles, one with fluorescent lighting, and the other with a mercury vapor light bulb. Early on into my stay at Springfield, I noticed that the fluorescent lighting fixtures at the Springfield Stream House and Guest House regularly attracted various beetles. I realized the opportunities afforded to me by these lights and henceforth checked them most evenings and periodically throughout the night for specimens I considered to be valuable additions to my display. Most of the time, the beetles would fly into the sheltered areas of the houses towards the light and attach themselves to some part of the fixture or possibly an area around the light. Over time they would more than likely exhaust themselves by flying into the light repeatedly between periods of rest. After 30 to 45 minutes most beetles fly away out of confusion or perhaps frustration. This made frequent checks of the lighted environments imperative to the success of the findings. The other light trap used was a mercury light bulb placed 12-20 inches from a large white sheet, hanging in midair. This apparatus was set up in an area where the light could be exposed to a broad hillside or similar environment so as to attract as many beetles as possible. The beetles would be attracted to the intense light and in turn fly into the large white sheet nearby. Affixed to the sheet, the beetles would remain stable and viewable a comfortable distance from the light and still satisfy their instinctual urge to matriculate towards it. The ease of collecting beetles from the sheet proved to be the biggest asset of using the mercury vapor light system. Since many beetles instinctually fall when alarmed, just placing an open kill jar directly underneath most beetles caused them to drop directly into it.

In addition to light traps, five "homemade" dung traps were created and deployed on the Springfield premises. Four malaise traps, two aerial and two ground, were also set up at the same location. Since beetles tend to fly around areas of dense foliage and not through them, these traps were set up in a clearing near an area with a high concentration of trees and plant life. The dung traps I fashioned were simple and efficient. A small bowl with antifreeze was placed in soft soil level with the terrain. A small film canister with pig fecal matter was placed in the center of the antifreeze pool. And secured with tape. Another small bowl of similar size and shape was placed upside-down on top of the other bowl and fastened with tape.

Three holes in the top bowl provided ventilation for the scent of the feces to escape and attract beetles. In addition, these holes served as entrances for interested beetles to enter the death trap. Upon entering, beetles would fall into the antifreeze and absorb the toxic chemicals into their bodies. Unfortunately, as successful as dung traps are in some environments, they yielded me no specimens for my collection. The malaise traps work on a similar principle. The lower half of a malaise trap is dark and the upper portion is white. As beetles fly into the dark mesh hanging down, they instinctually fly upwards towards the lighter area, and into a bottle of alcohol where they die. All malaise trap findings used were courtesy of the Beetle Diversity Group, since all available malaise traps were being used towards their project. Luckily, despite the outcome of the dung traps, the malaise traps yielded me several important contributions to my collection.

Several beetles were donated to my collection from other students researching other interesting aspects of the rainforest. Often times students would catch beetles in their own traps or during their personal research, and in turn donate them to me. As previously mentioned, the malaise traps set up all over the island were for various other experiments. Fortunately, their findings were available to me in their entirety for use in my project. The only unmentioned method for collecting beetles is perhaps the most obvious: happenstance sightings. Several beetles that eventually made it into my collection were found outright by fellow students of myself. These findings are important although they cannot be relied upon exclusively due to the private and non-confrontational nature of beetles.

*Preserving and Pinning* - To preserve my beetle specimens in the time between their death in either malaise traps or killing jars, I kept them in 95% alcohol solution. When a convenient time arose to pin and place my specimens, they would be removed from the solution and dried for 5-10 minutes. Once removed from solution containers, it is important to not place specimens directly onto Styrofoam pinning boards, but rather onto a wooden or metal surface. Styrofoam breaks down when exposed to certain lab chemicals and could potentially ruin beetle specimens. Beetles should be pinned using #2 stainless steel pins, although #3 stainless steel pins may be appropriate for larger specimens. As one looks at a beetle from behind, the pin should be driven cleanly and carefully through the right elytra, or wing, of the beetle. When the pin exits the underside of the beetle note the angle created between the pin and the beetle. If properly pinned, it should be a 90° angle from both the side and frontal view. This will ensure that your beetle is properly

pinned and can be viewed properly once placed inside the case. Properly pinned beetles should be housed firmly in a Schmidt box or similar container until they are ready to be added to the display case. This will prevent any potential harm to the beetle from scavenger insects or elements of nature.

*Identifying and Organizing* - To identify which beetles were from which families, I employed the expertise of one Dr. James Woolley, known best for his parasitic wasp work done at Texas A&M University. Dr. Woolley was able to effortlessly identify all families in my collection either by sight, or upon closer inspection with a microscope. However, if an expert of such merit and caliber is unavailable, I would recommend the Richard E. White's *Peterson Field Guide to Beetles*. Once identified, beetle specimens were organized in my display case by family. However, many other methods can be used to display a collection of beetles (i.e. by size, scale, or feature), separating the beetles by family was merely a matter of personal taste. 11 families of beetles were collected for my display, they are as follows:

- Brentidae
- Calliriphidae
- Cantharidae
- Cerambycidae
- Chrysomelidae
- Curculionidae
- Elateridae
- Lampyridae
- Meloidae
- Passalidae
- Scarabaeidae

#### **Materials Used**

- Glass kill jars (2-inch diameter and 4-inch diameter)
- 95% Alcohol Solution
- #2 and #3 stainless steel pinning needles
- Machete or Cutlass
- Chipping Hammer
- Display Case
- Storage boxes
- Malaise Traps (ground and aerial)

#### **Suggestions For Future Collectors**

1. Always have a kill jar on your person, because you never know when you will see a great addition to your collection.
2. Use light traps as often as possible, and place them in different areas until you find one which yields the most specimens, and hence, the best results.

3. Many beetles come out at night when conditions are wet, however the mercury vapor light is a potential electrical hazard when exposed to water. Investigate other lights which provide sufficient exposure and coverage without these added risks.
4. Read up on professional beetle collecting techniques before you come to Dominica, and plan on implementing at least one new method.
5. If you have little or no experience in entomology, employ the expertise of someone who does while preserving, pinning, and identifying the beetle specimens.
6. If dung traps are used, use dull colors and strong adhesives to provide maximum attraction and structural integrity.
7. Never leave dead beetles, pinned or otherwise, out in the open (i.e. on a tabletop, counter, shelf), always secure them in a box impermeable to ants.