Bethany Hoschar
Class of 2020
Forensic Science

Necrophagic Entomological Guilds on Two Climactically Disparate Atlantic Islands

R Christopher O'Brien, PhD
Forensic Science Department
Center for Wildlife Forensic Research

The majority of taphonomic research is conducted inland, so small island taphonomy research is crucial to understanding what occurs after death in or near large bodies of water. The goal of this project was to learn more about the entomological communities present in small island environments. This project was designed to identify the species of blowflies common, as would be seen in forensic casework, in the different environments, as well as observe maggots present on carrion over the experimental period. Three different environments were analyzed during the course of this project: Horse Island in the Long Island Sound, and Richard's Marsh in Connecticut owned by Yale Peabody Museum, and Curaçao.

To identify the species of blowflies, adult flies needed to be collected. Three different methodologies were used to collect adult blowflies. In Curaçao, fly paper was set up near the human analog. On Horse Island, a hanging fly trap was used in the area of the experimental set up. In the Marsh, live maggots were collected and reared to adulthood. The species of fly was determined by using one of two dichotomous keys, written by Whitworth in 2006 (North American blowflies) and in 2010 (West Indian blowflies).

To observe the maggots present on carrion, maggots were collected and preserved in alcohol from the experiments set up in Curaçao and on Horse Island. They were then counted and measured, and instar was determined.

In Curaçao, the most common species identified was *Chrysomya ruficacies*, also known as the hairy maggot fly. The maggots collected on the human analog did not fit this description, suggesting this species did not lay on the pig neck. On Horse Island, the most common species identified was *Lucilia s.p.*, while all of the flies collected from Richard's Marsh were identified as *Phormia regina*. When comparing the length of maggots between Curaçao and Horse Island, the average length of the maggots in Curaçao was greater in instar 2 and 3. Factors that could create the difference in length of maggots between the two islands include the species of blowfly, as well as environmental conditions, such as temperature, humidity, sunlight.

A major limitation from this project was caused by the method of collection of adult flies. The method of collection on Horse Island was the most efficient, collecting the highest quantity and providing the least damage to the fly. The fly paper used in Curaçao damaged the fly and removed the ability to pin the fly for identification. More research would need to be conducted to standardize collection methods, increase the amount of replicates, and to determine the cause of the difference in maggot length.

Citations

- Whitworth, Terry (2006). Keys to the genera and species of blow flies (Diptera: Calliphoridae) of America north of Mexico. *Proceedings of the Entomological Society of Washington* 108:689-725
- Whitworth, Terry (2010). Keys to the genera and species of blow flies (Diptera: Calliphoridae) of the West Indies and description of a new species of Lucilia Robineau-Desvoidy. *Zootaxa*. Magnolia Press.