

THE DEATH'S-HEAD
HAWK MOTH

BY CARLY NYIRI



Figure A: Top view of the *acherontia atropos*.

HISTORY

If you are familiar with the film *Silence of the Lambs*, then you know the dark symbolism that comes with the Death's Head Hawk Moth. These guys are real, and they actually belong to three different moth species: *Acherontia Atropos*, *Acherontia Styx*, and the *Acherontia Lachesis*. Each of these species contain the well recognized skull-shaped pattern on their thorax.

Death's Head moths are considered the fastest species of moth in the world, reaching a top flight speed of 30 miles per hour. With their impressive speed comes an impressive overall size. As adults these moths can reach a wingspan of over 5 inches, which is large for a moth. Their forewings are dark brown, with patterns of lighter brown and orange tones. Their hindwings are a golden-yellow tone with brown striped patterns.

BEHAVIOR

One of the most ominous features of the Death's Head Hawk Moth (aside from its appearance) is its ability to squeak. Most insects will rub together external parts of their body to produce a sound, but these moths produce their sound internally.

So how do these moths produce a squeak? The moth will first inhale air which will cause the epipharynx, a flap located between the throat and the mouth, to vibrate rapidly. The air is then released when the flap opens, resulting in a squeal-like sound. This process happens quick as it only takes a fifth of a second to happen. Most scientists will compare this process to the way an accordion works, by inflating and deflating air to produce sound.



Figure B: The images above and to the right are two different close up views of the skull marking that is located on the thorax.

MOTH VS BEE

Death's Head Hawk Moths primarily eat honey, and not nectar like most other moths. In order to obtain the honey, the fearless Hawk Moth will not hesitate to raid an active bee hive.

These moths have the ability to produce chemicals that mimic that of what bees produce, which allows for the bees to remain calm and not see the Hawk Moth as a threat to the hive. They also will produce a squeak that sounds like that of a Queen Bee, which causes the working bees to calm down and even in some cases halt their actions so the Hawk Moth can safely make their way through the hive to feed on the honey.





Figure C: Close up of the forewing and hindwing.

SYMBOLISM

The Death's Head Hawk Moth has a history of bad representation. Dating back to Greek mythology, *atropos* comes from a myth about the Fates, one of them being named Atropos. Atropos was responsible for death, cutting the thread that would end the life of a mortal. The genus of this species, *Acherontia*, is derived from the word "Acheron," which is a river located in Greece and known in mythology as the "river of pain."

A more recognizable symbol to most people for this moth comes from the famous movie "The Silence of the Lambs." In the

movie, the serial killer Buffalo Bill would stuff these moths into the throats of his victims. The reasoning behind this may be due to symbolically representing the screams or mocking the screams of the victims, since these moths to produce a piercing squeak themselves.

The Death's Head Hawk Moth has found its way into pop culture in many occasions due to their fascinating association with death and the supernatural. Some people even to this day believe that if one of these moths enters their household, misfortune and even death is near.

IMAGING TECHNIQUES

My approach for photographing this subject included the following materials: a Nikon D850, 50mm NIKKOR lens, 105mm Micro NIKKOR lens, white plexiglass, copy stand, and two LED lights.

The camera was mounted to the copy stand with the lens facing down on the subject. I utilized two lighting techniques for my images: two LEDs facing the subject at a 45 degree angle and two LEDs parallel to the subject. The parallel lighting technique was used in order to show detail in the wings, whereas the angled lighting worked best for even subject lighting for the rest of the subject.

All of the images in this article are a composite image made of multiple images using focus stacking. Focus stacking involves taking a series of photos, each with a different area of focus. This can be



Figure D: This bottom view image of the head of the hawk moth was focus stacked using a bit depth and opacity map in a stacking software.

done manually by adjusting the focus of the lens or with a focus rail (I chose to manually focus with my lens). The images are then stacked together in a software (I used Helicon Focus 7) to create a single, sharply focused image. I stacked my images using a bit depth and opacity map to determine the areas of focus (see figure E below for a visual of this technique). This technique is especially helpful in macro photography when you are limited by the available depth of field.

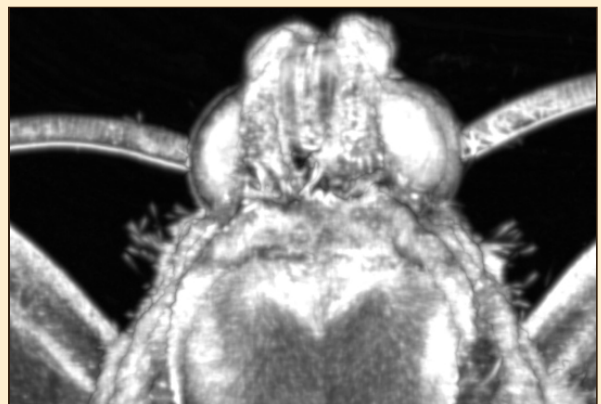
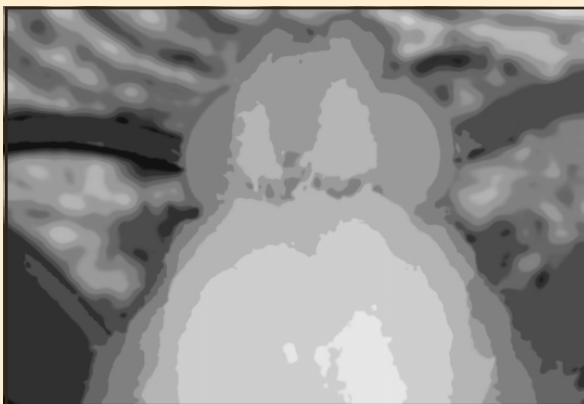


Figure E: This series of images shows the process of focus stacking using a depth map in the Helicon Focus 7 Software (from left to right): The resulting depth map image and the opacity map image.

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My current interests in the field are working with optical systems with current plans to build my own Schlieren Optical System. I am also interested in learning more about the development and applications of optical imaging systems in the automotive industry.

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Figure F: Side view of the head.