COLLECTING SPHINGIDÆ WITH A MERCURY VAPOR LAMP

by Richard W. Holzman

During the summer of 1959 a mercury vapor lamp was placed against a building near Columbiaville, Michigan, to note the effects of the light on Sphingidæ. The studies led to the design of a suitable light trap.

It was found that when a Sphinx sees the light it will approach it at a slow rate, flying close to the earth, sometimes with occasional stopping on the ground but still maintaining a rapid beat of the wings. The moth will approach until it comes very close to the light, stopping from one to four feet away. At a few hundred feet from the trap, observing the flight of the Sphingidæ approaching the light, it was seen that the moth never makes a spiral flight as thought by some collectors, but rather a seeming "bee-line." After the Sphinx was near to the light it would settle. When it had finally come to rest and had remained for about 15 minutes, it would appear to be in a rather drowsy condition. The lamp used is capable of 10,000 lumens; this means that at one foot the light is about equal to the intensity of the sun. It then follows that the moth would take this light to be the sun's and "sleep". Some of the moths that had been attracted to the light were released a number of feet away to see if they would return; most of them did return, showing that once the moth had seen the light it would just be a matter of time before it would land near it.

Since the use of the intense light source solved the problem of attracting the moths, the next step in preparing the trap was to find a way to group the attracted moths in a small space. It was decided that the simplest way to do this would be to let them fly into a small open box, the light being at the top of the opening. This box was 2′ × 2′ × 2′ and made out of one inch wood sticks forming a skeleton. After the wooden skeleton had been made, a round piece of sheet metal, 3 feet in diameter, was placed on top of the wooden framework. From the center of this piece of metal a circle, 2′ in diameter, was cut out. This hole was to be the entrance for the moths. The lamp was then mounted using a mogul base attached to a square piece of wood placed perpendicular to the center of the base of the box. The center of the lamp was 8″ from the top of the box. After the lamp and doughnut-shaped metal disc were mounted, a solid piece of sheet metal, 3′ in diameter, was mounted 16″ from the top of the box. This final stage has 3 purposes: first, to protect the lamp against rain, as it becomes very hot and he

cold water could very easily crack the glass; secondly, to protect any moths against the rain so that they would stay in the trap and not fly off; and, finally, to use the bright surface as a mirror, directing intense light to all corners of the trap. Cloth 2′ × 2′ was tacked by its corners to the open trap. The purpose of the cloth was to form the sides of the box and also to give something for the moths to land on. Other materials such as screening or wood could have been used, but cloth is easiest to store when the trap is being moved.

The light that was used for the trap was a G. E. H 250-A5 mercury vapor lamp. To operate this lamp 240 volts at about 2 amps was needed. The power for the lamp was carried by 550′ of government surplus telephone cable. Although not the best, it was inexpensive and did not result in too great a voltage drop.

This trap, obviously, was by no means portable, the way some collectors like their units to be. The trap was very bulky, and the huge roll of cable was difficult to roll up after the summer's use. Also, all the electrical equipment, when mounted in one box, weighed about 80 pounds. So it can be seen that the trap would need modification for those who do spot collecting. Since the trap was at one location all summer, moving was not a prime consideration.

The trap was operated near a small forest, 1000 by 200 yards, 2 miles north of Columbiaville, in Lapeer County, Michigan.

The lamp was operated from about 9:30 in the evening till about 7:00 the next morning. The greatest noted occurance of Sphingidæ was from one to one-and-a-half hours after dusk. Though the light was allowed to run all night, very few moths were found in the morning (about 25 for the entire summer, the total catch being 288). This low number has partially been credited to the birds, as the remains of wings were sometimes found at the trap, the number depending on the results earlier in the evening. During the summer of 1959 the number found in the morning was about 40, and the total catch for 1959 was 190. No explanation has been found for this difference. It was thought that all moths attracted would fly or crawl inside the box. This did not happen; only about 50% were found there. The remaining ones were found very near to the trap.

During the entire summer of 1960 a complete record of the results was kept. It included the species and number of each caught that night and the weather for each day and night. For the period from June 25 to August 27, 1960, 288 Sphingidæ were taken, compared with 190 for 1959.

The following is a list of Sphingidæ and total of each species for the years of 1959 and 1960.

	1959	1960
Pholus pandorus	3	2
Phlegethontius quinquemaculatus	13	7
Ceratomia amyntor	8	8
undulosa	12	12
Sphinx chersis	5	4
gordius	6	2
drupiferarum	—	2
luscitiosa	—	1
eremitus	—	4
kalmiæ	1	—
Lapara bombycoides	14	13
Smerinthus jamaicensis	17	32
cerisyi	—	7
Paonias excæcata	56	85
myops	29	45
Cressonia juglandis	4	25
Pachysphinx modesta	8	7
Darapsa versicolor	3	4
myron	8	21
pholus	1	3
Celerio lineata	1	3

Careful examination of this table will yield many interesting facts. The only moths that were less common during 1960 than 1959 were *P. quinquemaculatus* and *S. gordius*. The other 4 decreases were only by one specimen. Moths that were much commoner in 1960 than 1959 were *S. jamaicensis*, *P. excæcata*, *P. myops*, *C. juglandis*, and *D. myron*. It should be noted that these increases are rather large. One *S. kalmiæ* was found in 1959 but none during 1960. Moths found in 1960 but not in 1959 were *S. drupiferarum*, *S. luscitiosa*, *S. eremitus*, and *S. cerisyi*. This discussion was not meant to conflict with itself but to show the advantage of using a trap rather than a bare lamp.

Among the other things caught were: 28 Saturniidæ, 40 *Catocala*, with some 300 Arctiidæ and 200 Noctuidæ. Thousands of other moths were observed as well as many beetles, wasps, and flies and an occasional swarm of small flying insects. Bats were also found along with a few toads and frogs who came to feast on the multitude of small insects.

The time of collecting and weather have a great deal to do with collecting. Note the following:

PERIOD	CATCH PER DAY							TOTAL	AVG. WEATHER
June 25-July 1	8	6	21	8	6	2	3	54	warm
July 2-8	4	0	2	—	4	2	2	14	cool
July 9-15	11	10	22	28	—	—	7	78	warm to hot
July 16-22	2	9	9	10	—	0	11	41	warm
July 23-29	7	5	7	4	6	13	5	47	warm
July 30-Aug. 5	4	6	4	7	2	2	0	25	cool
Aug. 6-12	7	0	0	—	0	1	—	8	cold
Aug. 13-19	4	2	1	2	4	1	1	15	warm to cold
Aug. 20-26	3	1	2	0	0	0	0	6	cold

The dash — indicates that the lamp was not operated, due to rain or various other reasons. The best nights for collecting were those following a warm, muggy, and cloudy day. The worst results were when sunny days were followed by clear cold nights. The best season for collecting was during July, the peak day being on July 12 (peak for 1959 was on July 4).

It is my opinion, therefore, that the trap described is the best method for the capture of Sphingidæ and most other moths. It is possible that other methods have resulted in a better *total* catch. However, it should be remembered that the locale was mostly northern farm land, not as rich in moths as in many of the southern regions.

It should be noted that this paper brings forth no scientific theory. The entire project was formed from the knowledge that during the night moths are attraced to light. In the future I hope to use my collecting techniques to make a study of why this happens.

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