

PREDATION ON CATOCALA MOTHS (NOCTUIDAE)

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ABSTRACT. *Catocala* adults are preyed upon by flying squirrels; tree and fence lizards; bats and birds, commonly in man-made situations.

I was born in the last century, in a family with natural history interests on the Ozark Mountain uplift in southwest Missouri. My first interest was ornithology/oology, then collecting insect and plant materials for sale, exchange and my collections. From the back porch I could look across a small field at the edge of 320 acres of "wild land," never cut, never fenced. The upland tree community was largely post, black and blackjack oak; the hollows had hickory, white and red oak with other trees especially along streams. The woods were commonly burned each spring, it was said, to kill the ticks, snakes and to rejuvenate the grass. The burning resulted in many of the trees having basal fire scars. On poor soil with a deficiency of rain, the timber was small, open and more widely spaced with limited underbrush. This presented an ideal situation in which to observe animal and insect life. Oats were sown in March and, like winter wheat, cut and shocked in June. Then, there was much time for me to be afield on my interests, in near continuously warm sunny days. That was *Catocala* country every year. Without electricity, light and baits yielded few specimens, and so, daylight collecting was carried on.

I have over 200 predator-injured *Catocala*, including every one of the larger eastern species. Injuries to their wings are various. I think Dr. T. Sargent did a good job of illustrating in his book "Legion of Night, The Underwing Moths" a theoretical injury which could be produced by the attack of a bird. But, in all of my injured *Catocala*, there is not one injury I think was produced by a bird peck. I once saw a flycatcher fly near a fluttering *Catocala* while popping its beak, probably because the bird's nest was near. The *Catocala* I have found resting on trees in depressions in the bark on oak trees draw their wings down tight, and I have said that a bird would need a vanadium steel lower mandible to bite a piece out of the wing or wings on one side. In the big woods of northwest Maine I once saw a scarlet tanager up in the top of a tall white birch, and the wings of a *Catocala* fluttered down. The tanager may have devoured the moth. A. J. Snyder says that he saw a *Catocala* "snapped" out of a tree by a scarlet tanager and immediately torn to pieces. Of utmost importance, fully 70% of all specimens of some lots injured have similar injuries in all four wings

or in the two hindwings, most of these obviously made at the same moment by the predator. These types of injury were not made by birds, even to flying moths.

Flying squirrels, genus *Glaucomys*, seem ideally fitted to attack *Catocala* as they live in the same situations. They are the most active voracious predators I know. One year I prepared a stupifying bait, fed through wicks, with a screen wire basket below to catch the moths which fell. All I could get were wings, and all I found accountable were flying squirrels, which I knew to be strongly insectivorous. I took jump-steel traps, attached noctuid moths to the pan and hung them on the tree trunks above the bait outlet. In these traps I caught flying squirrels, one after another, until I gave up that collecting method. They are widespread along with *Catocala*, where old trees remain in some numbers. The above mentioned injuries to the *Catocala* spp. are common.

In the Ozarks I have watched skinks or tree lizards flushing out the moths up on the limby portion of tree trunks, where *Catocala* tend to rest in the morning and on overcast days. Wings were found on the ground in such areas. These lizards are well fitted to attack moths and produce in an instant the torn pairs of wings which are so prevalent where the lizards live. Florida collectors have spoken of these. A considerable number of moths which Dean Berry sent me from Florida had over 40% with serious injury to their wings.

Conditions are different in other parts of the country. John W. Johnson of Corona del Mar, California, a shrewd experienced worker, writes: "... in fifty years of field collecting *Catocala* I have seen little evidence of predation. I have never witnessed an attack by birds on a flying *Catocala*, nor observed them searching tree boles for the moths. Nor have I ever collected moths showing the types of wing damage figured in Sargent's "Legion of Night" that has been ascribed to birds. An experienced observer in the 1920's and 1930's, Janet Riddell, saw a lizard, *Sceloporus* sp. hunting over a tree hole, encountering a *Catocala* at rest which it seized by the body, bit off the wings close to the body and swallowed the body whole. I have frequently observed *Sceloporus* sp. lizards climbing about tree boles as high as 15-20 feet above the ground, and have found sets of *Catocala* wings clipped off close to the body at the base of trees in groves where *Catocalas* were present and resting, which I supposed due to lizard predation." He has repeatedly mentioned the fact that the smaller western *Catocala* regularly fly from one thick clumped scrub oak to another two feet or less above ground, thus avoiding most predators. He collected a *Catocala californiensis* Brower with a spine of a low cactus driven 4 mm into its thorax.

Dave Baggett has kindly forwarded an extensive account of numerous experiences with predation on *Catocala* in Florida. His experiences usually include man's changes and their effects on both predatory life and *Catocala*, which differ greatly from my experiences while in my teens and twenties in the Ozark mountain area. He says: "... while eating lunch several *C. ilia* Cramer wings filtered down from the tree tops near me, and another specimen from which the abdomen had been chewed off, but the wings and thorax were still intact—the moth still quivering. The birds eating them were blue jays, but we never saw one of these birds catch one." He says that in Jacksonville his bait trap area was a regular feeding area for mockingbirds, English sparrows and blue jays. As his traps were emptied of insects early each morning, the birds would rapidly snap up the majority of the moths as they flew away. The birds preferred smaller moths as a rule; preferring *Catocala amica* Hübner and *micronympha* Gueneé over *ultronia* Hübner, *ilia*, *muliercula* Gueneé, etc., all common species. He says he has seen many wild specimens with bird beak patterns. He suspects the heaviest predation is by lizards, especially anoles and fence swifts. Even though they are relatively small, they will readily grab at large *Catocala* like *ilia*, *lacrymosa* Gueneé, *agrippina* Strecker, etc., frequently getting completely yanked off the tree trunk by the frantic flapping of the moth to get away, and most of the larger ones probably do. One rarely finds the smaller species with the rounded "lizard-type" bites on the wings. He has repeatedly seen American anoles capture and eat *Catocala* moths, including species as large as *ultronia*; and the anoles try to catch larger species, frequently leaving their marks. While trying to collect *C. jair* Strecker, an eastern fence swift on an oak was observed catching and eating one of these moths which, when flushed out, had settled near the lizard. Flying squirrels in Florida most definitely catch and eat *Catocala* and sometimes also gray squirrels. Some who have used bait traps or have baited trees will confirm this. Dave Baggett says on numerous occasions while watching lighted sheets he has seen bats and owls capture larger moths and *Catocala* spp., also at city lights, always catching the moths in mid-air. He has seen red-shouldered hawks catch the larger saturniid moths. He thinks birds do not aggressively seek out *Catocala* selectively. Certainly, that is not the case in Florida. Presumably, the greater number of mangled *Catocala* in collections have been attacked by lizards and not by the more powerful flying squirrels which can destroy a much larger number of the insects. At Ithaca, New York, skunks visited both the Cornell light trap and baited *Crataegus* shrubs.

Flying squirrels and tree and fence lizards are the important predators on *Catocala*. Moths at light and coming to bait attract skunks and

other animals. Bats are important predators around man-lighted areas. Instances of bird predation are reported for blue jays, scarlet tanagers and man-flushed *Catocala* by wood pewee. Many common species of birds are attracted to the insects which are flushed from light, bait and artificial traps. Birds sieze numerous small insects when traps are cleared releasing the insects, attracted as to bird feeders. Hornets and wasps also take part.

LITERATURE CITED

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