

EMERGENCE OF *HYALOPHORA CECROPIA* (SATURNIIDAE)  
BLOCKED BY SEEDS IN THE COCOON VALVE

G. P. WALDBAUER AND J. G. STERNBURG

Department of Entomology, University of Illinois, Urbana, Illinois 61801

In the fall of 1974 we collected in Champaign, Illinois, a cocoon of *Hyalophora cecropia* (L.) that, unknown to us, had the exit valve blocked by three unshelled sunflower seeds and half of a peanut kernel which had presumably been inserted there by a bird. At that time the cocoon was heavy and, when shaken, felt as if it contained a living pupa. It was chilled to break diapause and then placed in an incubator at 25°C with other cocoons. When it became obvious that nothing would emerge from this cocoon, we cut it open and discovered the seeds and a dead adult female that apparently had been unable to push through the blocked valve. We have found many cocoons with foreign objects, usually seeds, forced into the exit valve, but this is the first time we have seen direct evidence that this can result in mortality.

Reports of seeds within the valves of *cecropia* cocoons are scattered throughout the literature. For example, Minot (1870) found beech nuts, and LeBaron (1870) and anonymous (1870) found corn kernels. Waldbauer & Sternburg (1967) found a variety of seeds and an earthworm.

Every fall and winter since 1965, we have found foreign objects in *cecropia* cocoons collected in or near Champaign and Urbana, Illinois, but we recorded data only during the first three years. The number and percentage of cocoons with foreign objects found each year are: 1965-66, 15 (3.1%); 1966-67, 7 (3.5%); and 1967-68, 32 (2.9%). Twenty-two of these cocoons contained living pupae, one contained a dead larva, and 31 had pupae that had been killed by a woodpecker (Waldbauer & Sternburg, 1970). Forty-one cocoons contained one foreign object, eight contained two, four contained three, and one contained four. The 54 cocoons contained 75 different objects: 26 unshelled sunflower seeds, 21 corn kernels, 11 unidentified pieces of nut meat, eight shelled sunflower seeds, two half peanut kernels, two whole acorns, two pieces of shelled acorn, one entire peanut kernel, one piece of Brazil nut, and one dead earthworm. All of these cocoons were in exposed positions on a twig or branch. One was on the branch of a shrub (*Cornus stolonifera*) at a height of 1.2 m. The rest were on the twigs or branches of trees—mostly *Acer saccharinum*, *Betula* spp., or *Malus* spp.—at an average height of approximately 2.38 m above the ground (range: 0.3 to 6.1 m).

With one exception, the objects were pushed through the valve of

the outer envelope into the space between the outer and inner envelopes [see Waldbauer & Sternburg (1967) for illustration]. The exception was a corn kernel pushed through a hole in the outer envelope at the end opposite the valve.

Several birds that occur in this vicinity are reported to insert seeds in crevices, knot holes, and other crannies: the bluejay (Bent, 1946), the white-breasted nuthatch (Bent, 1948), and the red-bellied and red-headed woodpeckers (Bent, 1939). However, only the bluejay is common in the urban environment in which we collected most of the cocoons.

We do not know how frequently blockage of the valve is sufficient to prevent the escape of the adult from the cocoon because we removed any foreign objects we noticed. A seed or two in a cocoon may have escaped our notice. Indeed, we often found sunflower seeds and corn kernels, apparently pushed out of the valve by emerging adults, at the bottom of our emergence cages. However, a blockage large enough to prevent the moth's exit has obviously escaped our notice only once. Eleven of the 54 cocoons mentioned above appeared to be sufficiently blocked to prevent emergence, but we do not know if this would have happened, either because we removed the objects or because the cocoon did not contain a living pupa.

#### LITERATURE CITED

- ANONYMOUS. 1870. Corn kernels in cocoons of cecropia moth. *Amer. Ent.* 2: 370.
- BENT, A. C. 1939. Life histories of North American woodpeckers. U. S. Nat. Mus. Bull. 174, 334 p.
- BENT, A. C. 1946. Life histories of North American jays, crows and titmice. U.S. Nat. Mus. Bull. 191, 495 p.
- BENT, A. C. 1948. Life histories of North American nuthatches, wrens, thrashers and their allies. U.S. Nat. Mus. Bull. 195, 475 p.
- LEBARON, W. 1870. Corn kernels in cocoon of cecropia moth. *Amer. Ent.* 2: 177.
- MINOT, C. S. 1870. Beech-nuts in cocoon of the cecropia. *Amer. Ent.* 2: 242.
- WALDBAUER, G. P. & J. G. STERNBURG. 1967. Differential predation on cocoons of *Hyalophora cecropia* (Lepidoptera: Saturniidae) spun on shrubs and trees. *Ecology* 48: 312-315.
- WALDBAUER, G. P. & J. G. STERNBURG. 1970. Hairy and downy woodpecker attacks on cocoons of urban *Hyalophora cecropia* and other saturniids (Lepidoptera). *Ann. Ent. Soc. Amer.* 63: 1366-1369.