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Seasonal Lipid Content of Bagworm Larvae^{1,2}

E. A. Heinrichs³

Department of Agricultural Biology, University of Tennessee Agricultural Experimental Station, Knoxville, Tennessee, USA

It is common knowledge to many who have attempted to control bagworms *Thyridopteryx* sp., that early instars are fairly easy to control, while later larval stages are less susceptible to insecticides. Studies of other insects (Bennett and Thomas 1963, Munson and Gottlieb 1953, Munson et al. 1954, Reier et al. 1953) have shown that as the lipid content increases, the susceptibility to insecticides (especially chlorinated hydrocarbons) decreases. To determine whether the lipid content of the bagworm larva increased with age a series of lipid extractions was conducted.

Methods and Materials

Larvae were collected from white pine, *Pinus strobus* L., on the University of Tennessee campus beginning July 5, 1967, when most of the larvae were in an early instar. Collections were terminated September 13, 1967, when many of the larvae had already pupated.

Lipid content was expressed as the total of ether-extractable material expressed as percentage of dry weight of the larva. From 4 to 20 larvae (sexes were not determined) were used for each lipid determination. Larvae were killed and weighed, then dried in an oven at 70°C for 24 hr and weighed again. Lipid was then extracted with ethyl ether in a Soxhlet extractor for 10 hr. After extraction, larvae were oven dried and weighed and percent lipid was calculated.

Results and Discussion

Lipid content was lowest on July 5 (Table 1). Lipid content increased only slightly from July 5 to July 27. However, it more than doubled (3.20–7.02%) in the month of August. Peak lipid content was reached September 13, just prior to pupation.

Table 1. Lipid and moisture content of bagworm larvae on various dates

Date lipid extracted	No. larvae	Percent	
		Lipid ^a	Moisture
July 5	10	1.32	82.02
12	20	1.45	83.37
19	15	1.45	83.18
27	10	1.51	83.26
August 2	15	3.20	80.17
8	15	4.90	77.54
16	16	5.28	77.22
23	15	6.15	76.81
30	15	7.02	74.12
September 13	4	9.55	73.81

a. Percentage of dry weight of larvae

The effect of lipid content on susceptibility of bagworm larvae to insecticides was not determined. However, if greater lipid content results in increased resistance to insecticides, the LD₅₀ would be expected to be much greater in September than in July.

Notes

1. Lepidoptera: Psychidae
2. Accepted for publication December 21, 1967
3. Assistant professor

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