

Gilbert L I. Lipid metabolism and function in insects.
Advan. Insect Physiol. 4:69-211, 1967. [Dept. Biological Sciences, Northwestern Univ., Evanston, IL]

This article reviews the field of insect lipids up to 1966 and may be in part responsible for the logarithmic increase in the number of studies on insect lipid metabolism and natural products chemistry over the ensuing decade. [The SC/® indicates that this paper has been cited over 200 times since 1967.]

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"The main objectives of my doctoral dissertation on the insect juvenile hormone, conducted in the 1950s under the direction of Howard Schneiderman at Cornell University, were: to develop a quantitative bioassay; to survey ether extracts of various insects and other invertebrates for juvenile hormone activity; and to attempt to purify this lipoidal hormone.¹ As a naive graduate student fresh from a four year stint in the US Navy, I knew very little about lipids and less about insects. A search of the literature in the area of insect lipids revealed to my amazement that other than quantification of total body lipid in an assortment of insects, very few data were available.

"During the course of those early studies, a sexual dimorphism in the lipid content of certain moths was noted, attributable to the energy requirements of the male in his search for sexual gratification.² This observation led to six more years of work at Northwestern University on flight muscle metabolism, lipid transport,³ etc.

"In 1964 I was awarded an NSF senior postdoctoral fellowship to work at the University of Bern (Switzerland) with the objec-

tive of investigating lipid metabolism in the termite. My first dissections of these minute digestive tracts encased in exoskeleton convinced me that my efforts for the year would be better served by analyzing the literature for an invited review on insect lipids, a project I had wanted to undertake since my first literature search ten years previously. By now, the last review of insect lipids was more than a decade out of date although several others appeared during the time required for this review. Much of the original data was from studies in my laboratory, particularly those of Drs. Chino, Domroese, and Goodfellow, and data from the bacterial and mammalian literature were included to promote interest in this infant field.

"Since I originally thought that the review would be of interest to only insect physiologists, I was astonished to learn that it has become a 'Citation Classic.' As an avid scanner of *Current Contents*® since its inception, I believed that a 'Citation Classic' was, for the most part, a paper that described a new and important technique or a flamboyant discovery. Alternatively, it could be a very poor paper that was the frequent object of criticism. Perhaps my review has gained its privileged status on the basis of the latter, although I prefer to believe that it was an insightful summation of the current status and future direction of a neglected field. I take real pleasure in learning that this review that required almost full-time labor for an entire year has proved useful to so many investigators. The last sentence of the review reads, 'Let us hope that more investigators will enter this most fertile area of research and that this review will become rapidly outdated.' Progress over the last decade in insect lipid metabolism and natural products chemistry indicates that both hopes have been fulfilled."^{4,5}

1. **Gilbert L I.** The chemistry and physiology of the juvenile hormone of insects. Unpublished thesis. Cornell University, Ithaca, NY. September 1953.
2. **Gilbert L I & Schneiderman H A.** The content of juvenile hormone and lipid in Lepidoptera: sexual differences and developmental changes. *Gen. Comp. Endocrinol.* 1:453-72, 1961.
3. **Chino H & Gilbert L I.** Diglyceride release from insect fat body: a possible means of lipid transport. *Science NY.* 143:359-61. 1964.
4. **Gilbert L I & Chino H.** Transport of lipids in insects. *J. Lipid Res.* 15:439-56, 1974.
5. **Gilbert L I, Goodman W & Bollenbacher W E.** The biochemistry of regulatory lipids in insects. *Biochemistry of Lipids II* (Goodwin T. ed). Baltimore. MD: University Park Press. 1977. p. 1-50.