

This Week's Citation Classic

CC/NUMBER 39
SEPTEMBER 27, 1982

Berger R S. Isolation, identification, and synthesis of the sex attractant of the cabbage looper, *Trichoplusia ni*. *Ann. Entomol. Soc. Amer.* 59:767-71, 1966.
[Department of Zoology-Entomology, Agricultural Experiment Station, Auburn University, Auburn, AL]

This paper describes the isolation and identification of *cis*-7-dodecen-1-ol acetate as the sex attractant of the female cabbage looper moth. The chemical structure of the compound was verified by synthesis and assay of synthetic attractant which was as active as the natural product. [This paper has been cited in over 125 publications since 1966. Based on SCI® data for 1961-82, it proved to be the most-cited paper ever published in this journal.]

R.S. Berger
Department of Zoology-Entomology
Auburn University
Auburn, AL 36849

August 23, 1982

"A sudden growth of interest in sex pheromones of insects occurred in the early-1960s as a direct result of mounting concerns over the impact that continued use of conventional insecticides might have on the environment. Alternate methods of insect control were wanted. The highly potent chemicals that insects produce to enable mates to locate one another (sex attractants, or sex pheromones, as they are now preferably called) were viewed as having great potential as agents that could be used to manipulate insects to their detriment.

"My initial work on the chemistry of the sex attractant of the cabbage looper female began while I was employed by the USDA at Brownsville, Texas.

Division policy, however, precluded me from continuing my work there, and was a major factor in my decision to leave the federal service in 1963 and accept a position at Auburn University. Knowledge of insect pheromone chemistry was very limited at that time. Results from only two studies had been reported.^{1,2} Fortunately, instrumentation and analytical methods, especially gas chromatography which has proved to be so useful in the study of insect pheromones, were advancing rapidly. But few compounds with structures similar to that of the pheromones were available to use as reference standards. These had to be synthesized or isolated from available mixtures. Then, as now, solvent impurities were a problem that had to be reckoned with.

"This paper is one of the initial works in a new field and probably received considerable recognition for that reason. The study involved an insect that is readily available, easy to rear and work with, and of importance as a crop pest to many investigators. I have often suspected that many of my colleagues have cited the paper as coconspirators against the system of science that seems to dictate that the individual working alone seldom accomplishes anything significant. Many papers are preempted soon after publication by more recent findings and developments and quickly pass from the active literature. The work on the cabbage looper sex attractant remained mostly unchallenged until 1980 when Bjostad et al.³ demonstrated an additional minor component to the pheromone. It is only justice that this group of investigators should be the ones to provide this amendment to the paper since, were it not for my prior publication, Gaston and Shorey would probably be the authors of this commentary."

1. Butenandt A, Beckmann R, Stamm D & Hecker E. Über den Sexual-Lockstoff des Seidenspinners *Bombyx mori*. Reindarstellung und Konstitution. *Z. Naturforsch. Sect. B* 14:283-4, 1959.
2. Jacobson M, Beroza M & Jones W A. Isolation, identification, and synthesis of the sex attractant of gypsy moth. *Science* 132:1011-12, 1960.
3. Bjostad L B, Gaston L K, Noble L L, Moyer I H & Shorey H H. Dodecyl acetate, a second pheromone component of the cabbage looper moth, *Trichoplusia ni*. *J. Chem. Ecol.* 6:727-34, 1980.