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This Week's Citation Classic

Slifer E H. The structure of arthropod chemoreceptors. *Annu. Rev. Entomol.* **15**:121-42, 1970.
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Emphasis in this review is on the minute pores or openings that penetrate the otherwise impermeable cuticle that covers insect chemoreceptors. It is through these pores that odors pass to stimulate the sensory neurons. [The *SCI*® indicates that this paper has been cited over 120 times since 1970.]

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"In 1953, while working at the Marine Biological Laboratory on an entirely different problem, I accidentally discovered that a solution of acid fuchsin will stain red the tips of the long sensory hairs on the antenna of an intact grasshopper. This was a complete surprise. For years in my lectures to the entomology class at the University of Iowa I had pointed out that it was not known how odors reached the sensory nerves through the impermeable cuticle. I dropped all other research and have concentrated on that problem, with rare diversions, ever since. After I had studied the structure and distribution of the hairs, as well as others associated with them and the behavior of grasshoppers to odors, the zoology department at Iowa acquired an electron microscope in the middle 1950s. This new instrument provided the opportunity to examine the fine structure of the various hairs. The occurrence of pores in the walls of several kinds of sensory structures was soon confirmed.

"By this time I had acquired a severe allergy to grasshoppers — a fairly common event among those who work with these insects — and so decided to see whether the pores could be demonstrated in other insects to which I was not sensitive. So a few species from each order were examined. That work has recently been completed and it has been found that hairs with pores are present in all.

"While at the University of Iowa I was greatly helped by the collaboration of H.W. Beams, J.J. Prestage, and S.S. Sekhon. The last has continued to work with me even though we are presently located 3,000 miles apart. Sekhon moved to the West Coast after leaving Iowa and I to the East Coast upon retirement. Without Sekhon's long-continued help the work would have been greatly handicapped. The Academy of Natural Sciences in Philadelphia has provided me with the means to continue my work for the past 14 years.

"My *Annual Review* paper was published at a most favorable time for attracting attention. Many persons were alarmed by the harmful effect of insecticides on man and the environment and a search had begun for natural means to control pest insects. The use of attractive and repellant odors led, naturally, to interest in the means by which they were perceived by the insect. This accounts for the attention given to the paper. (It could also be cited as an example of where unplanned research may lead!)

"The field has recently been reviewed by R.Y. Zacharuk of the University of Regina in Canada."[1]

1. **Zacharuk R Y.** Ultrastructure and function of insect chemosensilla. *Annu. Rev. Entomol.* **25**:27-47, 1979.