Coeloconic Sensilla on the Antennae of the Yellow Fever Mosquito, *Aedes aegypti* (L.)¹

Of the investigators to examine closely the sensory structures on the antennal flagellum of culicine mosquitoes²⁻¹¹ none found coeloconic sensilla, pegs sunken in pits, whereas these organs are frequent on anopheline antennae^{5,7,12}. Evidence from fine structure studies presented herein reports the existence of inconspicuous sensilla coeloconica on the antennae of female *Aedes aegypti* (L.), demonstrating that both subfamilies of the Culicidae have such sensory structures.

Materials and methods. Antennae of female *A. aegypti* were fixed overnight in Karnovsky's fixative¹³, washed in 0.05 M Sorenson's 10% sucrose buffer, pH 7, and post fixed in 1% OsO₄ in veronal acetate buffer. The tissue was dehydrated through ethanol, embedded in Spurr's epoxy medium¹⁴, and stained with uranyl acetate and lead citrate.

Results. In sections of flagellar segment 12, just proximal to terminal segment 13, a typical coeloconic sensillum was observed (Figure). The peg, which is approximately 2.5 µm long and tapers from a base 1.4 µm in diameter to a tip 0.35 µm in diameter, is set in a pit with an opening slightly less than 1 µm. Coeloconic sensilla on anopheline antennae are several times larger than the one described here. A cuticular sheath encases the dendrite(s) and foldings of the tormogen cell membrane occur around the cuticularized pit.

Of the investigations on the antennal sensory structures of female *A. aegypti*^{4,6-8}, only one⁸ reported the existence of small, spherical structures with hyaline properties on flagellar segments 1, 10 and 12. These structures were called campaniform organs and when similar sensilla were observed on the antennae of a variety of *Culex* species⁹⁻¹¹, usage of the same term was continued. However, it is probable that the coeloconic type of sensillum reported in this paper is the 'campaniform organ' which was originally misidentified due to the limitations of the light

microscope in observing such small structures. This conclusion is substantiated by finding the coeloconic sensillum in the same area of the flagellum as reported for the campaniform organ⁸. Furthermore, upon subsequent light microscope investigations by ourselves, we did not observe any irregularity of the cuticle in the region of the coeloconic sensillum other than that associated with the 'campaniform organ' which would account for the presence of the coeloconic sensillum.

Coeloconic sensilla have been shown electrophysiologically to have several functions. On *Apis mellifera* they contain neurons which respond to carbon dioxide and temperature and/or humidity¹⁵. Certain coeloconic sensilla on *Locustra migratoria* are sensitive to leaf extracts while others respond to temperature and humidity¹⁶⁻¹⁸. Although the function of the coeloconic sensilla on *A. aegypti* is not known, their existence is of consequence in the understanding of mosquito behavior, especially with regards to the increasing interest in the function of mosquito sensory receptors in perceiving attractants and repellents¹⁹⁻²².

Zusammenfassung. Elektronenoptischer Nachweis von Sensilla coeloconica bei *Aedes aegypti*-«Weibchen» was beweist, dass nicht nur Culicinae, sondern auch Anophelinae Sinnesstrukturen besitzen.

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Section through flagellar segment 12 of female *Aedes aegypti* showing coeloconic sensillum. ×64,000.

- ¹ Supported by Medical Research Council Grant No. MA 2909.
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